

CSR axioms

CSR001+0.ax Standard discrete event calculus axioms

$\forall \text{time}_1, \text{fluent}, \text{time}_2: (\text{stoppedIn}(\text{time}_1, \text{fluent}, \text{time}_2) \iff \exists \text{event}, \text{time}: (\text{happens}(\text{event}, \text{time}) \text{ and } \text{less}(\text{time}_1, \text{time}) \text{ and } \text{less}(\text{time}_2, \text{time})))$
 $\forall \text{time}_1, \text{time}_2, \text{fluent}: (\text{startedIn}(\text{time}_1, \text{fluent}, \text{time}_2) \iff \exists \text{event}, \text{time}: (\text{happens}(\text{event}, \text{time}) \text{ and } \text{less}(\text{time}_1, \text{time}) \text{ and } \text{less}(\text{time}_2, \text{time})))$
 $\forall \text{event}, \text{time}, \text{fluent}, \text{fluent}_2, \text{offset}: ((\text{happens}(\text{event}, \text{time}) \text{ and } \text{initiates}(\text{event}, \text{fluent}, \text{time}) \text{ and } \text{less}(n_0, \text{offset}) \text{ and } \text{trajectory}(\text{fluent}_2, \text{time} + \text{offset})) \Rightarrow \text{holdsAt}(\text{fluent}_2, \text{time} + \text{offset})) \quad \text{fof}(\text{change_holding}, \text{axiom})$
 $\forall \text{event}, \text{time}_1, \text{fluent}_1, \text{time}_2, \text{fluent}_2: ((\text{happens}(\text{event}, \text{time}_1) \text{ and } \text{terminates}(\text{event}, \text{fluent}_1, \text{time}_1) \text{ and } \text{less}(n_0, \text{time}_2) \text{ and } \text{antitrajectory}(\text{fluent}_2, \text{time}_1 + \text{time}_2)) \Rightarrow \text{holdsAt}(\text{fluent}_2, \text{time}_1 + \text{time}_2)) \quad \text{fof}(\text{antitrajectory}, \text{axiom})$
 $\forall \text{fluent}, \text{time}: ((\text{holdsAt}(\text{fluent}, \text{time}) \text{ and } \neg \text{releasedAt}(\text{fluent}, \text{time} + n_1) \text{ and } \neg \exists \text{event}: (\text{happens}(\text{event}, \text{time}) \text{ and } \text{terminates}(\text{event}, \text{fluent}, \text{time}))) \Rightarrow \text{holdsAt}(\text{fluent}, \text{time} + n_1)) \quad \text{fof}(\text{keep_holding}, \text{axiom})$
 $\forall \text{fluent}, \text{time}: ((\neg \text{holdsAt}(\text{fluent}, \text{time}) \text{ and } \neg \text{releasedAt}(\text{fluent}, \text{time} + n_1) \text{ and } \neg \exists \text{event}: (\text{happens}(\text{event}, \text{time}) \text{ and } \text{initiates}(\text{event}, \text{fluent}, \text{time}))) \Rightarrow \neg \text{holdsAt}(\text{fluent}, \text{time} + n_1)) \quad \text{fof}(\text{keep_not_holding}, \text{axiom})$
 $\forall \text{fluent}, \text{time}: ((\text{releasedAt}(\text{fluent}, \text{time}) \text{ and } \neg \exists \text{event}: (\text{happens}(\text{event}, \text{time}) \text{ and } (\text{initiates}(\text{event}, \text{fluent}, \text{time}) \text{ or } \text{terminates}(\text{event}, \text{fluent}, \text{time})))) \Rightarrow \text{releasedAt}(\text{fluent}, \text{time} + n_1)) \quad \text{fof}(\text{keep_released}, \text{axiom})$
 $\forall \text{fluent}, \text{time}: ((\neg \text{releasedAt}(\text{fluent}, \text{time}) \text{ and } \neg \exists \text{event}: (\text{happens}(\text{event}, \text{time}) \text{ and } \text{releases}(\text{event}, \text{fluent}, \text{time})))) \Rightarrow \neg \text{releasedAt}(\text{fluent}, \text{time} + n_1)) \quad \text{fof}(\text{keep_not_released}, \text{axiom})$
 $\forall \text{event}, \text{time}, \text{fluent}: ((\text{happens}(\text{event}, \text{time}) \text{ and } \text{initiates}(\text{event}, \text{fluent}, \text{time})) \Rightarrow \text{holdsAt}(\text{fluent}, \text{time} + n_1)) \quad \text{fof}(\text{happens_initiates}, \text{axiom})$
 $\forall \text{event}, \text{time}, \text{fluent}: ((\text{happens}(\text{event}, \text{time}) \text{ and } \text{terminates}(\text{event}, \text{fluent}, \text{time})) \Rightarrow \neg \text{holdsAt}(\text{fluent}, \text{time} + n_1)) \quad \text{fof}(\text{happens_terminates}, \text{axiom})$
 $\forall \text{event}, \text{time}, \text{fluent}: ((\text{happens}(\text{event}, \text{time}) \text{ and } \text{releases}(\text{event}, \text{fluent}, \text{time})) \Rightarrow \text{releasedAt}(\text{fluent}, \text{time} + n_1)) \quad \text{fof}(\text{happens_releases}, \text{axiom})$
 $\forall \text{event}, \text{time}, \text{fluent}: ((\text{happens}(\text{event}, \text{time}) \text{ and } (\text{initiates}(\text{event}, \text{fluent}, \text{time}) \text{ or } \text{terminates}(\text{event}, \text{fluent}, \text{time}))) \Rightarrow \neg \text{releasedAt}(\text{fluent}, \text{time} + n_1)) \quad \text{fof}(\text{happens_not_released}, \text{axiom})$

CSR001+1.ax Kitchen sink scenario

$\forall \text{event}, \text{fluent}, \text{time}: (\text{initiates}(\text{event}, \text{fluent}, \text{time}) \iff ((\text{event} = \text{tapOn} \text{ and } \text{fluent} = \text{filling}) \text{ or } (\text{event} = \text{overflow} \text{ and } \text{fluent} = \text{spilling}) \text{ or } \exists \text{height}: (\text{holdsAt}(\text{waterLevel}(\text{height}), \text{time}) \text{ and } \text{event} = \text{tapOff} \text{ and } \text{fluent} = \text{waterLevel}(\text{height})) \text{ or } \exists \text{height}: (\text{holdsAt}(\text{waterLevel}(\text{height}), \text{time}) \text{ and } \text{event} = \text{overflow} \text{ and } \text{fluent} = \text{waterLevel}(\text{height})))) \quad \text{fof}(\text{initiates_all_defn}, \text{axiom})$
 $\forall \text{event}, \text{fluent}, \text{time}: (\text{terminates}(\text{event}, \text{fluent}, \text{time}) \iff ((\text{event} = \text{tapOff} \text{ and } \text{fluent} = \text{filling}) \text{ or } (\text{event} = \text{overflow} \text{ and } \text{fluent} = \text{spilling}))) \quad \text{fof}(\text{terminates_all_defn}, \text{axiom})$
 $\forall \text{event}, \text{fluent}, \text{time}: (\text{releases}(\text{event}, \text{fluent}, \text{time}) \iff \exists \text{height}: (\text{event} = \text{tapOn} \text{ and } \text{fluent} = \text{waterLevel}(\text{height}))) \quad \text{fof}(\text{releases_all_defn}, \text{axiom})$
 $\forall \text{event}, \text{time}: (\text{happens}(\text{event}, \text{time}) \iff ((\text{event} = \text{tapOn} \text{ and } \text{time} = n_0) \text{ or } (\text{holdsAt}(\text{waterLevel}(n_3), \text{time}) \text{ and } \text{holdsAt}(\text{waterLevel}(n_3), \text{time}) \text{ and } \text{event} = \text{overflow}))) \quad \text{fof}(\text{happens_all_defn}, \text{axiom})$
 $\forall \text{height}_1, \text{time}, \text{height}_2, \text{offset}: ((\text{holdsAt}(\text{waterLevel}(\text{height}_1), \text{time}) \text{ and } \text{height}_2 = \text{height}_1 + \text{offset}) \Rightarrow \text{trajectory}(\text{filling}, \text{time}, \text{height}_1, \text{height}_2)) \quad \text{fof}(\text{trajectory_filling}, \text{axiom})$
 $\forall \text{time}, \text{height}_1, \text{height}_2: ((\text{holdsAt}(\text{waterLevel}(\text{height}_1), \text{time}) \text{ and } \text{holdsAt}(\text{waterLevel}(\text{height}_2), \text{time})) \Rightarrow \text{height}_1 = \text{height}_2) \quad \text{fof}(\text{same_waterLevel}, \text{axiom})$
 $\text{tapOff} \neq \text{tapOn} \quad \text{fof}(\text{tapOff_not_tapOn}, \text{axiom})$
 $\text{tapOff} \neq \text{overflow} \quad \text{fof}(\text{tapOff_not_overflow}, \text{axiom})$
 $\text{overflow} \neq \text{tapOn} \quad \text{fof}(\text{overflow_not_tapOn}, \text{axiom})$
 $\forall x: \text{filling} \neq \text{waterLevel}(x) \quad \text{fof}(\text{filling_not_waterLevel}, \text{axiom})$
 $\forall x: \text{spilling} \neq \text{waterLevel}(x) \quad \text{fof}(\text{spilling_not_waterLevel}, \text{axiom})$
 $\text{filling} \neq \text{spilling} \quad \text{fof}(\text{filling_not_spilling}, \text{axiom})$
 $\forall x, y: (\text{waterLevel}(x) = \text{waterLevel}(y) \iff x = y) \quad \text{fof}(\text{distinct_waterLevels}, \text{axiom})$

CSR001+2.ax Supermarket trolley scenario

$\forall \text{event}, \text{fluent}, \text{time}: (\text{initiates}(\text{event}, \text{fluent}, \text{time}) \iff ((\text{event} = \text{push} \text{ and } \text{fluent} = \text{forwards} \text{ and } \neg \text{happens}(\text{pull}, \text{time})) \text{ or } (\text{event} = \text{pull} \text{ and } \text{fluent} = \text{backwards} \text{ and } \neg \text{happens}(\text{push}, \text{time})) \text{ or } (\text{event} = \text{pull} \text{ and } \text{fluent} = \text{spinning} \text{ and } \text{happens}(\text{push}, \text{time})))) \quad \text{fof}(\text{initiates_all_defn}, \text{axiom})$
 $\forall \text{event}, \text{fluent}, \text{time}: (\text{terminates}(\text{event}, \text{fluent}, \text{time}) \iff ((\text{event} = \text{push} \text{ and } \text{fluent} = \text{backwards} \text{ and } \neg \text{happens}(\text{pull}, \text{time})) \text{ or } (\text{event} = \text{push} \text{ and } \text{fluent} = \text{forwards} \text{ and } \neg \text{happens}(\text{push}, \text{time})) \text{ or } (\text{event} = \text{pull} \text{ and } \text{fluent} = \text{forwards} \text{ and } \text{happens}(\text{push}, \text{time})) \text{ or } (\text{event} = \text{pull} \text{ and } \text{fluent} = \text{backwards} \text{ and } \text{happens}(\text{push}, \text{time})) \text{ or } (\text{event} = \text{push} \text{ and } \text{fluent} = \text{spinning} \text{ and } \neg \text{happens}(\text{pull}, \text{time})) \text{ or } (\text{event} = \text{pull} \text{ and } \text{fluent} = \text{spinning} \text{ and } \neg \text{happens}(\text{push}, \text{time})))) \quad \text{fof}(\text{terminates_all_defn}, \text{axiom})$
 $\forall \text{event}, \text{fluent}, \text{time}: \neg \text{releases}(\text{event}, \text{fluent}, \text{time}) \quad \text{fof}(\text{releases_all_defn}, \text{axiom})$
 $\forall \text{event}, \text{time}: (\text{happens}(\text{event}, \text{time}) \iff ((\text{event} = \text{push} \text{ and } \text{time} = n_0) \text{ or } (\text{event} = \text{pull} \text{ and } \text{time} = n_1) \text{ or } (\text{event} = \text{pull} \text{ and } \text{time} = n_2) \text{ or } (\text{event} = \text{push} \text{ and } \text{time} = n_2))) \quad \text{fof}(\text{happens_all_defn}, \text{axiom})$
 $\text{push} \neq \text{pull} \quad \text{fof}(\text{push_not_pull}, \text{axiom})$
 $\text{forwards} \neq \text{backwards} \quad \text{fof}(\text{forwards_not_backwards}, \text{axiom})$
 $\text{forwards} \neq \text{spinning} \quad \text{fof}(\text{forwards_not_spinning}, \text{axiom})$
 $\text{spinning} \neq \text{backwards} \quad \text{fof}(\text{spinning_not_backwards}, \text{axiom})$

CSR001+3.ax Supermarket trolley scenario for multiple trolleys

$\forall \text{event, fluent, time: } (\text{initiates}(\text{event, fluent, time}) \iff \exists \text{agent, trolley: } ((\text{event} = \text{push}(\text{agent, trolley}) \text{ and } \text{fluent} = \text{forwards}(\text{trolley}) \text{ and } \neg \text{happens}(\text{pull}(\text{agent, trolley}), \text{time})) \text{ or } (\text{event} = \text{pull}(\text{agent, trolley}) \text{ and } \text{fluent} = \text{backwards}(\text{trolley}) \text{ and } \text{pull}(\text{agent, trolley}) \text{ and } \text{fluent} = \text{spinning}(\text{trolley}) \text{ and } \text{happens}(\text{push}(\text{agent, trolley}), \text{time})))$ fof(initiates_all_defn, axiom)
 $\forall \text{event, fluent, time: } (\text{terminates}(\text{event, fluent, time}) \iff \exists \text{agent, trolley: } ((\text{event} = \text{push}(\text{agent, trolley}) \text{ and } \text{fluent} = \text{backwards}(\text{trolley}) \text{ and } \neg \text{happens}(\text{pull}(\text{agent, trolley}), \text{time})) \text{ or } (\text{event} = \text{pull}(\text{agent, trolley}) \text{ and } \text{fluent} = \text{forwards}(\text{trolley}) \text{ and } \text{pull}(\text{agent, trolley}) \text{ and } \text{fluent} = \text{forwards}(\text{trolley}) \text{ and } \text{happens}(\text{push}(\text{agent, trolley}), \text{time})) \text{ or } (\text{event} = \text{pull}(\text{agent, trolley}) \text{ and } \text{fluent} = \text{backwards}(\text{trolley}) \text{ and } \text{happens}(\text{push}(\text{agent, trolley}), \text{time})) \text{ or } (\text{event} = \text{push}(\text{agent, trolley}) \text{ and } \text{fluent} = \text{spinning}(\text{trolley}) \text{ and } \text{pull}(\text{agent, trolley}) \text{ and } \text{fluent} = \text{spinning}(\text{trolley}) \text{ and } \neg \text{happens}(\text{push}(\text{agent, trolley}), \text{time})))$ fof(terminates_all_defn, axiom)
 $\forall \text{event, fluent, time: } \neg \text{releases}(\text{event, fluent, time})$ fof(releases_all_defn, axiom)
 $\forall \text{agent, trolley: } \text{push}(\text{agent, trolley}) \neq \text{pull}(\text{agent, trolley})$ fof(push_not_pull, axiom)
 $\forall \text{agent}_1, \text{agent}_2, \text{trolley}_1, \text{trolley}_2: ((\text{agent}_1 \neq \text{agent}_2 \text{ and } \text{trolley}_1 \neq \text{trolley}_2) \Rightarrow \text{push}(\text{agent}_1, \text{trolley}_1) \neq \text{push}(\text{agent}_2, \text{trolley}_2))$
 $\forall \text{agent}_1, \text{agent}_2, \text{trolley}_1, \text{trolley}_2: ((\text{agent}_1 \neq \text{agent}_2 \text{ and } \text{trolley}_1 \neq \text{trolley}_2) \Rightarrow \text{pull}(\text{agent}_1, \text{trolley}_1) \neq \text{pull}(\text{agent}_2, \text{trolley}_2))$
 $\forall \text{trolley: } \text{forwards}(\text{trolley}) \neq \text{backwards}(\text{trolley})$ fof(forwards_not_backwards, axiom)
 $\forall \text{trolley: } \text{forwards}(\text{trolley}) \neq \text{spinning}(\text{trolley})$ fof(forwards_not_spinning, axiom)
 $\forall \text{trolley: } \text{spinning}(\text{trolley}) \neq \text{backwards}(\text{trolley})$ fof(spinning_not_backwards, axiom)

CSR002+0.ax 0 axioms from Cyc

CSR problems

CSR001+1.p Water level is 3 at time 4

include('Axioms/CSR001+0.ax')
include('Axioms/CSR001+1.ax')
 $n_0 + n_0 = n_0$ fof(plus0_0, axiom)
 $n_0 + n_1 = n_1$ fof(plus0_1, axiom)
 $n_0 + n_2 = n_2$ fof(plus0_2, axiom)
 $n_0 + n_3 = n_3$ fof(plus0_3, axiom)
 $n_1 + n_1 = n_2$ fof(plus1_1, axiom)
 $n_1 + n_2 = n_3$ fof(plus1_2, axiom)
 $n_1 + n_3 = n_4$ fof(plus1_3, axiom)
 $n_2 + n_2 = n_4$ fof(plus2_2, axiom)
 $n_2 + n_3 = n_5$ fof(plus2_3, axiom)
 $n_3 + n_3 = n_6$ fof(plus3_3, axiom)
 $\forall x, y: x + y = y + x$ fof(symmetry_of_plus, axiom)
 $\forall x, y: (x \leq y \iff (\text{less}(x, y) \text{ or } x = y))$ fof(less_or_equal, axiom)
 $\neg \exists x: \text{less}(x, n_0)$ fof(less0, axiom)
 $\forall x: (\text{less}(x, n_1) \iff x \leq n_0)$ fof(less1, axiom)
 $\forall x: (\text{less}(x, n_2) \iff x \leq n_1)$ fof(less2, axiom)
 $\forall x: (\text{less}(x, n_3) \iff x \leq n_2)$ fof(less3, axiom)
 $\forall x: (\text{less}(x, n_4) \iff x \leq n_3)$ fof(less4, axiom)
 $\forall x: (\text{less}(x, n_5) \iff x \leq n_4)$ fof(less5, axiom)
 $\forall x: (\text{less}(x, n_6) \iff x \leq n_5)$ fof(less6, axiom)
 $\forall x: (\text{less}(x, n_7) \iff x \leq n_6)$ fof(less7, axiom)
 $\forall x: (\text{less}(x, n_8) \iff x \leq n_7)$ fof(less8, axiom)
 $\forall x: (\text{less}(x, n_9) \iff x \leq n_8)$ fof(less9, axiom)
 $\forall x, y: (\text{less}(x, y) \iff (\neg \text{less}(y, x) \text{ and } y \neq x))$ fof(less_property, axiom)
holdsAt(waterLevel(n_0), n_0) fof(waterLevel_0, hypothesis)
 $\neg \text{holdsAt}(\text{filling}, n_0)$ fof(not_filling_0, hypothesis)
 $\neg \text{holdsAt}(\text{spilling}, n_0)$ fof(not_spilling_0, hypothesis)
 $\forall \text{height: } \neg \text{releasedAt}(\text{waterLevel}(\text{height}), n_0)$ fof(not_released_waterLevel_0, hypothesis)
 $\neg \text{releasedAt}(\text{filling}, n_0)$ fof(not_released_filling_0, hypothesis)
 $\neg \text{releasedAt}(\text{spilling}, n_0)$ fof(not_released_spilling_0, hypothesis)
holdsAt(waterLevel(n_3), n_4) fof(waterLevel_4, conjecture)

CSR001+2.p Water level is 3 at time 4

include('Axioms/CSR001+0.ax')
include('Axioms/CSR001+1.ax')
 $n_0 + n_0 = n_0$ fof(plus0_0, axiom)
 $n_0 + n_1 = n_1$ fof(plus0_1, axiom)
 $n_0 + n_2 = n_2$ fof(plus0_2, axiom)

$n_0 + n_3 = n_3$ fof(plus0₃, axiom)
 $n_1 + n_1 = n_2$ fof(plus1₁, axiom)
 $n_1 + n_2 = n_3$ fof(plus1₂, axiom)
 $n_1 + n_3 = n_4$ fof(plus1₃, axiom)
 $n_2 + n_2 = n_4$ fof(plus2₂, axiom)
 $n_2 + n_3 = n_5$ fof(plus2₃, axiom)
 $n_3 + n_3 = n_6$ fof(plus3₃, axiom)
 $\forall x, y: x + y = y + x$ fof(symmetry_of_plus, axiom)
 $\forall x, y: (x \leq y \iff (\text{less}(x, y) \text{ or } x = y))$ fof(less_or_equal, axiom)
 $\neg \exists x: \text{less}(x, n_0)$ fof(less₀, axiom)
 $\forall x: (\text{less}(x, n_1) \iff x \leq n_0)$ fof(less₁, axiom)
 $\forall x: (\text{less}(x, n_2) \iff x \leq n_1)$ fof(less₂, axiom)
 $\forall x: (\text{less}(x, n_3) \iff x \leq n_2)$ fof(less₃, axiom)
 $\forall x: (\text{less}(x, n_4) \iff x \leq n_3)$ fof(less₄, axiom)
 $\forall x: (\text{less}(x, n_5) \iff x \leq n_4)$ fof(less₅, axiom)
 $\forall x: (\text{less}(x, n_6) \iff x \leq n_5)$ fof(less₆, axiom)
 $\forall x: (\text{less}(x, n_7) \iff x \leq n_6)$ fof(less₇, axiom)
 $\forall x: (\text{less}(x, n_8) \iff x \leq n_7)$ fof(less₈, axiom)
 $\forall x: (\text{less}(x, n_9) \iff x \leq n_8)$ fof(less₉, axiom)
 $\forall x, y: (\text{less}(x, y) \iff (\neg \text{less}(y, x) \text{ and } y \neq x))$ fof(less_property, axiom)
holdsAt(waterLevel(n_0), n_0) fof(waterLevel₀, hypothesis)
 \neg holdsAt(filling, n_0) fof(not_filling₀, hypothesis)
 \neg holdsAt(spilling, n_0) fof(not_spilling₀, hypothesis)
 \forall height: \neg releasedAt(waterLevel(height), n_0) fof(not_released_waterLevel₀, hypothesis)
 \neg releasedAt(filling, n_0) fof(not_released_filling₀, hypothesis)
 \neg releasedAt(spilling, n_0) fof(not_released_spilling₀, hypothesis)
holdsAt(waterLevel(n_3), n_3) fof(waterLevel₃, lemma)
holdsAt(waterLevel(n_3), n_4) fof(waterLevel₄, conjecture)

CSR002+1.p Not filling at time 4

include('Axioms/CSR001+0.ax')
include('Axioms/CSR001+1.ax')
 $n_0 + n_0 = n_0$ fof(plus0₀, axiom)
 $n_0 + n_1 = n_1$ fof(plus0₁, axiom)
 $n_0 + n_2 = n_2$ fof(plus0₂, axiom)
 $n_0 + n_3 = n_3$ fof(plus0₃, axiom)
 $n_1 + n_1 = n_2$ fof(plus1₁, axiom)
 $n_1 + n_2 = n_3$ fof(plus1₂, axiom)
 $n_1 + n_3 = n_4$ fof(plus1₃, axiom)
 $n_2 + n_2 = n_4$ fof(plus2₂, axiom)
 $n_2 + n_3 = n_5$ fof(plus2₃, axiom)
 $n_3 + n_3 = n_6$ fof(plus3₃, axiom)
 $\forall x, y: x + y = y + x$ fof(symmetry_of_plus, axiom)
 $\forall x, y: (x \leq y \iff (\text{less}(x, y) \text{ or } x = y))$ fof(less_or_equal, axiom)
 $\neg \exists x: \text{less}(x, n_0)$ fof(less₀, axiom)
 $\forall x: (\text{less}(x, n_1) \iff x \leq n_0)$ fof(less₁, axiom)
 $\forall x: (\text{less}(x, n_2) \iff x \leq n_1)$ fof(less₂, axiom)
 $\forall x: (\text{less}(x, n_3) \iff x \leq n_2)$ fof(less₃, axiom)
 $\forall x: (\text{less}(x, n_4) \iff x \leq n_3)$ fof(less₄, axiom)
 $\forall x: (\text{less}(x, n_5) \iff x \leq n_4)$ fof(less₅, axiom)
 $\forall x: (\text{less}(x, n_6) \iff x \leq n_5)$ fof(less₆, axiom)
 $\forall x: (\text{less}(x, n_7) \iff x \leq n_6)$ fof(less₇, axiom)
 $\forall x: (\text{less}(x, n_8) \iff x \leq n_7)$ fof(less₈, axiom)
 $\forall x: (\text{less}(x, n_9) \iff x \leq n_8)$ fof(less₉, axiom)
 $\forall x, y: (\text{less}(x, y) \iff (\neg \text{less}(y, x) \text{ and } y \neq x))$ fof(less_property, axiom)
holdsAt(waterLevel(n_0), n_0) fof(waterLevel₀, hypothesis)
 \neg holdsAt(filling, n_0) fof(not_filling₀, hypothesis)
 \neg holdsAt(spilling, n_0) fof(not_spilling₀, hypothesis)
 \forall height: \neg releasedAt(waterLevel(height), n_0) fof(not_released_waterLevel₀, hypothesis)
 \neg releasedAt(filling, n_0) fof(not_released_filling₀, hypothesis)

$\neg \text{releasedAt}(\text{spilling}, n_0)$ $\text{fof}(\text{not_released_spilling}_0, \text{hypothesis})$
 $\neg \text{holdsAt}(\text{filling}, n_4)$ $\text{fof}(\text{not_filling}_4, \text{conjecture})$

CSR002+2.p Not filling at time 4

$\text{include}(\text{'Axioms/CSR001+0.ax'})$

$\text{include}(\text{'Axioms/CSR001+1.ax'})$

$n_0 + n_0 = n_0$ $\text{fof}(\text{plus0}_0, \text{axiom})$

$n_0 + n_1 = n_1$ $\text{fof}(\text{plus0}_1, \text{axiom})$

$n_0 + n_2 = n_2$ $\text{fof}(\text{plus0}_2, \text{axiom})$

$n_0 + n_3 = n_3$ $\text{fof}(\text{plus0}_3, \text{axiom})$

$n_1 + n_1 = n_2$ $\text{fof}(\text{plus1}_1, \text{axiom})$

$n_1 + n_2 = n_3$ $\text{fof}(\text{plus1}_2, \text{axiom})$

$n_1 + n_3 = n_4$ $\text{fof}(\text{plus1}_3, \text{axiom})$

$n_2 + n_2 = n_4$ $\text{fof}(\text{plus2}_2, \text{axiom})$

$n_2 + n_3 = n_5$ $\text{fof}(\text{plus2}_3, \text{axiom})$

$n_3 + n_3 = n_6$ $\text{fof}(\text{plus3}_3, \text{axiom})$

$\forall x, y: x + y = y + x$ $\text{fof}(\text{symmetry_of_plus}, \text{axiom})$

$\forall x, y: (x \leq y \iff (\text{less}(x, y) \text{ or } x = y))$ $\text{fof}(\text{less_or_equal}, \text{axiom})$

$\neg \exists x: \text{less}(x, n_0)$ $\text{fof}(\text{less}_0, \text{axiom})$

$\forall x: (\text{less}(x, n_1) \iff x \leq n_0)$ $\text{fof}(\text{less}_1, \text{axiom})$

$\forall x: (\text{less}(x, n_2) \iff x \leq n_1)$ $\text{fof}(\text{less}_2, \text{axiom})$

$\forall x: (\text{less}(x, n_3) \iff x \leq n_2)$ $\text{fof}(\text{less}_3, \text{axiom})$

$\forall x: (\text{less}(x, n_4) \iff x \leq n_3)$ $\text{fof}(\text{less}_4, \text{axiom})$

$\forall x: (\text{less}(x, n_5) \iff x \leq n_4)$ $\text{fof}(\text{less}_5, \text{axiom})$

$\forall x: (\text{less}(x, n_6) \iff x \leq n_5)$ $\text{fof}(\text{less}_6, \text{axiom})$

$\forall x: (\text{less}(x, n_7) \iff x \leq n_6)$ $\text{fof}(\text{less}_7, \text{axiom})$

$\forall x: (\text{less}(x, n_8) \iff x \leq n_7)$ $\text{fof}(\text{less}_8, \text{axiom})$

$\forall x: (\text{less}(x, n_9) \iff x \leq n_8)$ $\text{fof}(\text{less}_9, \text{axiom})$

$\forall x, y: (\text{less}(x, y) \iff (\neg \text{less}(y, x) \text{ and } y \neq x))$ $\text{fof}(\text{less_property}, \text{axiom})$

$\text{holdsAt}(\text{waterLevel}(n_0), n_0)$ $\text{fof}(\text{waterLevel}_0, \text{hypothesis})$

$\neg \text{holdsAt}(\text{filling}, n_0)$ $\text{fof}(\text{not_filling}_0, \text{hypothesis})$

$\neg \text{holdsAt}(\text{spilling}, n_0)$ $\text{fof}(\text{not_spilling}_0, \text{hypothesis})$

$\forall \text{height}: \neg \text{releasedAt}(\text{waterLevel}(\text{height}), n_0)$ $\text{fof}(\text{not_released_waterLevel}_0, \text{hypothesis})$

$\neg \text{releasedAt}(\text{filling}, n_0)$ $\text{fof}(\text{not_released_filling}_0, \text{hypothesis})$

$\neg \text{releasedAt}(\text{spilling}, n_0)$ $\text{fof}(\text{not_released_spilling}_0, \text{hypothesis})$

$\text{holdsAt}(\text{waterLevel}(n_3), n_3)$ $\text{fof}(\text{waterLevel}_3, \text{lemma})$

$\neg \text{holdsAt}(\text{filling}, n_4)$ $\text{fof}(\text{not_filling}_4, \text{conjecture})$

CSR003+1.p Spilling at time 4

$\text{include}(\text{'Axioms/CSR001+0.ax'})$

$\text{include}(\text{'Axioms/CSR001+1.ax'})$

$n_0 + n_0 = n_0$ $\text{fof}(\text{plus0}_0, \text{axiom})$

$n_0 + n_1 = n_1$ $\text{fof}(\text{plus0}_1, \text{axiom})$

$n_0 + n_2 = n_2$ $\text{fof}(\text{plus0}_2, \text{axiom})$

$n_0 + n_3 = n_3$ $\text{fof}(\text{plus0}_3, \text{axiom})$

$n_1 + n_1 = n_2$ $\text{fof}(\text{plus1}_1, \text{axiom})$

$n_1 + n_2 = n_3$ $\text{fof}(\text{plus1}_2, \text{axiom})$

$n_1 + n_3 = n_4$ $\text{fof}(\text{plus1}_3, \text{axiom})$

$n_2 + n_2 = n_4$ $\text{fof}(\text{plus2}_2, \text{axiom})$

$n_2 + n_3 = n_5$ $\text{fof}(\text{plus2}_3, \text{axiom})$

$n_3 + n_3 = n_6$ $\text{fof}(\text{plus3}_3, \text{axiom})$

$\forall x, y: x + y = y + x$ $\text{fof}(\text{symmetry_of_plus}, \text{axiom})$

$\forall x, y: (x \leq y \iff (\text{less}(x, y) \text{ or } x = y))$ $\text{fof}(\text{less_or_equal}, \text{axiom})$

$\neg \exists x: \text{less}(x, n_0)$ $\text{fof}(\text{less}_0, \text{axiom})$

$\forall x: (\text{less}(x, n_1) \iff x \leq n_0)$ $\text{fof}(\text{less}_1, \text{axiom})$

$\forall x: (\text{less}(x, n_2) \iff x \leq n_1)$ $\text{fof}(\text{less}_2, \text{axiom})$

$\forall x: (\text{less}(x, n_3) \iff x \leq n_2)$ $\text{fof}(\text{less}_3, \text{axiom})$

$\forall x: (\text{less}(x, n_4) \iff x \leq n_3)$ $\text{fof}(\text{less}_4, \text{axiom})$

$\forall x: (\text{less}(x, n_5) \iff x \leq n_4)$ $\text{fof}(\text{less}_5, \text{axiom})$

$\forall x: (\text{less}(x, n_6) \iff x \leq n_5)$ $\text{fof}(\text{less}_6, \text{axiom})$

$\forall x: (\text{less}(x, n_7) \iff x \leq n_6)$ fof(less7, axiom)
 $\forall x: (\text{less}(x, n_8) \iff x \leq n_7)$ fof(less8, axiom)
 $\forall x: (\text{less}(x, n_9) \iff x \leq n_8)$ fof(less9, axiom)
 $\forall x, y: (\text{less}(x, y) \iff (\neg \text{less}(y, x) \text{ and } y \neq x))$ fof(less_property, axiom)
holdsAt(waterLevel(n_0), n_0) fof(waterLevel₀, hypothesis)
 \neg holdsAt(filling, n_0) fof(not_filling₀, hypothesis)
 \neg holdsAt(spilling, n_0) fof(not_spilling₀, hypothesis)
 \forall height: \neg releasedAt(waterLevel(height), n_0) fof(not_released_waterLevel₀, hypothesis)
 \neg releasedAt(filling, n_0) fof(not_released_filling₀, hypothesis)
 \neg releasedAt(spilling, n_0) fof(not_released_spilling₀, hypothesis)
holdsAt(spilling, n_4) fof(spilling₄, conjecture)

CSR004+1.p Overflow happens at time 3

include('Axioms/CSR001+0.ax')

include('Axioms/CSR001+1.ax')

$n_0 + n_0 = n_0$ fof(plus0₀, axiom)
 $n_0 + n_1 = n_1$ fof(plus0₁, axiom)
 $n_0 + n_2 = n_2$ fof(plus0₂, axiom)
 $n_0 + n_3 = n_3$ fof(plus0₃, axiom)
 $n_1 + n_1 = n_2$ fof(plus1₁, axiom)
 $n_1 + n_2 = n_3$ fof(plus1₂, axiom)
 $n_1 + n_3 = n_4$ fof(plus1₃, axiom)
 $n_2 + n_2 = n_4$ fof(plus2₂, axiom)
 $n_2 + n_3 = n_5$ fof(plus2₃, axiom)
 $n_3 + n_3 = n_6$ fof(plus3₃, axiom)
 $\forall x, y: x + y = y + x$ fof(symmetry_of_plus, axiom)
 $\forall x, y: (x \leq y \iff (\text{less}(x, y) \text{ or } x = y))$ fof(less_or_equal, axiom)
 $\neg \exists x: \text{less}(x, n_0)$ fof(less₀, axiom)
 $\forall x: (\text{less}(x, n_1) \iff x \leq n_0)$ fof(less₁, axiom)
 $\forall x: (\text{less}(x, n_2) \iff x \leq n_1)$ fof(less₂, axiom)
 $\forall x: (\text{less}(x, n_3) \iff x \leq n_2)$ fof(less₃, axiom)
 $\forall x: (\text{less}(x, n_4) \iff x \leq n_3)$ fof(less₄, axiom)
 $\forall x: (\text{less}(x, n_5) \iff x \leq n_4)$ fof(less₅, axiom)
 $\forall x: (\text{less}(x, n_6) \iff x \leq n_5)$ fof(less₆, axiom)
 $\forall x: (\text{less}(x, n_7) \iff x \leq n_6)$ fof(less₇, axiom)
 $\forall x: (\text{less}(x, n_8) \iff x \leq n_7)$ fof(less₈, axiom)
 $\forall x: (\text{less}(x, n_9) \iff x \leq n_8)$ fof(less₉, axiom)
 $\forall x, y: (\text{less}(x, y) \iff (\neg \text{less}(y, x) \text{ and } y \neq x))$ fof(less_property, axiom)
holdsAt(waterLevel(n_0), n_0) fof(waterLevel₀, hypothesis)
 \neg holdsAt(filling, n_0) fof(not_filling₀, hypothesis)
 \neg holdsAt(spilling, n_0) fof(not_spilling₀, hypothesis)
 \forall height: \neg releasedAt(waterLevel(height), n_0) fof(not_released_waterLevel₀, hypothesis)
 \neg releasedAt(filling, n_0) fof(not_released_filling₀, hypothesis)
 \neg releasedAt(spilling, n_0) fof(not_released_spilling₀, hypothesis)
happens(overflow, n_3) fof(overflow₃, conjecture)

CSR004+2.p Overflow happens at time 3

include('Axioms/CSR001+0.ax')

include('Axioms/CSR001+1.ax')

$n_0 + n_0 = n_0$ fof(plus0₀, axiom)
 $n_0 + n_1 = n_1$ fof(plus0₁, axiom)
 $n_0 + n_2 = n_2$ fof(plus0₂, axiom)
 $n_0 + n_3 = n_3$ fof(plus0₃, axiom)
 $n_1 + n_1 = n_2$ fof(plus1₁, axiom)
 $n_1 + n_2 = n_3$ fof(plus1₂, axiom)
 $n_1 + n_3 = n_4$ fof(plus1₃, axiom)
 $n_2 + n_2 = n_4$ fof(plus2₂, axiom)
 $n_2 + n_3 = n_5$ fof(plus2₃, axiom)
 $n_3 + n_3 = n_6$ fof(plus3₃, axiom)
 $\forall x, y: x + y = y + x$ fof(symmetry_of_plus, axiom)

$\forall x, y: (x \leq y \iff (\text{less}(x, y) \text{ or } x = y))$ fof(less_or_equal, axiom)
 $\neg \exists x: \text{less}(x, n_0)$ fof(less₀, axiom)
 $\forall x: (\text{less}(x, n_1) \iff x \leq n_0)$ fof(less₁, axiom)
 $\forall x: (\text{less}(x, n_2) \iff x \leq n_1)$ fof(less₂, axiom)
 $\forall x: (\text{less}(x, n_3) \iff x \leq n_2)$ fof(less₃, axiom)
 $\forall x: (\text{less}(x, n_4) \iff x \leq n_3)$ fof(less₄, axiom)
 $\forall x: (\text{less}(x, n_5) \iff x \leq n_4)$ fof(less₅, axiom)
 $\forall x: (\text{less}(x, n_6) \iff x \leq n_5)$ fof(less₆, axiom)
 $\forall x: (\text{less}(x, n_7) \iff x \leq n_6)$ fof(less₇, axiom)
 $\forall x: (\text{less}(x, n_8) \iff x \leq n_7)$ fof(less₈, axiom)
 $\forall x: (\text{less}(x, n_9) \iff x \leq n_8)$ fof(less₉, axiom)
 $\forall x, y: (\text{less}(x, y) \iff (\neg \text{less}(y, x) \text{ and } y \neq x))$ fof(less_property, axiom)
holdsAt(waterLevel(n_0), n_0) fof(waterLevel₀, hypothesis)
 \neg holdsAt(filling, n_0) fof(not_filling₀, hypothesis)
 \neg holdsAt(spilling, n_0) fof(not_spilling₀, hypothesis)
 \forall height: \neg releasedAt(waterLevel(height), n_0) fof(not_released_waterLevel₀, hypothesis)
 \neg releasedAt(filling, n_0) fof(not_released_filling₀, hypothesis)
 \neg releasedAt(spilling, n_0) fof(not_released_spilling₀, hypothesis)
holdsAt(waterLevel(n_3), n_3) fof(waterLevel₃, lemma)
holdsAt(filling, n_3) fof(filling₃, lemma)
happens(overflow, n_3) fof(overflow₃, conjecture)

CSR005+1.p Filling at time 3

include('Axioms/CSR001+0.ax')
include('Axioms/CSR001+1.ax')
 $n_0 + n_0 = n_0$ fof(plus₀, axiom)
 $n_0 + n_1 = n_1$ fof(plus₀₁, axiom)
 $n_0 + n_2 = n_2$ fof(plus₀₂, axiom)
 $n_0 + n_3 = n_3$ fof(plus₀₃, axiom)
 $n_1 + n_1 = n_2$ fof(plus₁₁, axiom)
 $n_1 + n_2 = n_3$ fof(plus₁₂, axiom)
 $n_1 + n_3 = n_4$ fof(plus₁₃, axiom)
 $n_2 + n_2 = n_4$ fof(plus₂₂, axiom)
 $n_2 + n_3 = n_5$ fof(plus₂₃, axiom)
 $n_3 + n_3 = n_6$ fof(plus₃₃, axiom)
 $\forall x, y: x + y = y + x$ fof(symmetry_of_plus, axiom)
 $\forall x, y: (x \leq y \iff (\text{less}(x, y) \text{ or } x = y))$ fof(less_or_equal, axiom)
 $\neg \exists x: \text{less}(x, n_0)$ fof(less₀, axiom)
 $\forall x: (\text{less}(x, n_1) \iff x \leq n_0)$ fof(less₁, axiom)
 $\forall x: (\text{less}(x, n_2) \iff x \leq n_1)$ fof(less₂, axiom)
 $\forall x: (\text{less}(x, n_3) \iff x \leq n_2)$ fof(less₃, axiom)
 $\forall x: (\text{less}(x, n_4) \iff x \leq n_3)$ fof(less₄, axiom)
 $\forall x: (\text{less}(x, n_5) \iff x \leq n_4)$ fof(less₅, axiom)
 $\forall x: (\text{less}(x, n_6) \iff x \leq n_5)$ fof(less₆, axiom)
 $\forall x: (\text{less}(x, n_7) \iff x \leq n_6)$ fof(less₇, axiom)
 $\forall x: (\text{less}(x, n_8) \iff x \leq n_7)$ fof(less₈, axiom)
 $\forall x: (\text{less}(x, n_9) \iff x \leq n_8)$ fof(less₉, axiom)
 $\forall x, y: (\text{less}(x, y) \iff (\neg \text{less}(y, x) \text{ and } y \neq x))$ fof(less_property, axiom)
holdsAt(waterLevel(n_0), n_0) fof(waterLevel₀, hypothesis)
 \neg holdsAt(filling, n_0) fof(not_filling₀, hypothesis)
 \neg holdsAt(spilling, n_0) fof(not_spilling₀, hypothesis)
 \forall height: \neg releasedAt(waterLevel(height), n_0) fof(not_released_waterLevel₀, hypothesis)
 \neg releasedAt(filling, n_0) fof(not_released_filling₀, hypothesis)
 \neg releasedAt(spilling, n_0) fof(not_released_spilling₀, hypothesis)
holdsAt(filling, n_3) fof(filling₃, conjecture)

CSR005+2.p Filling at time 3

include('Axioms/CSR001+0.ax')
include('Axioms/CSR001+1.ax')
 $n_0 + n_0 = n_0$ fof(plus₀, axiom)

$n_0 + n_1 = n_1$ fof(plus0₁, axiom)
 $n_0 + n_2 = n_2$ fof(plus0₂, axiom)
 $n_0 + n_3 = n_3$ fof(plus0₃, axiom)
 $n_1 + n_1 = n_2$ fof(plus1₁, axiom)
 $n_1 + n_2 = n_3$ fof(plus1₂, axiom)
 $n_1 + n_3 = n_4$ fof(plus1₃, axiom)
 $n_2 + n_2 = n_4$ fof(plus2₂, axiom)
 $n_2 + n_3 = n_5$ fof(plus2₃, axiom)
 $n_3 + n_3 = n_6$ fof(plus3₃, axiom)
 $\forall x, y: x + y = y + x$ fof(symmetry_of_plus, axiom)
 $\forall x, y: (x \leq y \iff (\text{less}(x, y) \text{ or } x = y))$ fof(less_or_equal, axiom)
 $\neg \exists x: \text{less}(x, n_0)$ fof(less₀, axiom)
 $\forall x: (\text{less}(x, n_1) \iff x \leq n_0)$ fof(less₁, axiom)
 $\forall x: (\text{less}(x, n_2) \iff x \leq n_1)$ fof(less₂, axiom)
 $\forall x: (\text{less}(x, n_3) \iff x \leq n_2)$ fof(less₃, axiom)
 $\forall x: (\text{less}(x, n_4) \iff x \leq n_3)$ fof(less₄, axiom)
 $\forall x: (\text{less}(x, n_5) \iff x \leq n_4)$ fof(less₅, axiom)
 $\forall x: (\text{less}(x, n_6) \iff x \leq n_5)$ fof(less₆, axiom)
 $\forall x: (\text{less}(x, n_7) \iff x \leq n_6)$ fof(less₇, axiom)
 $\forall x: (\text{less}(x, n_8) \iff x \leq n_7)$ fof(less₈, axiom)
 $\forall x: (\text{less}(x, n_9) \iff x \leq n_8)$ fof(less₉, axiom)
 $\forall x, y: (\text{less}(x, y) \iff (\neg \text{less}(y, x) \text{ and } y \neq x))$ fof(less_property, axiom)
holdsAt(waterLevel(n_0), n_0) fof(waterLevel₀, hypothesis)
 \neg holdsAt(filling, n_0) fof(not_filling₀, hypothesis)
 \neg holdsAt(spilling, n_0) fof(not_spilling₀, hypothesis)
 \forall height: \neg releasedAt(waterLevel(height), n_0) fof(not_released_waterLevel₀, hypothesis)
 \neg releasedAt(filling, n_0) fof(not_released_filling₀, hypothesis)
 \neg releasedAt(spilling, n_0) fof(not_released_spilling₀, hypothesis)
 \neg releasedAt(filling, n_3) fof(filling_3_1₁, lemma)
holdsAt(filling, n_3) fof(filling₃, conjecture)

CSR006+1.p Waterlevel is 3 at time 3

include('Axioms/CSR001+0.ax')
include('Axioms/CSR001+1.ax')
 $n_0 + n_0 = n_0$ fof(plus0₀, axiom)
 $n_0 + n_1 = n_1$ fof(plus0₁, axiom)
 $n_0 + n_2 = n_2$ fof(plus0₂, axiom)
 $n_0 + n_3 = n_3$ fof(plus0₃, axiom)
 $n_1 + n_1 = n_2$ fof(plus1₁, axiom)
 $n_1 + n_2 = n_3$ fof(plus1₂, axiom)
 $n_1 + n_3 = n_4$ fof(plus1₃, axiom)
 $n_2 + n_2 = n_4$ fof(plus2₂, axiom)
 $n_2 + n_3 = n_5$ fof(plus2₃, axiom)
 $n_3 + n_3 = n_6$ fof(plus3₃, axiom)
 $\forall x, y: x + y = y + x$ fof(symmetry_of_plus, axiom)
 $\forall x, y: (x \leq y \iff (\text{less}(x, y) \text{ or } x = y))$ fof(less_or_equal, axiom)
 $\neg \exists x: \text{less}(x, n_0)$ fof(less₀, axiom)
 $\forall x: (\text{less}(x, n_1) \iff x \leq n_0)$ fof(less₁, axiom)
 $\forall x: (\text{less}(x, n_2) \iff x \leq n_1)$ fof(less₂, axiom)
 $\forall x: (\text{less}(x, n_3) \iff x \leq n_2)$ fof(less₃, axiom)
 $\forall x: (\text{less}(x, n_4) \iff x \leq n_3)$ fof(less₄, axiom)
 $\forall x: (\text{less}(x, n_5) \iff x \leq n_4)$ fof(less₅, axiom)
 $\forall x: (\text{less}(x, n_6) \iff x \leq n_5)$ fof(less₆, axiom)
 $\forall x: (\text{less}(x, n_7) \iff x \leq n_6)$ fof(less₇, axiom)
 $\forall x: (\text{less}(x, n_8) \iff x \leq n_7)$ fof(less₈, axiom)
 $\forall x: (\text{less}(x, n_9) \iff x \leq n_8)$ fof(less₉, axiom)
 $\forall x, y: (\text{less}(x, y) \iff (\neg \text{less}(y, x) \text{ and } y \neq x))$ fof(less_property, axiom)
holdsAt(waterLevel(n_0), n_0) fof(waterLevel₀, hypothesis)
 \neg holdsAt(filling, n_0) fof(not_filling₀, hypothesis)
 \neg holdsAt(spilling, n_0) fof(not_spilling₀, hypothesis)

$\forall \text{height: } \neg \text{releasedAt}(\text{waterLevel}(\text{height}), n_0) \quad \text{fof}(\text{not_released_waterLevel}_0, \text{hypothesis})$
 $\neg \text{releasedAt}(\text{filling}, n_0) \quad \text{fof}(\text{not_released_filling}_0, \text{hypothesis})$
 $\neg \text{releasedAt}(\text{spilling}, n_0) \quad \text{fof}(\text{not_released_spilling}_0, \text{hypothesis})$
 $\text{holdsAt}(\text{waterLevel}(n_3), n_3) \quad \text{fof}(\text{waterLevel}_3, \text{conjecture})$

CSR007+1.p Waterlevel is not 3 at time 2

include('Axioms/CSR001+0.ax')

include('Axioms/CSR001+1.ax')

$n_0 + n_0 = n_0 \quad \text{fof}(\text{plus0}_0, \text{axiom})$

$n_0 + n_1 = n_1 \quad \text{fof}(\text{plus0}_1, \text{axiom})$

$n_0 + n_2 = n_2 \quad \text{fof}(\text{plus0}_2, \text{axiom})$

$n_0 + n_3 = n_3 \quad \text{fof}(\text{plus0}_3, \text{axiom})$

$n_1 + n_1 = n_2 \quad \text{fof}(\text{plus1}_1, \text{axiom})$

$n_1 + n_2 = n_3 \quad \text{fof}(\text{plus1}_2, \text{axiom})$

$n_1 + n_3 = n_4 \quad \text{fof}(\text{plus1}_3, \text{axiom})$

$n_2 + n_2 = n_4 \quad \text{fof}(\text{plus2}_2, \text{axiom})$

$n_2 + n_3 = n_5 \quad \text{fof}(\text{plus2}_3, \text{axiom})$

$n_3 + n_3 = n_6 \quad \text{fof}(\text{plus3}_3, \text{axiom})$

$\forall x, y: x + y = y + x \quad \text{fof}(\text{symmetry_of_plus}, \text{axiom})$

$\forall x, y: (x \leq y \iff (\text{less}(x, y) \text{ or } x = y)) \quad \text{fof}(\text{less_or_equal}, \text{axiom})$

$\neg \exists x: \text{less}(x, n_0) \quad \text{fof}(\text{less}_0, \text{axiom})$

$\forall x: (\text{less}(x, n_1) \iff x \leq n_0) \quad \text{fof}(\text{less}_1, \text{axiom})$

$\forall x: (\text{less}(x, n_2) \iff x \leq n_1) \quad \text{fof}(\text{less}_2, \text{axiom})$

$\forall x: (\text{less}(x, n_3) \iff x \leq n_2) \quad \text{fof}(\text{less}_3, \text{axiom})$

$\forall x: (\text{less}(x, n_4) \iff x \leq n_3) \quad \text{fof}(\text{less}_4, \text{axiom})$

$\forall x: (\text{less}(x, n_5) \iff x \leq n_4) \quad \text{fof}(\text{less}_5, \text{axiom})$

$\forall x: (\text{less}(x, n_6) \iff x \leq n_5) \quad \text{fof}(\text{less}_6, \text{axiom})$

$\forall x: (\text{less}(x, n_7) \iff x \leq n_6) \quad \text{fof}(\text{less}_7, \text{axiom})$

$\forall x: (\text{less}(x, n_8) \iff x \leq n_7) \quad \text{fof}(\text{less}_8, \text{axiom})$

$\forall x: (\text{less}(x, n_9) \iff x \leq n_8) \quad \text{fof}(\text{less}_9, \text{axiom})$

$\forall x, y: (\text{less}(x, y) \iff (\neg \text{less}(y, x) \text{ and } y \neq x)) \quad \text{fof}(\text{less_property}, \text{axiom})$

$\text{holdsAt}(\text{waterLevel}(n_0), n_0) \quad \text{fof}(\text{waterLevel}_0, \text{hypothesis})$

$\neg \text{holdsAt}(\text{filling}, n_0) \quad \text{fof}(\text{not_filling}_0, \text{hypothesis})$

$\neg \text{holdsAt}(\text{spilling}, n_0) \quad \text{fof}(\text{not_spilling}_0, \text{hypothesis})$

$\forall \text{height: } \neg \text{releasedAt}(\text{waterLevel}(\text{height}), n_0) \quad \text{fof}(\text{not_released_waterLevel}_0, \text{hypothesis})$

$\neg \text{releasedAt}(\text{filling}, n_0) \quad \text{fof}(\text{not_released_filling}_0, \text{hypothesis})$

$\neg \text{releasedAt}(\text{spilling}, n_0) \quad \text{fof}(\text{not_released_spilling}_0, \text{hypothesis})$

$\neg \text{holdsAt}(\text{waterLevel}(n_3), n_2) \quad \text{fof}(\text{waterlevel_not}_3, \text{conjecture})$

CSR008+1.p Waterlevel is 2 at time 2

include('Axioms/CSR001+0.ax')

include('Axioms/CSR001+1.ax')

$n_0 + n_0 = n_0 \quad \text{fof}(\text{plus0}_0, \text{axiom})$

$n_0 + n_1 = n_1 \quad \text{fof}(\text{plus0}_1, \text{axiom})$

$n_0 + n_2 = n_2 \quad \text{fof}(\text{plus0}_2, \text{axiom})$

$n_0 + n_3 = n_3 \quad \text{fof}(\text{plus0}_3, \text{axiom})$

$n_1 + n_1 = n_2 \quad \text{fof}(\text{plus1}_1, \text{axiom})$

$n_1 + n_2 = n_3 \quad \text{fof}(\text{plus1}_2, \text{axiom})$

$n_1 + n_3 = n_4 \quad \text{fof}(\text{plus1}_3, \text{axiom})$

$n_2 + n_2 = n_4 \quad \text{fof}(\text{plus2}_2, \text{axiom})$

$n_2 + n_3 = n_5 \quad \text{fof}(\text{plus2}_3, \text{axiom})$

$n_3 + n_3 = n_6 \quad \text{fof}(\text{plus3}_3, \text{axiom})$

$\forall x, y: x + y = y + x \quad \text{fof}(\text{symmetry_of_plus}, \text{axiom})$

$\forall x, y: (x \leq y \iff (\text{less}(x, y) \text{ or } x = y)) \quad \text{fof}(\text{less_or_equal}, \text{axiom})$

$\neg \exists x: \text{less}(x, n_0) \quad \text{fof}(\text{less}_0, \text{axiom})$

$\forall x: (\text{less}(x, n_1) \iff x \leq n_0) \quad \text{fof}(\text{less}_1, \text{axiom})$

$\forall x: (\text{less}(x, n_2) \iff x \leq n_1) \quad \text{fof}(\text{less}_2, \text{axiom})$

$\forall x: (\text{less}(x, n_3) \iff x \leq n_2) \quad \text{fof}(\text{less}_3, \text{axiom})$

$\forall x: (\text{less}(x, n_4) \iff x \leq n_3) \quad \text{fof}(\text{less}_4, \text{axiom})$

$\forall x: (\text{less}(x, n_5) \iff x \leq n_4) \quad \text{fof}(\text{less}_5, \text{axiom})$

$\forall x: (\text{less}(x, n_6) \iff x \leq n_5)$ fof(less₆, axiom)
 $\forall x: (\text{less}(x, n_7) \iff x \leq n_6)$ fof(less₇, axiom)
 $\forall x: (\text{less}(x, n_8) \iff x \leq n_7)$ fof(less₈, axiom)
 $\forall x: (\text{less}(x, n_9) \iff x \leq n_8)$ fof(less₉, axiom)
 $\forall x, y: (\text{less}(x, y) \iff (\neg \text{less}(y, x) \text{ and } y \neq x))$ fof(less_property, axiom)
holdsAt(waterLevel(n_0), n_0) fof(waterLevel₀, hypothesis)
 \neg holdsAt(filling, n_0) fof(not_filling₀, hypothesis)
 \neg holdsAt(spilling, n_0) fof(not_spilling₀, hypothesis)
 \forall height: \neg releasedAt(waterLevel(height), n_0) fof(not_released_waterLevel₀, hypothesis)
 \neg releasedAt(filling, n_0) fof(not_released_filling₀, hypothesis)
 \neg releasedAt(spilling, n_0) fof(not_released_spilling₀, hypothesis)
holdsAt(waterLevel(n_2), n_2) fof(waterLevel₂, conjecture)

CSR009+1.p Filling at time 2

include('Axioms/CSR001+0.ax')
include('Axioms/CSR001+1.ax')
 $n_0 + n_0 = n_0$ fof(plus0₀, axiom)
 $n_0 + n_1 = n_1$ fof(plus0₁, axiom)
 $n_0 + n_2 = n_2$ fof(plus0₂, axiom)
 $n_0 + n_3 = n_3$ fof(plus0₃, axiom)
 $n_1 + n_1 = n_2$ fof(plus1₁, axiom)
 $n_1 + n_2 = n_3$ fof(plus1₂, axiom)
 $n_1 + n_3 = n_4$ fof(plus1₃, axiom)
 $n_2 + n_2 = n_4$ fof(plus2₂, axiom)
 $n_2 + n_3 = n_5$ fof(plus2₃, axiom)
 $n_3 + n_3 = n_6$ fof(plus3₃, axiom)
 $\forall x, y: x + y = y + x$ fof(symmetry_of_plus, axiom)
 $\forall x, y: (x \leq y \iff (\text{less}(x, y) \text{ or } x = y))$ fof(less_or_equal, axiom)
 $\neg \exists x: \text{less}(x, n_0)$ fof(less₀, axiom)
 $\forall x: (\text{less}(x, n_1) \iff x \leq n_0)$ fof(less₁, axiom)
 $\forall x: (\text{less}(x, n_2) \iff x \leq n_1)$ fof(less₂, axiom)
 $\forall x: (\text{less}(x, n_3) \iff x \leq n_2)$ fof(less₃, axiom)
 $\forall x: (\text{less}(x, n_4) \iff x \leq n_3)$ fof(less₄, axiom)
 $\forall x: (\text{less}(x, n_5) \iff x \leq n_4)$ fof(less₅, axiom)
 $\forall x: (\text{less}(x, n_6) \iff x \leq n_5)$ fof(less₆, axiom)
 $\forall x: (\text{less}(x, n_7) \iff x \leq n_6)$ fof(less₇, axiom)
 $\forall x: (\text{less}(x, n_8) \iff x \leq n_7)$ fof(less₈, axiom)
 $\forall x: (\text{less}(x, n_9) \iff x \leq n_8)$ fof(less₉, axiom)
 $\forall x, y: (\text{less}(x, y) \iff (\neg \text{less}(y, x) \text{ and } y \neq x))$ fof(less_property, axiom)
holdsAt(waterLevel(n_0), n_0) fof(waterLevel₀, hypothesis)
 \neg holdsAt(filling, n_0) fof(not_filling₀, hypothesis)
 \neg holdsAt(spilling, n_0) fof(not_spilling₀, hypothesis)
 \forall height: \neg releasedAt(waterLevel(height), n_0) fof(not_released_waterLevel₀, hypothesis)
 \neg releasedAt(filling, n_0) fof(not_released_filling₀, hypothesis)
 \neg releasedAt(spilling, n_0) fof(not_released_spilling₀, hypothesis)
holdsAt(filling, n_2) fof(filling₂, conjecture)

CSR010+1.p Filling at time 1

include('Axioms/CSR001+0.ax')
include('Axioms/CSR001+1.ax')
 $n_0 + n_0 = n_0$ fof(plus0₀, axiom)
 $n_0 + n_1 = n_1$ fof(plus0₁, axiom)
 $n_0 + n_2 = n_2$ fof(plus0₂, axiom)
 $n_0 + n_3 = n_3$ fof(plus0₃, axiom)
 $n_1 + n_1 = n_2$ fof(plus1₁, axiom)
 $n_1 + n_2 = n_3$ fof(plus1₂, axiom)
 $n_1 + n_3 = n_4$ fof(plus1₃, axiom)
 $n_2 + n_2 = n_4$ fof(plus2₂, axiom)
 $n_2 + n_3 = n_5$ fof(plus2₃, axiom)
 $n_3 + n_3 = n_6$ fof(plus3₃, axiom)

$\forall x, y: x + y = y + x$ fof(symmetry_of_plus, axiom)
 $\forall x, y: (x \leq y \iff (\text{less}(x, y) \text{ or } x = y))$ fof(less_or_equal, axiom)
 $\neg \exists x: \text{less}(x, n_0)$ fof(less0, axiom)
 $\forall x: (\text{less}(x, n_1) \iff x \leq n_0)$ fof(less1, axiom)
 $\forall x: (\text{less}(x, n_2) \iff x \leq n_1)$ fof(less2, axiom)
 $\forall x: (\text{less}(x, n_3) \iff x \leq n_2)$ fof(less3, axiom)
 $\forall x: (\text{less}(x, n_4) \iff x \leq n_3)$ fof(less4, axiom)
 $\forall x: (\text{less}(x, n_5) \iff x \leq n_4)$ fof(less5, axiom)
 $\forall x: (\text{less}(x, n_6) \iff x \leq n_5)$ fof(less6, axiom)
 $\forall x: (\text{less}(x, n_7) \iff x \leq n_6)$ fof(less7, axiom)
 $\forall x: (\text{less}(x, n_8) \iff x \leq n_7)$ fof(less8, axiom)
 $\forall x: (\text{less}(x, n_9) \iff x \leq n_8)$ fof(less9, axiom)
 $\forall x, y: (\text{less}(x, y) \iff (\neg \text{less}(y, x) \text{ and } y \neq x))$ fof(less_property, axiom)
holdsAt(waterLevel(n_0), n_0) fof(waterLevel0, hypothesis)
 \neg holdsAt(filling, n_0) fof(not_filling0, hypothesis)
 \neg holdsAt(spilling, n_0) fof(not_spilling0, hypothesis)
 $\forall \text{height}: \neg$ releasedAt(waterLevel(height), n_0) fof(not_released_waterLevel0, hypothesis)
 \neg releasedAt(filling, n_0) fof(not_released_filling0, hypothesis)
 \neg releasedAt(spilling, n_0) fof(not_released_spilling0, hypothesis)
holdsAt(filling, n_1) fof(filling1, lemma)

CSR011+1.p Not stopped filling between times 0 and 3

include('Axioms/CSR001+0.ax')
include('Axioms/CSR001+1.ax')
 $n_0 + n_0 = n_0$ fof(plus00, axiom)
 $n_0 + n_1 = n_1$ fof(plus01, axiom)
 $n_0 + n_2 = n_2$ fof(plus02, axiom)
 $n_0 + n_3 = n_3$ fof(plus03, axiom)
 $n_1 + n_1 = n_2$ fof(plus11, axiom)
 $n_1 + n_2 = n_3$ fof(plus12, axiom)
 $n_1 + n_3 = n_4$ fof(plus13, axiom)
 $n_2 + n_2 = n_4$ fof(plus22, axiom)
 $n_2 + n_3 = n_5$ fof(plus23, axiom)
 $n_3 + n_3 = n_6$ fof(plus33, axiom)
 $\forall x, y: x + y = y + x$ fof(symmetry_of_plus, axiom)
 $\forall x, y: (x \leq y \iff (\text{less}(x, y) \text{ or } x = y))$ fof(less_or_equal, axiom)
 $\neg \exists x: \text{less}(x, n_0)$ fof(less0, axiom)
 $\forall x: (\text{less}(x, n_1) \iff x \leq n_0)$ fof(less1, axiom)
 $\forall x: (\text{less}(x, n_2) \iff x \leq n_1)$ fof(less2, axiom)
 $\forall x: (\text{less}(x, n_3) \iff x \leq n_2)$ fof(less3, axiom)
 $\forall x: (\text{less}(x, n_4) \iff x \leq n_3)$ fof(less4, axiom)
 $\forall x: (\text{less}(x, n_5) \iff x \leq n_4)$ fof(less5, axiom)
 $\forall x: (\text{less}(x, n_6) \iff x \leq n_5)$ fof(less6, axiom)
 $\forall x: (\text{less}(x, n_7) \iff x \leq n_6)$ fof(less7, axiom)
 $\forall x: (\text{less}(x, n_8) \iff x \leq n_7)$ fof(less8, axiom)
 $\forall x: (\text{less}(x, n_9) \iff x \leq n_8)$ fof(less9, axiom)
 $\forall x, y: (\text{less}(x, y) \iff (\neg \text{less}(y, x) \text{ and } y \neq x))$ fof(less_property, axiom)
holdsAt(waterLevel(n_0), n_0) fof(waterLevel0, hypothesis)
 \neg holdsAt(filling, n_0) fof(not_filling0, hypothesis)
 \neg holdsAt(spilling, n_0) fof(not_spilling0, hypothesis)
 $\forall \text{height}: \neg$ releasedAt(waterLevel(height), n_0) fof(not_released_waterLevel0, hypothesis)
 \neg releasedAt(filling, n_0) fof(not_released_filling0, hypothesis)
 \neg releasedAt(spilling, n_0) fof(not_released_spilling0, hypothesis)
 \neg stoppedIn(n_0 , filling, n_3) fof(not_stopped_filling_03, conjecture)

CSR012+1.p Waterlevel is 1 at time 1

include('Axioms/CSR001+0.ax')
include('Axioms/CSR001+1.ax')
 $n_0 + n_0 = n_0$ fof(plus00, axiom)
 $n_0 + n_1 = n_1$ fof(plus01, axiom)

$n_0 + n_2 = n_2$ fof(plus0₂, axiom)
 $n_0 + n_3 = n_3$ fof(plus0₃, axiom)
 $n_1 + n_1 = n_2$ fof(plus1₁, axiom)
 $n_1 + n_2 = n_3$ fof(plus1₂, axiom)
 $n_1 + n_3 = n_4$ fof(plus1₃, axiom)
 $n_2 + n_2 = n_4$ fof(plus2₂, axiom)
 $n_2 + n_3 = n_5$ fof(plus2₃, axiom)
 $n_3 + n_3 = n_6$ fof(plus3₃, axiom)
 $\forall x, y: x + y = y + x$ fof(symmetry_of_plus, axiom)
 $\forall x, y: (x \leq y \iff (\text{less}(x, y) \text{ or } x = y))$ fof(less_or_equal, axiom)
 $\neg \exists x: \text{less}(x, n_0)$ fof(less₀, axiom)
 $\forall x: (\text{less}(x, n_1) \iff x \leq n_0)$ fof(less₁, axiom)
 $\forall x: (\text{less}(x, n_2) \iff x \leq n_1)$ fof(less₂, axiom)
 $\forall x: (\text{less}(x, n_3) \iff x \leq n_2)$ fof(less₃, axiom)
 $\forall x: (\text{less}(x, n_4) \iff x \leq n_3)$ fof(less₄, axiom)
 $\forall x: (\text{less}(x, n_5) \iff x \leq n_4)$ fof(less₅, axiom)
 $\forall x: (\text{less}(x, n_6) \iff x \leq n_5)$ fof(less₆, axiom)
 $\forall x: (\text{less}(x, n_7) \iff x \leq n_6)$ fof(less₇, axiom)
 $\forall x: (\text{less}(x, n_8) \iff x \leq n_7)$ fof(less₈, axiom)
 $\forall x: (\text{less}(x, n_9) \iff x \leq n_8)$ fof(less₉, axiom)
 $\forall x, y: (\text{less}(x, y) \iff (\neg \text{less}(y, x) \text{ and } y \neq x))$ fof(less_property, axiom)
holdsAt(waterLevel(n_0), n_0) fof(waterLevel₀, hypothesis)
 \neg holdsAt(filling, n_0) fof(not_filling₀, hypothesis)
 \neg holdsAt(spilling, n_0) fof(not_spilling₀, hypothesis)
 \forall height: \neg releasedAt(waterLevel(height), n_0) fof(not_released_waterLevel₀, hypothesis)
 \neg releasedAt(filling, n_0) fof(not_released_filling₀, hypothesis)
 \neg releasedAt(spilling, n_0) fof(not_released_spilling₀, hypothesis)
holdsAt(waterLevel(n_1), n_1) fof(waterLevel₁, conjecture)

CSR013+1.p Nothing happens to stop filling at time 2

include('Axioms/CSR001+0.ax')

include('Axioms/CSR001+1.ax')

$n_0 + n_0 = n_0$ fof(plus0₀, axiom)
 $n_0 + n_1 = n_1$ fof(plus0₁, axiom)
 $n_0 + n_2 = n_2$ fof(plus0₂, axiom)
 $n_0 + n_3 = n_3$ fof(plus0₃, axiom)
 $n_1 + n_1 = n_2$ fof(plus1₁, axiom)
 $n_1 + n_2 = n_3$ fof(plus1₂, axiom)
 $n_1 + n_3 = n_4$ fof(plus1₃, axiom)
 $n_2 + n_2 = n_4$ fof(plus2₂, axiom)
 $n_2 + n_3 = n_5$ fof(plus2₃, axiom)
 $n_3 + n_3 = n_6$ fof(plus3₃, axiom)
 $\forall x, y: x + y = y + x$ fof(symmetry_of_plus, axiom)
 $\forall x, y: (x \leq y \iff (\text{less}(x, y) \text{ or } x = y))$ fof(less_or_equal, axiom)
 $\neg \exists x: \text{less}(x, n_0)$ fof(less₀, axiom)
 $\forall x: (\text{less}(x, n_1) \iff x \leq n_0)$ fof(less₁, axiom)
 $\forall x: (\text{less}(x, n_2) \iff x \leq n_1)$ fof(less₂, axiom)
 $\forall x: (\text{less}(x, n_3) \iff x \leq n_2)$ fof(less₃, axiom)
 $\forall x: (\text{less}(x, n_4) \iff x \leq n_3)$ fof(less₄, axiom)
 $\forall x: (\text{less}(x, n_5) \iff x \leq n_4)$ fof(less₅, axiom)
 $\forall x: (\text{less}(x, n_6) \iff x \leq n_5)$ fof(less₆, axiom)
 $\forall x: (\text{less}(x, n_7) \iff x \leq n_6)$ fof(less₇, axiom)
 $\forall x: (\text{less}(x, n_8) \iff x \leq n_7)$ fof(less₈, axiom)
 $\forall x: (\text{less}(x, n_9) \iff x \leq n_8)$ fof(less₉, axiom)
 $\forall x, y: (\text{less}(x, y) \iff (\neg \text{less}(y, x) \text{ and } y \neq x))$ fof(less_property, axiom)
holdsAt(waterLevel(n_0), n_0) fof(waterLevel₀, hypothesis)
 \neg holdsAt(filling, n_0) fof(not_filling₀, hypothesis)
 \neg holdsAt(spilling, n_0) fof(not_spilling₀, hypothesis)
 \forall height: \neg releasedAt(waterLevel(height), n_0) fof(not_released_waterLevel₀, hypothesis)
 \neg releasedAt(filling, n_0) fof(not_released_filling₀, hypothesis)

$\neg \text{releasedAt}(\text{spilling}, n_0) \quad \text{fof}(\text{not_released_spilling}_0, \text{hypothesis})$
 $\neg \exists \text{event}: (\text{happens}(\text{event}, n_2) \text{ and } \text{terminates}(\text{event}, \text{filling}, n_2)) \quad \text{fof}(\text{nothing_terminates_filling}_2, \text{conjecture})$

CSR014+1.p Filling is not released at time 3

include('Axioms/CSR001+0.ax')

include('Axioms/CSR001+1.ax')

$n_0 + n_0 = n_0 \quad \text{fof}(\text{plus0}_0, \text{axiom})$

$n_0 + n_1 = n_1 \quad \text{fof}(\text{plus0}_1, \text{axiom})$

$n_0 + n_2 = n_2 \quad \text{fof}(\text{plus0}_2, \text{axiom})$

$n_0 + n_3 = n_3 \quad \text{fof}(\text{plus0}_3, \text{axiom})$

$n_1 + n_1 = n_2 \quad \text{fof}(\text{plus1}_1, \text{axiom})$

$n_1 + n_2 = n_3 \quad \text{fof}(\text{plus1}_2, \text{axiom})$

$n_1 + n_3 = n_4 \quad \text{fof}(\text{plus1}_3, \text{axiom})$

$n_2 + n_2 = n_4 \quad \text{fof}(\text{plus2}_2, \text{axiom})$

$n_2 + n_3 = n_5 \quad \text{fof}(\text{plus2}_3, \text{axiom})$

$n_3 + n_3 = n_6 \quad \text{fof}(\text{plus3}_3, \text{axiom})$

$\forall x, y: x + y = y + x \quad \text{fof}(\text{symmetry_of_plus}, \text{axiom})$

$\forall x, y: (x \leq y \iff (\text{less}(x, y) \text{ or } x = y)) \quad \text{fof}(\text{less_or_equal}, \text{axiom})$

$\neg \exists x: \text{less}(x, n_0) \quad \text{fof}(\text{less}_0, \text{axiom})$

$\forall x: (\text{less}(x, n_1) \iff x \leq n_0) \quad \text{fof}(\text{less}_1, \text{axiom})$

$\forall x: (\text{less}(x, n_2) \iff x \leq n_1) \quad \text{fof}(\text{less}_2, \text{axiom})$

$\forall x: (\text{less}(x, n_3) \iff x \leq n_2) \quad \text{fof}(\text{less}_3, \text{axiom})$

$\forall x: (\text{less}(x, n_4) \iff x \leq n_3) \quad \text{fof}(\text{less}_4, \text{axiom})$

$\forall x: (\text{less}(x, n_5) \iff x \leq n_4) \quad \text{fof}(\text{less}_5, \text{axiom})$

$\forall x: (\text{less}(x, n_6) \iff x \leq n_5) \quad \text{fof}(\text{less}_6, \text{axiom})$

$\forall x: (\text{less}(x, n_7) \iff x \leq n_6) \quad \text{fof}(\text{less}_7, \text{axiom})$

$\forall x: (\text{less}(x, n_8) \iff x \leq n_7) \quad \text{fof}(\text{less}_8, \text{axiom})$

$\forall x: (\text{less}(x, n_9) \iff x \leq n_8) \quad \text{fof}(\text{less}_9, \text{axiom})$

$\forall x, y: (\text{less}(x, y) \iff (\neg \text{less}(y, x) \text{ and } y \neq x)) \quad \text{fof}(\text{less_property}, \text{axiom})$

holdsAt(waterLevel(n_0), n_0) $\text{fof}(\text{waterLevel}_0, \text{hypothesis})$

$\neg \text{holdsAt}(\text{filling}, n_0) \quad \text{fof}(\text{not_filling}_0, \text{hypothesis})$

$\neg \text{holdsAt}(\text{spilling}, n_0) \quad \text{fof}(\text{not_spilling}_0, \text{hypothesis})$

$\forall \text{height}: \neg \text{releasedAt}(\text{waterLevel}(\text{height}), n_0) \quad \text{fof}(\text{not_released_waterLevel}_0, \text{hypothesis})$

$\neg \text{releasedAt}(\text{filling}, n_0) \quad \text{fof}(\text{not_released_filling}_0, \text{hypothesis})$

$\neg \text{releasedAt}(\text{spilling}, n_0) \quad \text{fof}(\text{not_released_spilling}_0, \text{hypothesis})$

$\neg \text{releasedAt}(\text{filling}, n_3) \quad \text{fof}(\text{filling_3_l}_1, \text{conjecture})$

CSR015+1.p Not backwards at time 1

include('Axioms/CSR001+0.ax')

include('Axioms/CSR001+2.ax')

$n_0 + n_0 = n_0 \quad \text{fof}(\text{plus0}_0, \text{axiom})$

$n_0 + n_1 = n_1 \quad \text{fof}(\text{plus0}_1, \text{axiom})$

$n_0 + n_2 = n_2 \quad \text{fof}(\text{plus0}_2, \text{axiom})$

$n_0 + n_3 = n_3 \quad \text{fof}(\text{plus0}_3, \text{axiom})$

$n_1 + n_1 = n_2 \quad \text{fof}(\text{plus1}_1, \text{axiom})$

$n_1 + n_2 = n_3 \quad \text{fof}(\text{plus1}_2, \text{axiom})$

$n_1 + n_3 = n_4 \quad \text{fof}(\text{plus1}_3, \text{axiom})$

$n_2 + n_2 = n_4 \quad \text{fof}(\text{plus2}_2, \text{axiom})$

$n_2 + n_3 = n_5 \quad \text{fof}(\text{plus2}_3, \text{axiom})$

$n_3 + n_3 = n_6 \quad \text{fof}(\text{plus3}_3, \text{axiom})$

$\forall x, y: x + y = y + x \quad \text{fof}(\text{symmetry_of_plus}, \text{axiom})$

$\forall x, y: (x \leq y \iff (\text{less}(x, y) \text{ or } x = y)) \quad \text{fof}(\text{less_or_equal}, \text{axiom})$

$\neg \exists x: \text{less}(x, n_0) \quad \text{fof}(\text{less}_0, \text{axiom})$

$\forall x: (\text{less}(x, n_1) \iff x \leq n_0) \quad \text{fof}(\text{less}_1, \text{axiom})$

$\forall x: (\text{less}(x, n_2) \iff x \leq n_1) \quad \text{fof}(\text{less}_2, \text{axiom})$

$\forall x: (\text{less}(x, n_3) \iff x \leq n_2) \quad \text{fof}(\text{less}_3, \text{axiom})$

$\forall x: (\text{less}(x, n_4) \iff x \leq n_3) \quad \text{fof}(\text{less}_4, \text{axiom})$

$\forall x: (\text{less}(x, n_5) \iff x \leq n_4) \quad \text{fof}(\text{less}_5, \text{axiom})$

$\forall x: (\text{less}(x, n_6) \iff x \leq n_5) \quad \text{fof}(\text{less}_6, \text{axiom})$

$\forall x: (\text{less}(x, n_7) \iff x \leq n_6) \quad \text{fof}(\text{less}_7, \text{axiom})$

$\forall x: (\text{less}(x, n_8) \iff x \leq n_7) \quad \text{fof}(\text{less}_8, \text{axiom})$
 $\forall x: (\text{less}(x, n_9) \iff x \leq n_8) \quad \text{fof}(\text{less}_9, \text{axiom})$
 $\forall x, y: (\text{less}(x, y) \iff (\neg \text{less}(y, x) \text{ and } y \neq x)) \quad \text{fof}(\text{less_property}, \text{axiom})$
 $\neg \text{holdsAt}(\text{forwards}, n_0) \quad \text{fof}(\text{not_forwards}_0, \text{hypothesis})$
 $\neg \text{holdsAt}(\text{backwards}, n_0) \quad \text{fof}(\text{not_backwards}_0, \text{hypothesis})$
 $\neg \text{holdsAt}(\text{spinning}, n_0) \quad \text{fof}(\text{not_spinning}_0, \text{hypothesis})$
 $\forall \text{fluent, time: } \neg \text{releasedAt}(\text{fluent}, \text{time}) \quad \text{fof}(\text{not_releasedAt}, \text{hypothesis})$
 $\neg \text{holdsAt}(\text{backwards}, n_1) \quad \text{fof}(\text{not_backwards}_1, \text{conjecture})$

CSR016+1.p Forwards at time 1

`include('Axioms/CSR001+0.ax')`
`include('Axioms/CSR001+2.ax')`
 $n_0 + n_0 = n_0 \quad \text{fof}(\text{plus0}_0, \text{axiom})$
 $n_0 + n_1 = n_1 \quad \text{fof}(\text{plus0}_1, \text{axiom})$
 $n_0 + n_2 = n_2 \quad \text{fof}(\text{plus0}_2, \text{axiom})$
 $n_0 + n_3 = n_3 \quad \text{fof}(\text{plus0}_3, \text{axiom})$
 $n_1 + n_1 = n_2 \quad \text{fof}(\text{plus1}_1, \text{axiom})$
 $n_1 + n_2 = n_3 \quad \text{fof}(\text{plus1}_2, \text{axiom})$
 $n_1 + n_3 = n_4 \quad \text{fof}(\text{plus1}_3, \text{axiom})$
 $n_2 + n_2 = n_4 \quad \text{fof}(\text{plus2}_2, \text{axiom})$
 $n_2 + n_3 = n_5 \quad \text{fof}(\text{plus2}_3, \text{axiom})$
 $n_3 + n_3 = n_6 \quad \text{fof}(\text{plus3}_3, \text{axiom})$
 $\forall x, y: x + y = y + x \quad \text{fof}(\text{symmetry_of_plus}, \text{axiom})$
 $\forall x, y: (x \leq y \iff (\text{less}(x, y) \text{ or } x = y)) \quad \text{fof}(\text{less_or_equal}, \text{axiom})$
 $\neg \exists x: \text{less}(x, n_0) \quad \text{fof}(\text{less}_0, \text{axiom})$
 $\forall x: (\text{less}(x, n_1) \iff x \leq n_0) \quad \text{fof}(\text{less}_1, \text{axiom})$
 $\forall x: (\text{less}(x, n_2) \iff x \leq n_1) \quad \text{fof}(\text{less}_2, \text{axiom})$
 $\forall x: (\text{less}(x, n_3) \iff x \leq n_2) \quad \text{fof}(\text{less}_3, \text{axiom})$
 $\forall x: (\text{less}(x, n_4) \iff x \leq n_3) \quad \text{fof}(\text{less}_4, \text{axiom})$
 $\forall x: (\text{less}(x, n_5) \iff x \leq n_4) \quad \text{fof}(\text{less}_5, \text{axiom})$
 $\forall x: (\text{less}(x, n_6) \iff x \leq n_5) \quad \text{fof}(\text{less}_6, \text{axiom})$
 $\forall x: (\text{less}(x, n_7) \iff x \leq n_6) \quad \text{fof}(\text{less}_7, \text{axiom})$
 $\forall x: (\text{less}(x, n_8) \iff x \leq n_7) \quad \text{fof}(\text{less}_8, \text{axiom})$
 $\forall x: (\text{less}(x, n_9) \iff x \leq n_8) \quad \text{fof}(\text{less}_9, \text{axiom})$
 $\forall x, y: (\text{less}(x, y) \iff (\neg \text{less}(y, x) \text{ and } y \neq x)) \quad \text{fof}(\text{less_property}, \text{axiom})$
 $\neg \text{holdsAt}(\text{forwards}, n_0) \quad \text{fof}(\text{not_forwards}_0, \text{hypothesis})$
 $\neg \text{holdsAt}(\text{backwards}, n_0) \quad \text{fof}(\text{not_backwards}_0, \text{hypothesis})$
 $\neg \text{holdsAt}(\text{spinning}, n_0) \quad \text{fof}(\text{not_spinning}_0, \text{hypothesis})$
 $\forall \text{fluent, time: } \neg \text{releasedAt}(\text{fluent}, \text{time}) \quad \text{fof}(\text{not_releasedAt}, \text{hypothesis})$
 $\text{holdsAt}(\text{forwards}, n_1) \quad \text{fof}(\text{forwards}_1, \text{conjecture})$

CSR017+1.p Not spinning at time 1

`include('Axioms/CSR001+0.ax')`
`include('Axioms/CSR001+2.ax')`
 $n_0 + n_0 = n_0 \quad \text{fof}(\text{plus0}_0, \text{axiom})$
 $n_0 + n_1 = n_1 \quad \text{fof}(\text{plus0}_1, \text{axiom})$
 $n_0 + n_2 = n_2 \quad \text{fof}(\text{plus0}_2, \text{axiom})$
 $n_0 + n_3 = n_3 \quad \text{fof}(\text{plus0}_3, \text{axiom})$
 $n_1 + n_1 = n_2 \quad \text{fof}(\text{plus1}_1, \text{axiom})$
 $n_1 + n_2 = n_3 \quad \text{fof}(\text{plus1}_2, \text{axiom})$
 $n_1 + n_3 = n_4 \quad \text{fof}(\text{plus1}_3, \text{axiom})$
 $n_2 + n_2 = n_4 \quad \text{fof}(\text{plus2}_2, \text{axiom})$
 $n_2 + n_3 = n_5 \quad \text{fof}(\text{plus2}_3, \text{axiom})$
 $n_3 + n_3 = n_6 \quad \text{fof}(\text{plus3}_3, \text{axiom})$
 $\forall x, y: x + y = y + x \quad \text{fof}(\text{symmetry_of_plus}, \text{axiom})$
 $\forall x, y: (x \leq y \iff (\text{less}(x, y) \text{ or } x = y)) \quad \text{fof}(\text{less_or_equal}, \text{axiom})$
 $\neg \exists x: \text{less}(x, n_0) \quad \text{fof}(\text{less}_0, \text{axiom})$
 $\forall x: (\text{less}(x, n_1) \iff x \leq n_0) \quad \text{fof}(\text{less}_1, \text{axiom})$
 $\forall x: (\text{less}(x, n_2) \iff x \leq n_1) \quad \text{fof}(\text{less}_2, \text{axiom})$
 $\forall x: (\text{less}(x, n_3) \iff x \leq n_2) \quad \text{fof}(\text{less}_3, \text{axiom})$

$\forall x: (\text{less}(x, n_4) \iff x \leq n_3)$ fof(less₄, axiom)
 $\forall x: (\text{less}(x, n_5) \iff x \leq n_4)$ fof(less₅, axiom)
 $\forall x: (\text{less}(x, n_6) \iff x \leq n_5)$ fof(less₆, axiom)
 $\forall x: (\text{less}(x, n_7) \iff x \leq n_6)$ fof(less₇, axiom)
 $\forall x: (\text{less}(x, n_8) \iff x \leq n_7)$ fof(less₈, axiom)
 $\forall x: (\text{less}(x, n_9) \iff x \leq n_8)$ fof(less₉, axiom)
 $\forall x, y: (\text{less}(x, y) \iff (\neg \text{less}(y, x) \text{ and } y \neq x))$ fof(less_property, axiom)
 $\neg \text{holdsAt}(\text{forwards}, n_0)$ fof(not_forwards₀, hypothesis)
 $\neg \text{holdsAt}(\text{backwards}, n_0)$ fof(not_backwards₀, hypothesis)
 $\neg \text{holdsAt}(\text{spinning}, n_0)$ fof(not_splinning₀, hypothesis)
 $\forall \text{fluent, time: } \neg \text{releasedAt}(\text{fluent}, \text{time})$ fof(not_releasedAt, hypothesis)
 $\neg \text{holdsAt}(\text{spinning}, n_1)$ fof(not_splinning₁, conjecture)

CSR018+1.p Backwards at time 2

include('Axioms/CSR001+0.ax')
include('Axioms/CSR001+2.ax')
 $n_0 + n_0 = n_0$ fof(plus0₀, axiom)
 $n_0 + n_1 = n_1$ fof(plus0₁, axiom)
 $n_0 + n_2 = n_2$ fof(plus0₂, axiom)
 $n_0 + n_3 = n_3$ fof(plus0₃, axiom)
 $n_1 + n_1 = n_2$ fof(plus1₁, axiom)
 $n_1 + n_2 = n_3$ fof(plus1₂, axiom)
 $n_1 + n_3 = n_4$ fof(plus1₃, axiom)
 $n_2 + n_2 = n_4$ fof(plus2₂, axiom)
 $n_2 + n_3 = n_5$ fof(plus2₃, axiom)
 $n_3 + n_3 = n_6$ fof(plus3₃, axiom)
 $\forall x, y: x + y = y + x$ fof(symmetry_of_plus, axiom)
 $\forall x, y: (x \leq y \iff (\text{less}(x, y) \text{ or } x = y))$ fof(less_or_equal, axiom)
 $\neg \exists x: \text{less}(x, n_0)$ fof(less₀, axiom)
 $\forall x: (\text{less}(x, n_1) \iff x \leq n_0)$ fof(less₁, axiom)
 $\forall x: (\text{less}(x, n_2) \iff x \leq n_1)$ fof(less₂, axiom)
 $\forall x: (\text{less}(x, n_3) \iff x \leq n_2)$ fof(less₃, axiom)
 $\forall x: (\text{less}(x, n_4) \iff x \leq n_3)$ fof(less₄, axiom)
 $\forall x: (\text{less}(x, n_5) \iff x \leq n_4)$ fof(less₅, axiom)
 $\forall x: (\text{less}(x, n_6) \iff x \leq n_5)$ fof(less₆, axiom)
 $\forall x: (\text{less}(x, n_7) \iff x \leq n_6)$ fof(less₇, axiom)
 $\forall x: (\text{less}(x, n_8) \iff x \leq n_7)$ fof(less₈, axiom)
 $\forall x: (\text{less}(x, n_9) \iff x \leq n_8)$ fof(less₉, axiom)
 $\forall x, y: (\text{less}(x, y) \iff (\neg \text{less}(y, x) \text{ and } y \neq x))$ fof(less_property, axiom)
 $\neg \text{holdsAt}(\text{forwards}, n_0)$ fof(not_forwards₀, hypothesis)
 $\neg \text{holdsAt}(\text{backwards}, n_0)$ fof(not_backwards₀, hypothesis)
 $\neg \text{holdsAt}(\text{spinning}, n_0)$ fof(not_splinning₀, hypothesis)
 $\forall \text{fluent, time: } \neg \text{releasedAt}(\text{fluent}, \text{time})$ fof(not_releasedAt, hypothesis)
 $\text{holdsAt}(\text{backwards}, n_2)$ fof(backwards₂, conjecture)

CSR019+1.p Not forwards at time 2

include('Axioms/CSR001+0.ax')
include('Axioms/CSR001+2.ax')
 $n_0 + n_0 = n_0$ fof(plus0₀, axiom)
 $n_0 + n_1 = n_1$ fof(plus0₁, axiom)
 $n_0 + n_2 = n_2$ fof(plus0₂, axiom)
 $n_0 + n_3 = n_3$ fof(plus0₃, axiom)
 $n_1 + n_1 = n_2$ fof(plus1₁, axiom)
 $n_1 + n_2 = n_3$ fof(plus1₂, axiom)
 $n_1 + n_3 = n_4$ fof(plus1₃, axiom)
 $n_2 + n_2 = n_4$ fof(plus2₂, axiom)
 $n_2 + n_3 = n_5$ fof(plus2₃, axiom)
 $n_3 + n_3 = n_6$ fof(plus3₃, axiom)
 $\forall x, y: x + y = y + x$ fof(symmetry_of_plus, axiom)
 $\forall x, y: (x \leq y \iff (\text{less}(x, y) \text{ or } x = y))$ fof(less_or_equal, axiom)

$\neg \exists x: \text{less}(x, n_0) \quad \text{fof}(\text{less}_0, \text{axiom})$
 $\forall x: (\text{less}(x, n_1) \iff x \leq n_0) \quad \text{fof}(\text{less}_1, \text{axiom})$
 $\forall x: (\text{less}(x, n_2) \iff x \leq n_1) \quad \text{fof}(\text{less}_2, \text{axiom})$
 $\forall x: (\text{less}(x, n_3) \iff x \leq n_2) \quad \text{fof}(\text{less}_3, \text{axiom})$
 $\forall x: (\text{less}(x, n_4) \iff x \leq n_3) \quad \text{fof}(\text{less}_4, \text{axiom})$
 $\forall x: (\text{less}(x, n_5) \iff x \leq n_4) \quad \text{fof}(\text{less}_5, \text{axiom})$
 $\forall x: (\text{less}(x, n_6) \iff x \leq n_5) \quad \text{fof}(\text{less}_6, \text{axiom})$
 $\forall x: (\text{less}(x, n_7) \iff x \leq n_6) \quad \text{fof}(\text{less}_7, \text{axiom})$
 $\forall x: (\text{less}(x, n_8) \iff x \leq n_7) \quad \text{fof}(\text{less}_8, \text{axiom})$
 $\forall x: (\text{less}(x, n_9) \iff x \leq n_8) \quad \text{fof}(\text{less}_9, \text{axiom})$
 $\forall x, y: (\text{less}(x, y) \iff (\neg \text{less}(y, x) \text{ and } y \neq x)) \quad \text{fof}(\text{less_property}, \text{axiom})$
 $\neg \text{holdsAt}(\text{forwards}, n_0) \quad \text{fof}(\text{not_forwards}_0, \text{hypothesis})$
 $\neg \text{holdsAt}(\text{backwards}, n_0) \quad \text{fof}(\text{not_backwards}_0, \text{hypothesis})$
 $\neg \text{holdsAt}(\text{spinning}, n_0) \quad \text{fof}(\text{not_splinning}_0, \text{hypothesis})$
 $\forall \text{fluent, time: } \neg \text{releasedAt}(\text{fluent}, \text{time}) \quad \text{fof}(\text{not_releasedAt}, \text{hypothesis})$
 $\neg \text{holdsAt}(\text{forwards}, n_2) \quad \text{fof}(\text{not_forwards}_2, \text{conjecture})$

CSR020+1.p Not spinning at time 2

`include('Axioms/CSR001+0.ax')`
`include('Axioms/CSR001+2.ax')`
 $n_0 + n_0 = n_0 \quad \text{fof}(\text{plus}_0_0, \text{axiom})$
 $n_0 + n_1 = n_1 \quad \text{fof}(\text{plus}_0_1, \text{axiom})$
 $n_0 + n_2 = n_2 \quad \text{fof}(\text{plus}_0_2, \text{axiom})$
 $n_0 + n_3 = n_3 \quad \text{fof}(\text{plus}_0_3, \text{axiom})$
 $n_1 + n_1 = n_2 \quad \text{fof}(\text{plus}_1_1, \text{axiom})$
 $n_1 + n_2 = n_3 \quad \text{fof}(\text{plus}_1_2, \text{axiom})$
 $n_1 + n_3 = n_4 \quad \text{fof}(\text{plus}_1_3, \text{axiom})$
 $n_2 + n_2 = n_4 \quad \text{fof}(\text{plus}_2_2, \text{axiom})$
 $n_2 + n_3 = n_5 \quad \text{fof}(\text{plus}_2_3, \text{axiom})$
 $n_3 + n_3 = n_6 \quad \text{fof}(\text{plus}_3_3, \text{axiom})$
 $\forall x, y: x + y = y + x \quad \text{fof}(\text{symmetry_of_plus}, \text{axiom})$
 $\forall x, y: (x \leq y \iff (\text{less}(x, y) \text{ or } x = y)) \quad \text{fof}(\text{less_or_equal}, \text{axiom})$
 $\neg \exists x: \text{less}(x, n_0) \quad \text{fof}(\text{less}_0, \text{axiom})$
 $\forall x: (\text{less}(x, n_1) \iff x \leq n_0) \quad \text{fof}(\text{less}_1, \text{axiom})$
 $\forall x: (\text{less}(x, n_2) \iff x \leq n_1) \quad \text{fof}(\text{less}_2, \text{axiom})$
 $\forall x: (\text{less}(x, n_3) \iff x \leq n_2) \quad \text{fof}(\text{less}_3, \text{axiom})$
 $\forall x: (\text{less}(x, n_4) \iff x \leq n_3) \quad \text{fof}(\text{less}_4, \text{axiom})$
 $\forall x: (\text{less}(x, n_5) \iff x \leq n_4) \quad \text{fof}(\text{less}_5, \text{axiom})$
 $\forall x: (\text{less}(x, n_6) \iff x \leq n_5) \quad \text{fof}(\text{less}_6, \text{axiom})$
 $\forall x: (\text{less}(x, n_7) \iff x \leq n_6) \quad \text{fof}(\text{less}_7, \text{axiom})$
 $\forall x: (\text{less}(x, n_8) \iff x \leq n_7) \quad \text{fof}(\text{less}_8, \text{axiom})$
 $\forall x: (\text{less}(x, n_9) \iff x \leq n_8) \quad \text{fof}(\text{less}_9, \text{axiom})$
 $\forall x, y: (\text{less}(x, y) \iff (\neg \text{less}(y, x) \text{ and } y \neq x)) \quad \text{fof}(\text{less_property}, \text{axiom})$
 $\neg \text{holdsAt}(\text{forwards}, n_0) \quad \text{fof}(\text{not_forwards}_0, \text{hypothesis})$
 $\neg \text{holdsAt}(\text{backwards}, n_0) \quad \text{fof}(\text{not_backwards}_0, \text{hypothesis})$
 $\neg \text{holdsAt}(\text{spinning}, n_0) \quad \text{fof}(\text{not_splinning}_0, \text{hypothesis})$
 $\forall \text{fluent, time: } \neg \text{releasedAt}(\text{fluent}, \text{time}) \quad \text{fof}(\text{not_releasedAt}, \text{hypothesis})$
 $\neg \text{holdsAt}(\text{spinning}, n_2) \quad \text{fof}(\text{not_spinning}_2, \text{conjecture})$

CSR021+1.p Not backwards at time 3

`include('Axioms/CSR001+0.ax')`
`include('Axioms/CSR001+2.ax')`
 $n_0 + n_0 = n_0 \quad \text{fof}(\text{plus}_0_0, \text{axiom})$
 $n_0 + n_1 = n_1 \quad \text{fof}(\text{plus}_0_1, \text{axiom})$
 $n_0 + n_2 = n_2 \quad \text{fof}(\text{plus}_0_2, \text{axiom})$
 $n_0 + n_3 = n_3 \quad \text{fof}(\text{plus}_0_3, \text{axiom})$
 $n_1 + n_1 = n_2 \quad \text{fof}(\text{plus}_1_1, \text{axiom})$
 $n_1 + n_2 = n_3 \quad \text{fof}(\text{plus}_1_2, \text{axiom})$
 $n_1 + n_3 = n_4 \quad \text{fof}(\text{plus}_1_3, \text{axiom})$
 $n_2 + n_2 = n_4 \quad \text{fof}(\text{plus}_2_2, \text{axiom})$

$n_2 + n_3 = n_5$ fof(plus2₃, axiom)
 $n_3 + n_3 = n_6$ fof(plus3₃, axiom)
 $\forall x, y: x + y = y + x$ fof(symmetry_of_plus, axiom)
 $\forall x, y: (x \leq y \iff (\text{less}(x, y) \text{ or } x = y))$ fof(less_or_equal, axiom)
 $\neg \exists x: \text{less}(x, n_0)$ fof(less₀, axiom)
 $\forall x: (\text{less}(x, n_1) \iff x \leq n_0)$ fof(less₁, axiom)
 $\forall x: (\text{less}(x, n_2) \iff x \leq n_1)$ fof(less₂, axiom)
 $\forall x: (\text{less}(x, n_3) \iff x \leq n_2)$ fof(less₃, axiom)
 $\forall x: (\text{less}(x, n_4) \iff x \leq n_3)$ fof(less₄, axiom)
 $\forall x: (\text{less}(x, n_5) \iff x \leq n_4)$ fof(less₅, axiom)
 $\forall x: (\text{less}(x, n_6) \iff x \leq n_5)$ fof(less₆, axiom)
 $\forall x: (\text{less}(x, n_7) \iff x \leq n_6)$ fof(less₇, axiom)
 $\forall x: (\text{less}(x, n_8) \iff x \leq n_7)$ fof(less₈, axiom)
 $\forall x: (\text{less}(x, n_9) \iff x \leq n_8)$ fof(less₉, axiom)
 $\forall x, y: (\text{less}(x, y) \iff (\neg \text{less}(y, x) \text{ and } y \neq x))$ fof(less_property, axiom)
 $\neg \text{holdsAt}(\text{forwards}, n_0)$ fof(not_forwards₀, hypothesis)
 $\neg \text{holdsAt}(\text{backwards}, n_0)$ fof(not_backwards₀, hypothesis)
 $\neg \text{holdsAt}(\text{spinning}, n_0)$ fof(not_splinning₀, hypothesis)
 $\forall \text{fluent, time: } \neg \text{releasedAt}(\text{fluent}, \text{time})$ fof(not_releasedAt, hypothesis)
 $\neg \text{holdsAt}(\text{backwards}, n_3)$ fof(not_backwards₃, conjecture)

CSR022+1.p Not forwards at time 3

include('Axioms/CSR001+0.ax')
include('Axioms/CSR001+2.ax')
 $n_0 + n_0 = n_0$ fof(plus0₀, axiom)
 $n_0 + n_1 = n_1$ fof(plus0₁, axiom)
 $n_0 + n_2 = n_2$ fof(plus0₂, axiom)
 $n_0 + n_3 = n_3$ fof(plus0₃, axiom)
 $n_1 + n_1 = n_2$ fof(plus1₁, axiom)
 $n_1 + n_2 = n_3$ fof(plus1₂, axiom)
 $n_1 + n_3 = n_4$ fof(plus1₃, axiom)
 $n_2 + n_2 = n_4$ fof(plus2₂, axiom)
 $n_2 + n_3 = n_5$ fof(plus2₃, axiom)
 $n_3 + n_3 = n_6$ fof(plus3₃, axiom)
 $\forall x, y: x + y = y + x$ fof(symmetry_of_plus, axiom)
 $\forall x, y: (x \leq y \iff (\text{less}(x, y) \text{ or } x = y))$ fof(less_or_equal, axiom)
 $\neg \exists x: \text{less}(x, n_0)$ fof(less₀, axiom)
 $\forall x: (\text{less}(x, n_1) \iff x \leq n_0)$ fof(less₁, axiom)
 $\forall x: (\text{less}(x, n_2) \iff x \leq n_1)$ fof(less₂, axiom)
 $\forall x: (\text{less}(x, n_3) \iff x \leq n_2)$ fof(less₃, axiom)
 $\forall x: (\text{less}(x, n_4) \iff x \leq n_3)$ fof(less₄, axiom)
 $\forall x: (\text{less}(x, n_5) \iff x \leq n_4)$ fof(less₅, axiom)
 $\forall x: (\text{less}(x, n_6) \iff x \leq n_5)$ fof(less₆, axiom)
 $\forall x: (\text{less}(x, n_7) \iff x \leq n_6)$ fof(less₇, axiom)
 $\forall x: (\text{less}(x, n_8) \iff x \leq n_7)$ fof(less₈, axiom)
 $\forall x: (\text{less}(x, n_9) \iff x \leq n_8)$ fof(less₉, axiom)
 $\forall x, y: (\text{less}(x, y) \iff (\neg \text{less}(y, x) \text{ and } y \neq x))$ fof(less_property, axiom)
 $\neg \text{holdsAt}(\text{forwards}, n_0)$ fof(not_forwards₀, hypothesis)
 $\neg \text{holdsAt}(\text{backwards}, n_0)$ fof(not_backwards₀, hypothesis)
 $\neg \text{holdsAt}(\text{spinning}, n_0)$ fof(not_splinning₀, hypothesis)
 $\forall \text{fluent, time: } \neg \text{releasedAt}(\text{fluent}, \text{time})$ fof(not_releasedAt, hypothesis)
 $\neg \text{holdsAt}(\text{forwards}, n_3)$ fof(not_forwards₃, conjecture)

CSR023+1.p Spinning at time 3

include('Axioms/CSR001+0.ax')
include('Axioms/CSR001+2.ax')
 $n_0 + n_0 = n_0$ fof(plus0₀, axiom)
 $n_0 + n_1 = n_1$ fof(plus0₁, axiom)
 $n_0 + n_2 = n_2$ fof(plus0₂, axiom)
 $n_0 + n_3 = n_3$ fof(plus0₃, axiom)

$n_1 + n_1 = n_2$ fof(plus1₁, axiom)
 $n_1 + n_2 = n_3$ fof(plus1₂, axiom)
 $n_1 + n_3 = n_4$ fof(plus1₃, axiom)
 $n_2 + n_2 = n_4$ fof(plus2₂, axiom)
 $n_2 + n_3 = n_5$ fof(plus2₃, axiom)
 $n_3 + n_3 = n_6$ fof(plus3₃, axiom)
 $\forall x, y: x + y = y + x$ fof(symmetry_of_plus, axiom)
 $\forall x, y: (x \leq y \iff (\text{less}(x, y) \text{ or } x = y))$ fof(less_or_equal, axiom)
 $\neg \exists x: \text{less}(x, n_0)$ fof(less₀, axiom)
 $\forall x: (\text{less}(x, n_1) \iff x \leq n_0)$ fof(less₁, axiom)
 $\forall x: (\text{less}(x, n_2) \iff x \leq n_1)$ fof(less₂, axiom)
 $\forall x: (\text{less}(x, n_3) \iff x \leq n_2)$ fof(less₃, axiom)
 $\forall x: (\text{less}(x, n_4) \iff x \leq n_3)$ fof(less₄, axiom)
 $\forall x: (\text{less}(x, n_5) \iff x \leq n_4)$ fof(less₅, axiom)
 $\forall x: (\text{less}(x, n_6) \iff x \leq n_5)$ fof(less₆, axiom)
 $\forall x: (\text{less}(x, n_7) \iff x \leq n_6)$ fof(less₇, axiom)
 $\forall x: (\text{less}(x, n_8) \iff x \leq n_7)$ fof(less₈, axiom)
 $\forall x: (\text{less}(x, n_9) \iff x \leq n_8)$ fof(less₉, axiom)
 $\forall x, y: (\text{less}(x, y) \iff (\neg \text{less}(y, x) \text{ and } y \neq x))$ fof(less_property, axiom)
 $\neg \text{holdsAt}(\text{forwards}, n_0)$ fof(not_forwards₀, hypothesis)
 $\neg \text{holdsAt}(\text{backwards}, n_0)$ fof(not_backwards₀, hypothesis)
 $\neg \text{holdsAt}(\text{spinning}, n_0)$ fof(not_splinning₀, hypothesis)
 $\forall \text{fluent, time: } \neg \text{releasedAt}(\text{fluent}, \text{time})$ fof(not_releasedAt, hypothesis)
 $\text{holdsAt}(\text{spinning}, n_3)$ fof(spinning₃, conjecture)

CSR025+2.p Autogenerated Cyc Problem CSR025+2

include('Axioms/CSR002+1.ax')
mtvisible(c_patterndetectormt) \Rightarrow gens(c_tptpcol_16₁₃₀₉₃₃, c_tptpcol_15₁₃₀₉₃₁) fof(query₇₅, conjecture)

CSR025+3.p Autogenerated Cyc Problem CSR025+3

include('Axioms/CSR002+2.ax')
mtvisible(c_patterndetectormt) \Rightarrow gens(c_tptpcol_16₁₃₀₉₃₃, c_tptpcol_15₁₃₀₉₃₁) fof(query₁₂₅, conjecture)

CSR025+4.p Autogenerated Cyc Problem CSR025+4

include('Axioms/CSR002+3.ax')
mtvisible(c_patterndetectormt) \Rightarrow gens(c_tptpcol_16₁₃₀₉₃₃, c_tptpcol_15₁₃₀₉₃₁) fof(query₁₇₅, conjecture)

CSR025+5.p Autogenerated Cyc Problem CSR025+5

include('Axioms/CSR002+4.ax')
mtvisible(c_patterndetectormt) \Rightarrow gens(c_tptpcol_16₁₃₀₉₃₃, c_tptpcol_15₁₃₀₉₃₁) fof(query₂₂₅, conjecture)

CSR025+6.p Autogenerated Cyc Problem CSR025+6

include('Axioms/CSR002+5.ax')
mtvisible(c_patterndetectormt) \Rightarrow gens(c_tptpcol_16₁₃₀₉₃₃, c_tptpcol_15₁₃₀₉₃₁) fof(query₂₇₅, conjecture)

CSR026+2.p Autogenerated Cyc Problem CSR026+2

include('Axioms/CSR002+1.ax')
mtvisible(c_tptp_spindlecollectormt) \Rightarrow tptpfobject(c_tptprunningsshorts, f_tptpquantityfn₂(n₇₅₆)) fof(query₇₆, conjecture)

CSR026+3.p Autogenerated Cyc Problem CSR026+3

include('Axioms/CSR002+2.ax')
mtvisible(c_tptp_spindlecollectormt) \Rightarrow tptpfobject(c_tptprunningsshorts, f_tptpquantityfn₂(n₇₅₆)) fof(query₁₂₆, conjecture)

CSR026+4.p Autogenerated Cyc Problem CSR026+4

include('Axioms/CSR002+3.ax')
mtvisible(c_tptp_spindlecollectormt) \Rightarrow tptpfobject(c_tptprunningsshorts, f_tptpquantityfn₂(n₇₅₆)) fof(query₁₇₆, conjecture)

CSR026+5.p Autogenerated Cyc Problem CSR026+5

include('Axioms/CSR002+4.ax')
mtvisible(c_tptp_spindlecollectormt) \Rightarrow tptpfobject(c_tptprunningsshorts, f_tptpquantityfn₂(n₇₅₆)) fof(query₂₂₆, conjecture)

CSR026+6.p Autogenerated Cyc Problem CSR026+6

include('Axioms/CSR002+5.ax')
mtvisible(c_tptp_spindlecollectormt) \Rightarrow tptpfobject(c_tptprunningsshorts, f_tptpquantityfn₂(n₇₅₆)) fof(query₂₇₆, conjecture)

CSR027+2.p Autogenerated Cyc Problem CSR027+2

include('Axioms/CSR002+1.ax')

$\exists x: (\text{mtvisible}(c_tptp_spindlecollectormt) \Rightarrow (\text{tptp_8}_{875}(c_tptp\text{subcollectionofwithrelationfromtypefnunitvectorintervaldirect}$

CSR027+3.p Autogenerated Cyc Problem CSR027+3

include('Axioms/CSR002+2.ax')

$\exists x: (\text{mtvisible}(c_tptp_spindlecollectormt) \Rightarrow (\text{tptp_8}_{875}(c_tptp\text{subcollectionofwithrelationfromtypefnunitvectorintervaldirect}$

CSR027+4.p Autogenerated Cyc Problem CSR027+4

include('Axioms/CSR002+3.ax')

$\exists x: (\text{mtvisible}(c_tptp_spindlecollectormt) \Rightarrow (\text{tptp_8}_{875}(c_tptp\text{subcollectionofwithrelationfromtypefnunitvectorintervaldirect}$

CSR027+5.p Autogenerated Cyc Problem CSR027+5

include('Axioms/CSR002+4.ax')

$\exists x: (\text{mtvisible}(c_tptp_spindlecollectormt) \Rightarrow (\text{tptp_8}_{875}(c_tptp\text{subcollectionofwithrelationfromtypefnunitvectorintervaldirect}$

CSR027+6.p Autogenerated Cyc Problem CSR027+6

include('Axioms/CSR002+5.ax')

$\exists x: (\text{mtvisible}(c_tptp_spindlecollectormt) \Rightarrow (\text{tptp_8}_{875}(c_tptp\text{subcollectionofwithrelationfromtypefnunitvectorintervaldirect}$

CSR028+2.p Autogenerated Cyc Problem CSR028+2

include('Axioms/CSR002+1.ax')

$\text{mtvisible}(c_tptp_member2089_mt) \Rightarrow \text{individual}(c_tptptptpcol_16_{25985}) \quad \text{fof}(\text{query}_{78}, \text{conjecture})$

CSR028+3.p Autogenerated Cyc Problem CSR028+3

include('Axioms/CSR002+2.ax')

$\text{mtvisible}(c_tptp_member2089_mt) \Rightarrow \text{individual}(c_tptptptpcol_16_{25985}) \quad \text{fof}(\text{query}_{128}, \text{conjecture})$

CSR028+4.p Autogenerated Cyc Problem CSR028+4

include('Axioms/CSR002+3.ax')

$\text{mtvisible}(c_tptp_member2089_mt) \Rightarrow \text{individual}(c_tptptptpcol_16_{25985}) \quad \text{fof}(\text{query}_{178}, \text{conjecture})$

CSR028+5.p Autogenerated Cyc Problem CSR028+5

include('Axioms/CSR002+4.ax')

$\text{mtvisible}(c_tptp_member2089_mt) \Rightarrow \text{individual}(c_tptptptpcol_16_{25985}) \quad \text{fof}(\text{query}_{228}, \text{conjecture})$

CSR028+6.p Autogenerated Cyc Problem CSR028+6

include('Axioms/CSR002+5.ax')

$\text{mtvisible}(c_tptp_member2089_mt) \Rightarrow \text{individual}(c_tptptptpcol_16_{25985}) \quad \text{fof}(\text{query}_{278}, \text{conjecture})$

CSR029+2.p Autogenerated Cyc Problem CSR029+2

include('Axioms/CSR002+1.ax')

$\text{mtvisible}(c_tptpgeo_member3_mt) \Rightarrow (\text{inregion}(c_geolocation_x14_y39, c_georegion_l3_x4_y13) \text{ and } \text{geolevel}_3(c_georegion_l3_x4$

CSR029+3.p Autogenerated Cyc Problem CSR029+3

include('Axioms/CSR002+2.ax')

$\text{mtvisible}(c_tptpgeo_member3_mt) \Rightarrow (\text{inregion}(c_geolocation_x14_y39, c_georegion_l3_x4_y13) \text{ and } \text{geolevel}_3(c_georegion_l3_x4$

CSR029+4.p Autogenerated Cyc Problem CSR029+4

include('Axioms/CSR002+3.ax')

$\text{mtvisible}(c_tptpgeo_member3_mt) \Rightarrow (\text{inregion}(c_geolocation_x14_y39, c_georegion_l3_x4_y13) \text{ and } \text{geolevel}_3(c_georegion_l3_x4$

CSR029+5.p Autogenerated Cyc Problem CSR029+5

include('Axioms/CSR002+4.ax')

$\text{mtvisible}(c_tptpgeo_member3_mt) \Rightarrow (\text{inregion}(c_geolocation_x14_y39, c_georegion_l3_x4_y13) \text{ and } \text{geolevel}_3(c_georegion_l3_x4$

CSR029+6.p Autogenerated Cyc Problem CSR029+6

include('Axioms/CSR002+5.ax')

$\text{mtvisible}(c_tptpgeo_member3_mt) \Rightarrow (\text{inregion}(c_geolocation_x14_y39, c_georegion_l3_x4_y13) \text{ and } \text{geolevel}_3(c_georegion_l3_x4$

CSR030+2.p Autogenerated Cyc Problem CSR030+2

include('Axioms/CSR002+1.ax')

$\exists aRG_2: (\text{mtvisible}(c_tptp_member3393_mt) \Rightarrow \text{tptptypes}_{5387}(aRG_2, c_pushingwithopenhand)) \quad \text{fof}(\text{query}_{80}, \text{conjecture})$

CSR030+3.p Autogenerated Cyc Problem CSR030+3

include('Axioms/CSR002+2.ax')

$\exists aRG_2: (\text{mtvisible}(c_tptp_member3393_mt) \Rightarrow \text{tptptypes}_{5387}(aRG_2, c_pushingwithopenhand)) \quad \text{fof}(\text{query}_{130}, \text{conjecture})$

CSR030+4.p Autogenerated Cyc Problem CSR030+4

include('Axioms/CSR002+3.ax')

$\exists aRG_2: (\text{mtvisible}(c_tptp_member3393_mt) \Rightarrow \text{tptptypes}_{5387}(aRG_2, c_pushingwithopenhand)) \quad \text{fof}(\text{query}_{180}, \text{conjecture})$

CSR030+5.p Autogenerated Cyc Problem CSR030+5
include('Axioms/CSR002+4.ax')
 $\exists aRG_2: (mtvisible(c_tptp_member3393_mt) \Rightarrow tptptypes_5387(aRG_2, c_pushingwithopenhand))$ fof(query₂₃₀, conjecture)

CSR030+6.p Autogenerated Cyc Problem CSR030+6
include('Axioms/CSR002+5.ax')
 $\exists aRG_2: (mtvisible(c_tptp_member3393_mt) \Rightarrow tptptypes_5387(aRG_2, c_pushingwithopenhand))$ fof(query₂₈₀, conjecture)

CSR031+2.p Autogenerated Cyc Problem CSR031+2
include('Axioms/CSR002+1.ax')
 $\neg disjointwith(c_tptptptpcol_168398, c_tptpcol_1618488)$ fof(query₈₁, conjecture)

CSR031+3.p Autogenerated Cyc Problem CSR031+3
include('Axioms/CSR002+2.ax')
 $\neg disjointwith(c_tptptptpcol_168398, c_tptpcol_1618488)$ fof(query₁₃₁, conjecture)

CSR031+4.p Autogenerated Cyc Problem CSR031+4
include('Axioms/CSR002+3.ax')
 $\neg disjointwith(c_tptptptpcol_168398, c_tptpcol_1618488)$ fof(query₁₈₁, conjecture)

CSR031+5.p Autogenerated Cyc Problem CSR031+5
include('Axioms/CSR002+4.ax')
 $\neg disjointwith(c_tptptptpcol_168398, c_tptpcol_1618488)$ fof(query₂₃₁, conjecture)

CSR031+6.p Autogenerated Cyc Problem CSR031+6
include('Axioms/CSR002+5.ax')
 $\neg disjointwith(c_tptptptpcol_168398, c_tptpcol_1618488)$ fof(query₂₈₁, conjecture)

CSR032+2.p Autogenerated Cyc Problem CSR032+2
include('Axioms/CSR002+1.ax')
 $\exists cOL: (mtvisible(c_reasoningaboutpossibleantecedentsmt) \Rightarrow isa(f_citynamedfn(s_agen, c_france), cOL))$ fof(query₈₂, conjecture)

CSR032+3.p Autogenerated Cyc Problem CSR032+3
include('Axioms/CSR002+2.ax')
 $\exists cOL: (mtvisible(c_reasoningaboutpossibleantecedentsmt) \Rightarrow isa(f_citynamedfn(s_agen, c_france), cOL))$ fof(query₁₃₂, conjecture)

CSR032+4.p Autogenerated Cyc Problem CSR032+4
include('Axioms/CSR002+3.ax')
 $\exists cOL: (mtvisible(c_reasoningaboutpossibleantecedentsmt) \Rightarrow isa(f_citynamedfn(s_agen, c_france), cOL))$ fof(query₁₈₂, conjecture)

CSR032+5.p Autogenerated Cyc Problem CSR032+5
include('Axioms/CSR002+4.ax')
 $\exists cOL: (mtvisible(c_reasoningaboutpossibleantecedentsmt) \Rightarrow isa(f_citynamedfn(s_agen, c_france), cOL))$ fof(query₂₃₂, conjecture)

CSR032+6.p Autogenerated Cyc Problem CSR032+6
include('Axioms/CSR002+5.ax')
 $\exists cOL: (mtvisible(c_reasoningaboutpossibleantecedentsmt) \Rightarrow isa(f_citynamedfn(s_agen, c_france), cOL))$ fof(query₂₈₂, conjecture)

CSR033+2.p Autogenerated Cyc Problem CSR033+2
include('Axioms/CSR002+1.ax')
 $mtvisible(c_tptpgeo_spindlecollectormt) \Rightarrow (inregion(c_geolocation_x76_y23, c_georegion_l1_x2_y0) \text{ and } geolevel_1(c_georegion_l1_x2_y0))$

CSR033+3.p Autogenerated Cyc Problem CSR033+3
include('Axioms/CSR002+2.ax')
 $mtvisible(c_tptpgeo_spindlecollectormt) \Rightarrow (inregion(c_geolocation_x76_y23, c_georegion_l1_x2_y0) \text{ and } geolevel_1(c_georegion_l1_x2_y0))$

CSR033+4.p Autogenerated Cyc Problem CSR033+4
include('Axioms/CSR002+3.ax')
 $mtvisible(c_tptpgeo_spindlecollectormt) \Rightarrow (inregion(c_geolocation_x76_y23, c_georegion_l1_x2_y0) \text{ and } geolevel_1(c_georegion_l1_x2_y0))$

CSR033+5.p Autogenerated Cyc Problem CSR033+5
include('Axioms/CSR002+4.ax')
 $mtvisible(c_tptpgeo_spindlecollectormt) \Rightarrow (inregion(c_geolocation_x76_y23, c_georegion_l1_x2_y0) \text{ and } geolevel_1(c_georegion_l1_x2_y0))$

CSR033+6.p Autogenerated Cyc Problem CSR033+6
include('Axioms/CSR002+5.ax')
 $mtvisible(c_tptpgeo_spindlecollectormt) \Rightarrow (inregion(c_geolocation_x76_y23, c_georegion_l1_x2_y0) \text{ and } geolevel_1(c_georegion_l1_x2_y0))$

CSR034+2.p Autogenerated Cyc Problem CSR034+2
include('Axioms/CSR002+1.ax')

$\exists cOL: (mtvisible(c.tptp_member3515_mt) \Rightarrow isa(c.wanica_districtsuriname, cOL))$ $fof(query_{84}, conjecture)$
CSR034+3.p Autogenerated Cyc Problem CSR034+3
include('Axioms/CSR002+2.ax')
 $\exists cOL: (mtvisible(c.tptp_member3515_mt) \Rightarrow isa(c.wanica_districtsuriname, cOL))$ $fof(query_{134}, conjecture)$
CSR034+4.p Autogenerated Cyc Problem CSR034+4
include('Axioms/CSR002+3.ax')
 $\exists cOL: (mtvisible(c.tptp_member3515_mt) \Rightarrow isa(c.wanica_districtsuriname, cOL))$ $fof(query_{184}, conjecture)$
CSR034+5.p Autogenerated Cyc Problem CSR034+5
include('Axioms/CSR002+4.ax')
 $\exists cOL: (mtvisible(c.tptp_member3515_mt) \Rightarrow isa(c.wanica_districtsuriname, cOL))$ $fof(query_{234}, conjecture)$
CSR034+6.p Autogenerated Cyc Problem CSR034+6
include('Axioms/CSR002+5.ax')
 $\exists cOL: (mtvisible(c.tptp_member3515_mt) \Rightarrow isa(c.wanica_districtsuriname, cOL))$ $fof(query_{284}, conjecture)$
CSR035+2.p Autogenerated Cyc Problem CSR035+2
include('Axioms/CSR002+1.ax')
 $\exists x: (mtvisible(c.englishmt) \Rightarrow prettystring(f_instancewithrelationtofn(c_footballteam, c_affiliatedwith, c_beloitcollege), x))$
CSR035+3.p Autogenerated Cyc Problem CSR035+3
include('Axioms/CSR002+2.ax')
 $\exists x: (mtvisible(c.englishmt) \Rightarrow prettystring(f_instancewithrelationtofn(c_footballteam, c_affiliatedwith, c_beloitcollege), x))$
CSR035+4.p Autogenerated Cyc Problem CSR035+4
include('Axioms/CSR002+3.ax')
 $\exists x: (mtvisible(c.englishmt) \Rightarrow prettystring(f_instancewithrelationtofn(c_footballteam, c_affiliatedwith, c_beloitcollege), x))$
CSR035+5.p Autogenerated Cyc Problem CSR035+5
include('Axioms/CSR002+4.ax')
 $\exists x: (mtvisible(c.englishmt) \Rightarrow prettystring(f_instancewithrelationtofn(c_footballteam, c_affiliatedwith, c_beloitcollege), x))$
CSR035+6.p Autogenerated Cyc Problem CSR035+6
include('Axioms/CSR002+5.ax')
 $\exists x: (mtvisible(c.englishmt) \Rightarrow prettystring(f_instancewithrelationtofn(c_footballteam, c_affiliatedwith, c_beloitcollege), x))$
CSR036+2.p Autogenerated Cyc Problem CSR036+2
include('Axioms/CSR002+1.ax')
 $mtvisible(c.tptp_member974_mt) \Rightarrow disjointwith(c.tptpcol.15_{22076}, c.tptpcol.16_{72795})$ $fof(query_{86}, conjecture)$
CSR036+3.p Autogenerated Cyc Problem CSR036+3
include('Axioms/CSR002+2.ax')
 $mtvisible(c.tptp_member974_mt) \Rightarrow disjointwith(c.tptpcol.15_{22076}, c.tptpcol.16_{72795})$ $fof(query_{136}, conjecture)$
CSR036+4.p Autogenerated Cyc Problem CSR036+4
include('Axioms/CSR002+3.ax')
 $mtvisible(c.tptp_member974_mt) \Rightarrow disjointwith(c.tptpcol.15_{22076}, c.tptpcol.16_{72795})$ $fof(query_{186}, conjecture)$
CSR036+5.p Autogenerated Cyc Problem CSR036+5
include('Axioms/CSR002+4.ax')
 $mtvisible(c.tptp_member974_mt) \Rightarrow disjointwith(c.tptpcol.15_{22076}, c.tptpcol.16_{72795})$ $fof(query_{236}, conjecture)$
CSR036+6.p Autogenerated Cyc Problem CSR036+6
include('Axioms/CSR002+5.ax')
 $mtvisible(c.tptp_member974_mt) \Rightarrow disjointwith(c.tptpcol.15_{22076}, c.tptpcol.16_{72795})$ $fof(query_{286}, conjecture)$
CSR037+2.p Autogenerated Cyc Problem CSR037+2
include('Axioms/CSR002+1.ax')
 $mtvisible(c.tptpgeo_member7_mt) \Rightarrow geographicalsubregions(c_georegion.l2_x5_y8, c_georegion.l4_x45_y72)$ $fof(query_{87}, conjecture)$
CSR037+3.p Autogenerated Cyc Problem CSR037+3
include('Axioms/CSR002+2.ax')
 $mtvisible(c.tptpgeo_member7_mt) \Rightarrow geographicalsubregions(c_georegion.l2_x5_y8, c_georegion.l4_x45_y72)$ $fof(query_{137}, conjecture)$
CSR037+4.p Autogenerated Cyc Problem CSR037+4
include('Axioms/CSR002+3.ax')
 $mtvisible(c.tptpgeo_member7_mt) \Rightarrow geographicalsubregions(c_georegion.l2_x5_y8, c_georegion.l4_x45_y72)$ $fof(query_{187}, conjecture)$
CSR037+5.p Autogenerated Cyc Problem CSR037+5

include('Axioms/CSR002+4.ax')

mtvisible(c_tptpgeo_member7_mt) \Rightarrow geographicalsubregions(c_georegion_l2_x5_y8, c_georegion_l4_x45_y72) fof(query₂₃₇,

CSR037+6.p Autogenerated Cyc Problem CSR037+6

include('Axioms/CSR002+5.ax')

mtvisible(c_tptpgeo_member7_mt) \Rightarrow geographicalsubregions(c_georegion_l2_x5_y8, c_georegion_l4_x45_y72) fof(query₂₈₇,

CSR038+2.p Autogenerated Cyc Problem CSR038+2

include('Axioms/CSR002+1.ax')

$\exists x$: (mtvisible(c_knowledgefragmentd3mt) \Rightarrow (tptp_8₉₆₈(x, c_tptpnsubcollectionofwithrelationTOTYPEFNISSUINGAPRESCRIPTIONPR

CSR038+3.p Autogenerated Cyc Problem CSR038+3

include('Axioms/CSR002+2.ax')

$\exists x$: (mtvisible(c_knowledgefragmentd3mt) \Rightarrow (tptp_8₉₆₈(x, c_tptpnsubcollectionofwithrelationTOTYPEFNISSUINGAPRESCRIPTIONPR

CSR038+4.p Autogenerated Cyc Problem CSR038+4

include('Axioms/CSR002+3.ax')

$\exists x$: (mtvisible(c_knowledgefragmentd3mt) \Rightarrow (tptp_8₉₆₈(x, c_tptpnsubcollectionofwithrelationTOTYPEFNISSUINGAPRESCRIPTIONPR

CSR038+5.p Autogenerated Cyc Problem CSR038+5

include('Axioms/CSR002+4.ax')

$\exists x$: (mtvisible(c_knowledgefragmentd3mt) \Rightarrow (tptp_8₉₆₈(x, c_tptpnsubcollectionofwithrelationTOTYPEFNISSUINGAPRESCRIPTIONPR

CSR038+6.p Autogenerated Cyc Problem CSR038+6

include('Axioms/CSR002+5.ax')

$\exists x$: (mtvisible(c_knowledgefragmentd3mt) \Rightarrow (tptp_8₉₆₈(x, c_tptpnsubcollectionofwithrelationTOTYPEFNISSUINGAPRESCRIPTIONPR

CSR039+2.p Autogenerated Cyc Problem CSR039+2

include('Axioms/CSR002+1.ax')

mtvisible(f_contentmtofcdafromeventfn(f_urlreferentfn(f_urlfn(s_http_wwwpoweripodsearchinfobrown_ipodhtml)), c_translation
disjointwith(c_tptpcol_15₉₃₇₇₅, c_tptpcol_13₁₈₆₆₄) fof(query₈₉, conjecture)

CSR039+3.p Autogenerated Cyc Problem CSR039+3

include('Axioms/CSR002+2.ax')

mtvisible(f_contentmtofcdafromeventfn(f_urlreferentfn(f_urlfn(s_http_wwwpoweripodsearchinfobrown_ipodhtml)), c_translation
disjointwith(c_tptpcol_15₉₃₇₇₅, c_tptpcol_13₁₈₆₆₄) fof(query₁₃₉, conjecture)

CSR039+4.p Autogenerated Cyc Problem CSR039+4

include('Axioms/CSR002+3.ax')

mtvisible(f_contentmtofcdafromeventfn(f_urlreferentfn(f_urlfn(s_http_wwwpoweripodsearchinfobrown_ipodhtml)), c_translation
disjointwith(c_tptpcol_15₉₃₇₇₅, c_tptpcol_13₁₈₆₆₄) fof(query₁₈₉, conjecture)

CSR039+5.p Autogenerated Cyc Problem CSR039+5

include('Axioms/CSR002+4.ax')

mtvisible(f_contentmtofcdafromeventfn(f_urlreferentfn(f_urlfn(s_http_wwwpoweripodsearchinfobrown_ipodhtml)), c_translation
disjointwith(c_tptpcol_15₉₃₇₇₅, c_tptpcol_13₁₈₆₆₄) fof(query₂₃₉, conjecture)

CSR039+6.p Autogenerated Cyc Problem CSR039+6

include('Axioms/CSR002+5.ax')

mtvisible(f_contentmtofcdafromeventfn(f_urlreferentfn(f_urlfn(s_http_wwwpoweripodsearchinfobrown_ipodhtml)), c_translation
disjointwith(c_tptpcol_15₉₃₇₇₅, c_tptpcol_13₁₈₆₆₄) fof(query₂₈₉, conjecture)

CSR040+2.p Autogenerated Cyc Problem CSR040+2

include('Axioms/CSR002+1.ax')

mtvisible(f_contentmtofcdafromeventfn(f_urlreferentfn(f_urlfn(s_http_wwwthedailybulletincompostcardsmar9chtm)), c_transla
- tptpcol_15₁₀₉₁₈₅(c_tptpcol_16₆₂₁₈₇) fof(query₉₀, conjecture)

CSR040+3.p Autogenerated Cyc Problem CSR040+3

include('Axioms/CSR002+2.ax')

mtvisible(f_contentmtofcdafromeventfn(f_urlreferentfn(f_urlfn(s_http_wwwthedailybulletincompostcardsmar9chtm)), c_transla
- tptpcol_15₁₀₉₁₈₅(c_tptpcol_16₆₂₁₈₇) fof(query₁₄₀, conjecture)

CSR040+4.p Autogenerated Cyc Problem CSR040+4

include('Axioms/CSR002+3.ax')

mtvisible(f_contentmtofcdafromeventfn(f_urlreferentfn(f_urlfn(s_http_wwwthedailybulletincompostcardsmar9chtm)), c_transla
- tptpcol_15₁₀₉₁₈₅(c_tptpcol_16₆₂₁₈₇) fof(query₁₉₀, conjecture)

CSR040+5.p Autogenerated Cyc Problem CSR040+5

include('Axioms/CSR002+4.ax')

$\text{mtvisible}(f_content\text{mtofcdafromeventfn}(f_urlreferentfn(f_urlfn(s_http_www\text{thedailybulletincompostcardsmar9chtm}))), c_transla$
 $\neg \text{tptpcol}_{15_{109185}}(c_tptpcol_{16_{62187}}) \quad \text{fof}(\text{query}_{240}, \text{conjecture})$

CSR040+6.p Autogenerated Cyc Problem CSR040+6
 $\text{include}('Axioms/CSR002+5.ax')$
 $\text{mtvisible}(f_content\text{mtofcdafromeventfn}(f_urlreferentfn(f_urlfn(s_http_www\text{thedailybulletincompostcardsmar9chtm}))), c_transla$
 $\neg \text{tptpcol}_{15_{109185}}(c_tptpcol_{16_{62187}}) \quad \text{fof}(\text{query}_{290}, \text{conjecture})$

CSR041+2.p Autogenerated Cyc Problem CSR041+2
 $\text{include}('Axioms/CSR002+1.ax')$
 $\text{mtvisible}(c_tptp_member2831_mt) \Rightarrow \text{aspatialthing}(f_content\text{mtofcdafromeventfn}(f_urlreferentfn(f_urlfn(s_http_www\text{informat}$

CSR041+3.p Autogenerated Cyc Problem CSR041+3
 $\text{include}('Axioms/CSR002+2.ax')$
 $\text{mtvisible}(c_tptp_member2831_mt) \Rightarrow \text{aspatialthing}(f_content\text{mtofcdafromeventfn}(f_urlreferentfn(f_urlfn(s_http_www\text{informat}$

CSR041+4.p Autogenerated Cyc Problem CSR041+4
 $\text{include}('Axioms/CSR002+3.ax')$
 $\text{mtvisible}(c_tptp_member2831_mt) \Rightarrow \text{aspatialthing}(f_content\text{mtofcdafromeventfn}(f_urlreferentfn(f_urlfn(s_http_www\text{informat}$

CSR041+5.p Autogenerated Cyc Problem CSR041+5
 $\text{include}('Axioms/CSR002+4.ax')$
 $\text{mtvisible}(c_tptp_member2831_mt) \Rightarrow \text{aspatialthing}(f_content\text{mtofcdafromeventfn}(f_urlreferentfn(f_urlfn(s_http_www\text{informat}$

CSR041+6.p Autogenerated Cyc Problem CSR041+6
 $\text{include}('Axioms/CSR002+5.ax')$
 $\text{mtvisible}(c_tptp_member2831_mt) \Rightarrow \text{aspatialthing}(f_content\text{mtofcdafromeventfn}(f_urlreferentfn(f_urlfn(s_http_www\text{informat}$

CSR042+2.p Autogenerated Cyc Problem CSR042+2
 $\text{include}('Axioms/CSR002+1.ax')$
 $\exists aRG_1: (\text{mtvisible}(c_tptpgeo_member7_mt) \Rightarrow \text{borderson}(aRG_1, c_georegion_{14_x27_y64})) \quad \text{fof}(\text{query}_{92}, \text{conjecture})$

CSR042+3.p Autogenerated Cyc Problem CSR042+3
 $\text{include}('Axioms/CSR002+2.ax')$
 $\exists aRG_1: (\text{mtvisible}(c_tptpgeo_member7_mt) \Rightarrow \text{borderson}(aRG_1, c_georegion_{14_x27_y64})) \quad \text{fof}(\text{query}_{142}, \text{conjecture})$

CSR042+4.p Autogenerated Cyc Problem CSR042+4
 $\text{include}('Axioms/CSR002+3.ax')$
 $\exists aRG_1: (\text{mtvisible}(c_tptpgeo_member7_mt) \Rightarrow \text{borderson}(aRG_1, c_georegion_{14_x27_y64})) \quad \text{fof}(\text{query}_{192}, \text{conjecture})$

CSR042+5.p Autogenerated Cyc Problem CSR042+5
 $\text{include}('Axioms/CSR002+4.ax')$
 $\exists aRG_1: (\text{mtvisible}(c_tptpgeo_member7_mt) \Rightarrow \text{borderson}(aRG_1, c_georegion_{14_x27_y64})) \quad \text{fof}(\text{query}_{242}, \text{conjecture})$

CSR042+6.p Autogenerated Cyc Problem CSR042+6
 $\text{include}('Axioms/CSR002+5.ax')$
 $\exists aRG_1: (\text{mtvisible}(c_tptpgeo_member7_mt) \Rightarrow \text{borderson}(aRG_1, c_georegion_{14_x27_y64})) \quad \text{fof}(\text{query}_{292}, \text{conjecture})$

CSR043+2.p Autogenerated Cyc Problem CSR043+2
 $\text{include}('Axioms/CSR002+1.ax')$
 $\text{mtvisible}(c_tptp_member2862_mt) \Rightarrow \text{genls}(c_tptpcol_{16_{30972}}, c_tptpcol_{15_{30970}}) \quad \text{fof}(\text{query}_{93}, \text{conjecture})$

CSR043+3.p Autogenerated Cyc Problem CSR043+3
 $\text{include}('Axioms/CSR002+2.ax')$
 $\text{mtvisible}(c_tptp_member2862_mt) \Rightarrow \text{genls}(c_tptpcol_{16_{30972}}, c_tptpcol_{15_{30970}}) \quad \text{fof}(\text{query}_{143}, \text{conjecture})$

CSR043+4.p Autogenerated Cyc Problem CSR043+4
 $\text{include}('Axioms/CSR002+3.ax')$
 $\text{mtvisible}(c_tptp_member2862_mt) \Rightarrow \text{genls}(c_tptpcol_{16_{30972}}, c_tptpcol_{15_{30970}}) \quad \text{fof}(\text{query}_{193}, \text{conjecture})$

CSR043+5.p Autogenerated Cyc Problem CSR043+5
 $\text{include}('Axioms/CSR002+4.ax')$
 $\text{mtvisible}(c_tptp_member2862_mt) \Rightarrow \text{genls}(c_tptpcol_{16_{30972}}, c_tptpcol_{15_{30970}}) \quad \text{fof}(\text{query}_{243}, \text{conjecture})$

CSR043+6.p Autogenerated Cyc Problem CSR043+6
 $\text{include}('Axioms/CSR002+5.ax')$
 $\text{mtvisible}(c_tptp_member2862_mt) \Rightarrow \text{genls}(c_tptpcol_{16_{30972}}, c_tptpcol_{15_{30970}}) \quad \text{fof}(\text{query}_{293}, \text{conjecture})$

CSR044+2.p Autogenerated Cyc Problem CSR044+2
 $\text{include}('Axioms/CSR002+1.ax')$

$\exists x: (\text{mtvisible}(c_tptp_member3633_mt) \Rightarrow (\text{tptp_9}_{720}(c_tptpexecutionbyfiringsquad_{90}, x) \text{ and } \text{tptpcol_16}_{29490}(x)))$ fof(que

CSR044+3.p Autogenerated Cyc Problem CSR044+3
 include('Axioms/CSR002+2.ax')
 $\exists x: (\text{mtvisible}(c_tptp_member3633_mt) \Rightarrow (\text{tptp_9}_{720}(c_tptpexecutionbyfiringsquad_{90}, x) \text{ and } \text{tptpcol_16}_{29490}(x)))$ fof(que

CSR044+4.p Autogenerated Cyc Problem CSR044+4
 include('Axioms/CSR002+3.ax')
 $\exists x: (\text{mtvisible}(c_tptp_member3633_mt) \Rightarrow (\text{tptp_9}_{720}(c_tptpexecutionbyfiringsquad_{90}, x) \text{ and } \text{tptpcol_16}_{29490}(x)))$ fof(que

CSR044+5.p Autogenerated Cyc Problem CSR044+5
 include('Axioms/CSR002+4.ax')
 $\exists x: (\text{mtvisible}(c_tptp_member3633_mt) \Rightarrow (\text{tptp_9}_{720}(c_tptpexecutionbyfiringsquad_{90}, x) \text{ and } \text{tptpcol_16}_{29490}(x)))$ fof(que

CSR044+6.p Autogenerated Cyc Problem CSR044+6
 include('Axioms/CSR002+5.ax')
 $\exists x: (\text{mtvisible}(c_tptp_member3633_mt) \Rightarrow (\text{tptp_9}_{720}(c_tptpexecutionbyfiringsquad_{90}, x) \text{ and } \text{tptpcol_16}_{29490}(x)))$ fof(que

CSR045+2.p Autogenerated Cyc Problem CSR045+2
 include('Axioms/CSR002+1.ax')
 $\neg \text{gens}(c_wamt_evalinitial_p_{14}, c_tptpcol_15_{80088})$ fof(query₉₅, conjecture)

CSR045+3.p Autogenerated Cyc Problem CSR045+3
 include('Axioms/CSR002+2.ax')
 $\neg \text{gens}(c_wamt_evalinitial_p_{14}, c_tptpcol_15_{80088})$ fof(query₁₄₅, conjecture)

CSR045+4.p Autogenerated Cyc Problem CSR045+4
 include('Axioms/CSR002+3.ax')
 $\neg \text{gens}(c_wamt_evalinitial_p_{14}, c_tptpcol_15_{80088})$ fof(query₁₉₅, conjecture)

CSR045+5.p Autogenerated Cyc Problem CSR045+5
 include('Axioms/CSR002+4.ax')
 $\neg \text{gens}(c_wamt_evalinitial_p_{14}, c_tptpcol_15_{80088})$ fof(query₂₄₅, conjecture)

CSR045+6.p Autogenerated Cyc Problem CSR045+6
 include('Axioms/CSR002+5.ax')
 $\neg \text{gens}(c_wamt_evalinitial_p_{14}, c_tptpcol_15_{80088})$ fof(query₂₉₅, conjecture)

CSR046+2.p Autogenerated Cyc Problem CSR046+2
 include('Axioms/CSR002+1.ax')
 $\text{mtvisible}(f_contentmtofcdafromeventfn(f_urlreferentfn(f_urlfn(s_http_wwwfuntriviacomplayquizcfmqid60926origin))), c_transla$
 $\text{gens}(c_tptpcol_16_{50958}, c_tptpcol_15_{50957})$ fof(query₉₆, conjecture)

CSR046+3.p Autogenerated Cyc Problem CSR046+3
 include('Axioms/CSR002+2.ax')
 $\text{mtvisible}(f_contentmtofcdafromeventfn(f_urlreferentfn(f_urlfn(s_http_wwwfuntriviacomplayquizcfmqid60926origin))), c_transla$
 $\text{gens}(c_tptpcol_16_{50958}, c_tptpcol_15_{50957})$ fof(query₁₄₆, conjecture)

CSR046+4.p Autogenerated Cyc Problem CSR046+4
 include('Axioms/CSR002+3.ax')
 $\text{mtvisible}(f_contentmtofcdafromeventfn(f_urlreferentfn(f_urlfn(s_http_wwwfuntriviacomplayquizcfmqid60926origin))), c_transla$
 $\text{gens}(c_tptpcol_16_{50958}, c_tptpcol_15_{50957})$ fof(query₁₉₆, conjecture)

CSR046+5.p Autogenerated Cyc Problem CSR046+5
 include('Axioms/CSR002+4.ax')
 $\text{mtvisible}(f_contentmtofcdafromeventfn(f_urlreferentfn(f_urlfn(s_http_wwwfuntriviacomplayquizcfmqid60926origin))), c_transla$
 $\text{gens}(c_tptpcol_16_{50958}, c_tptpcol_15_{50957})$ fof(query₂₄₆, conjecture)

CSR046+6.p Autogenerated Cyc Problem CSR046+6
 include('Axioms/CSR002+5.ax')
 $\text{mtvisible}(f_contentmtofcdafromeventfn(f_urlreferentfn(f_urlfn(s_http_wwwfuntriviacomplayquizcfmqid60926origin))), c_transla$
 $\text{gens}(c_tptpcol_16_{50958}, c_tptpcol_15_{50957})$ fof(query₂₉₆, conjecture)

CSR047+2.p Autogenerated Cyc Problem CSR047+2
 include('Axioms/CSR002+1.ax')
 $\text{mtvisible}(c_tptpgeo_member4_mt) \Rightarrow \text{borderson}(c_georegion_l4_x37_y_{50}, c_georegion_l4_x36_y_{50})$ fof(query₉₇, conjecture)

CSR047+3.p Autogenerated Cyc Problem CSR047+3
 include('Axioms/CSR002+2.ax')

$\text{mtvisible}(c_tptpgeo_member4_mt) \Rightarrow \text{borderson}(c_georegion_l4_x37_y50, c_georegion_l4_x36_y50)$ $\text{fof}(\text{query}_{147}, \text{conjecture})$
CSR047+4.p Autogenerated Cyc Problem CSR047+4
 $\text{include}('Axioms/CSR002+3.ax')$
 $\text{mtvisible}(c_tptpgeo_member4_mt) \Rightarrow \text{borderson}(c_georegion_l4_x37_y50, c_georegion_l4_x36_y50)$ $\text{fof}(\text{query}_{197}, \text{conjecture})$
CSR047+5.p Autogenerated Cyc Problem CSR047+5
 $\text{include}('Axioms/CSR002+4.ax')$
 $\text{mtvisible}(c_tptpgeo_member4_mt) \Rightarrow \text{borderson}(c_georegion_l4_x37_y50, c_georegion_l4_x36_y50)$ $\text{fof}(\text{query}_{247}, \text{conjecture})$
CSR047+6.p Autogenerated Cyc Problem CSR047+6
 $\text{include}('Axioms/CSR002+5.ax')$
 $\text{mtvisible}(c_tptpgeo_member4_mt) \Rightarrow \text{borderson}(c_georegion_l4_x37_y50, c_georegion_l4_x36_y50)$ $\text{fof}(\text{query}_{297}, \text{conjecture})$
CSR048+2.p Autogenerated Cyc Problem CSR048+2
 $\text{include}('Axioms/CSR002+1.ax')$
 $\exists aRG_2: (\text{mtvisible}(c_tptpgeo_spindlectormt) \Rightarrow \text{borderson}(c_georegion_l4_x45_y9, aRG_2))$ $\text{fof}(\text{query}_{98}, \text{conjecture})$
CSR048+3.p Autogenerated Cyc Problem CSR048+3
 $\text{include}('Axioms/CSR002+2.ax')$
 $\exists aRG_2: (\text{mtvisible}(c_tptpgeo_spindlectormt) \Rightarrow \text{borderson}(c_georegion_l4_x45_y9, aRG_2))$ $\text{fof}(\text{query}_{148}, \text{conjecture})$
CSR048+4.p Autogenerated Cyc Problem CSR048+4
 $\text{include}('Axioms/CSR002+3.ax')$
 $\exists aRG_2: (\text{mtvisible}(c_tptpgeo_spindlectormt) \Rightarrow \text{borderson}(c_georegion_l4_x45_y9, aRG_2))$ $\text{fof}(\text{query}_{198}, \text{conjecture})$
CSR048+5.p Autogenerated Cyc Problem CSR048+5
 $\text{include}('Axioms/CSR002+4.ax')$
 $\exists aRG_2: (\text{mtvisible}(c_tptpgeo_spindlectormt) \Rightarrow \text{borderson}(c_georegion_l4_x45_y9, aRG_2))$ $\text{fof}(\text{query}_{248}, \text{conjecture})$
CSR048+6.p Autogenerated Cyc Problem CSR048+6
 $\text{include}('Axioms/CSR002+5.ax')$
 $\exists aRG_2: (\text{mtvisible}(c_tptpgeo_spindlectormt) \Rightarrow \text{borderson}(c_georegion_l4_x45_y9, aRG_2))$ $\text{fof}(\text{query}_{298}, \text{conjecture})$
CSR049+2.p Autogenerated Cyc Problem CSR049+2
 $\text{include}('Axioms/CSR002+1.ax')$
 $\text{mtvisible}(c_unitedstatesgeographypeoplemt) \Rightarrow \text{disjointwith}(c_tptpcol_16_{26926}, c_tptpcol_16_{92269})$ $\text{fof}(\text{query}_{99}, \text{conjecture})$
CSR049+3.p Autogenerated Cyc Problem CSR049+3
 $\text{include}('Axioms/CSR002+2.ax')$
 $\text{mtvisible}(c_unitedstatesgeographypeoplemt) \Rightarrow \text{disjointwith}(c_tptpcol_16_{26926}, c_tptpcol_16_{92269})$ $\text{fof}(\text{query}_{149}, \text{conjecture})$
CSR049+4.p Autogenerated Cyc Problem CSR049+4
 $\text{include}('Axioms/CSR002+3.ax')$
 $\text{mtvisible}(c_unitedstatesgeographypeoplemt) \Rightarrow \text{disjointwith}(c_tptpcol_16_{26926}, c_tptpcol_16_{92269})$ $\text{fof}(\text{query}_{199}, \text{conjecture})$
CSR049+5.p Autogenerated Cyc Problem CSR049+5
 $\text{include}('Axioms/CSR002+4.ax')$
 $\text{mtvisible}(c_unitedstatesgeographypeoplemt) \Rightarrow \text{disjointwith}(c_tptpcol_16_{26926}, c_tptpcol_16_{92269})$ $\text{fof}(\text{query}_{249}, \text{conjecture})$
CSR049+6.p Autogenerated Cyc Problem CSR049+6
 $\text{include}('Axioms/CSR002+5.ax')$
 $\text{mtvisible}(c_unitedstatesgeographypeoplemt) \Rightarrow \text{disjointwith}(c_tptpcol_16_{26926}, c_tptpcol_16_{92269})$ $\text{fof}(\text{query}_{299}, \text{conjecture})$
CSR050+2.p Autogenerated Cyc Problem CSR050+2
 $\text{include}('Axioms/CSR002+1.ax')$
 $\text{mtvisible}(f_contentmtofcdafromeventfn(f_urlreferentfn(f_urlfn(s_http_memberstripodcomindygalfordtriviahtm)), c_translation, tptptypes_7_{691}(c_tptpcol_16_{26939}, f_subcollectionofwithrelationtofn(c_ship, c_objectfoundinlocation, c_cityofbostonma)))$ $\text{fof}(\text{query}_{349}, \text{conjecture})$
CSR050+3.p Autogenerated Cyc Problem CSR050+3
 $\text{include}('Axioms/CSR002+2.ax')$
 $\text{mtvisible}(f_contentmtofcdafromeventfn(f_urlreferentfn(f_urlfn(s_http_memberstripodcomindygalfordtriviahtm)), c_translation, tptptypes_7_{691}(c_tptpcol_16_{26939}, f_subcollectionofwithrelationtofn(c_ship, c_objectfoundinlocation, c_cityofbostonma)))$ $\text{fof}(\text{query}_{399}, \text{conjecture})$
CSR050+4.p Autogenerated Cyc Problem CSR050+4
 $\text{include}('Axioms/CSR002+3.ax')$
 $\text{mtvisible}(f_contentmtofcdafromeventfn(f_urlreferentfn(f_urlfn(s_http_memberstripodcomindygalfordtriviahtm)), c_translation, tptptypes_7_{691}(c_tptpcol_16_{26939}, f_subcollectionofwithrelationtofn(c_ship, c_objectfoundinlocation, c_cityofbostonma)))$ $\text{fof}(\text{query}_{449}, \text{conjecture})$
CSR050+5.p Autogenerated Cyc Problem CSR050+5

include('Axioms/CSR002+4.ax')

mtvisible(f_contentmtofcdafromeventfn(f_urlreferentfn(f_urlfn(s_http_memberstripodcomindygalfordtriviahtm)), c_translation, tptptypes_7691(c_tptpcol_1626939, f_subcollectionofwithrelationtofn(c_ship, c_objectfoundinlocation, c_cityofbostonma)) fof

CSR050+6.p Autogenerated Cyc Problem CSR050+6

include('Axioms/CSR002+5.ax')

mtvisible(f_contentmtofcdafromeventfn(f_urlreferentfn(f_urlfn(s_http_memberstripodcomindygalfordtriviahtm)), c_translation, tptptypes_7691(c_tptpcol_1626939, f_subcollectionofwithrelationtofn(c_ship, c_objectfoundinlocation, c_cityofbostonma)) fof

CSR051+2.p Autogenerated Cyc Problem CSR051+2

include('Axioms/CSR002+1.ax')

$\exists x: (\text{mtvisible}(\text{c_tptp_member3356_mt}) \Rightarrow \text{marriagelicensedocument}(x)) \quad \text{fof}(\text{query}_{101}, \text{conjecture})$

CSR051+3.p Autogenerated Cyc Problem CSR051+3

include('Axioms/CSR002+2.ax')

$\exists x: (\text{mtvisible}(\text{c_tptp_member3356_mt}) \Rightarrow \text{marriagelicensedocument}(x)) \quad \text{fof}(\text{query}_{151}, \text{conjecture})$

CSR051+4.p Autogenerated Cyc Problem CSR051+4

include('Axioms/CSR002+3.ax')

$\exists x: (\text{mtvisible}(\text{c_tptp_member3356_mt}) \Rightarrow \text{marriagelicensedocument}(x)) \quad \text{fof}(\text{query}_{201}, \text{conjecture})$

CSR051+5.p Autogenerated Cyc Problem CSR051+5

include('Axioms/CSR002+4.ax')

$\exists x: (\text{mtvisible}(\text{c_tptp_member3356_mt}) \Rightarrow \text{marriagelicensedocument}(x)) \quad \text{fof}(\text{query}_{251}, \text{conjecture})$

CSR051+6.p Autogenerated Cyc Problem CSR051+6

include('Axioms/CSR002+5.ax')

$\exists x: (\text{mtvisible}(\text{c_tptp_member3356_mt}) \Rightarrow \text{marriagelicensedocument}(x)) \quad \text{fof}(\text{query}_{301}, \text{conjecture})$

CSR052+2.p Autogenerated Cyc Problem CSR052+2

include('Axioms/CSR002+1.ax')

mtvisible(f_contentmtofcdafromeventfn(f_urlreferentfn(f_urlfn(s_http_ukencartamsncomencyclopedia_761573010_4united_state_gens(c_tptpcol_1540430, c_tptpcol_739939)) fof(query₁₀₂, conjecture)

CSR052+3.p Autogenerated Cyc Problem CSR052+3

include('Axioms/CSR002+2.ax')

mtvisible(f_contentmtofcdafromeventfn(f_urlreferentfn(f_urlfn(s_http_ukencartamsncomencyclopedia_761573010_4united_state_gens(c_tptpcol_1540430, c_tptpcol_739939)) fof(query₁₅₂, conjecture)

CSR052+4.p Autogenerated Cyc Problem CSR052+4

include('Axioms/CSR002+3.ax')

mtvisible(f_contentmtofcdafromeventfn(f_urlreferentfn(f_urlfn(s_http_ukencartamsncomencyclopedia_761573010_4united_state_gens(c_tptpcol_1540430, c_tptpcol_739939)) fof(query₂₀₂, conjecture)

CSR052+5.p Autogenerated Cyc Problem CSR052+5

include('Axioms/CSR002+4.ax')

mtvisible(f_contentmtofcdafromeventfn(f_urlreferentfn(f_urlfn(s_http_ukencartamsncomencyclopedia_761573010_4united_state_gens(c_tptpcol_1540430, c_tptpcol_739939)) fof(query₂₅₂, conjecture)

CSR052+6.p Autogenerated Cyc Problem CSR052+6

include('Axioms/CSR002+5.ax')

mtvisible(f_contentmtofcdafromeventfn(f_urlreferentfn(f_urlfn(s_http_ukencartamsncomencyclopedia_761573010_4united_state_gens(c_tptpcol_1540430, c_tptpcol_739939)) fof(query₃₀₂, conjecture)

CSR053+2.p Autogenerated Cyc Problem CSR053+2

include('Axioms/CSR002+1.ax')

mtvisible(c_tptpgeo_member1_mt) \Rightarrow geographicalsubregions(c_georegion_l3_x11_y2, c_georegion_l4_x35_y7) fof(query₁₀₃,

CSR053+3.p Autogenerated Cyc Problem CSR053+3

include('Axioms/CSR002+2.ax')

mtvisible(c_tptpgeo_member1_mt) \Rightarrow geographicalsubregions(c_georegion_l3_x11_y2, c_georegion_l4_x35_y7) fof(query₁₅₃,

CSR053+4.p Autogenerated Cyc Problem CSR053+4

include('Axioms/CSR002+3.ax')

mtvisible(c_tptpgeo_member1_mt) \Rightarrow geographicalsubregions(c_georegion_l3_x11_y2, c_georegion_l4_x35_y7) fof(query₂₀₃,

CSR053+5.p Autogenerated Cyc Problem CSR053+5

include('Axioms/CSR002+4.ax')

mtvisible(c_tptpgeo_member1_mt) \Rightarrow geographicalsubregions(c_georegion_l3_x11_y2, c_georegion_l4_x35_y7) fof(query₂₅₃,

CSR053+6.p Autogenerated Cyc Problem CSR053+6

include('Axioms/CSR002+5.ax')

mtvisible(c.tptpgeo_member1_mt) \Rightarrow geographicalsubregions(c.georegion_l3_x11_y2, c.georegion_l4_x35_y7) fof(query₃₀₃,

CSR054+2.p Autogenerated Cyc Problem CSR054+2

include('Axioms/CSR002+1.ax')

$\exists x$: (mtvisible(c.currentworlddatacollectormt_nonhomocentric) \Rightarrow tptpofobject(f_instancewithrelationtofn(c.airport_physical

CSR054+3.p Autogenerated Cyc Problem CSR054+3

include('Axioms/CSR002+2.ax')

$\exists x$: (mtvisible(c.currentworlddatacollectormt_nonhomocentric) \Rightarrow tptpofobject(f_instancewithrelationtofn(c.airport_physical

CSR054+4.p Autogenerated Cyc Problem CSR054+4

include('Axioms/CSR002+3.ax')

$\exists x$: (mtvisible(c.currentworlddatacollectormt_nonhomocentric) \Rightarrow tptpofobject(f_instancewithrelationtofn(c.airport_physical

CSR054+5.p Autogenerated Cyc Problem CSR054+5

include('Axioms/CSR002+4.ax')

$\exists x$: (mtvisible(c.currentworlddatacollectormt_nonhomocentric) \Rightarrow tptpofobject(f_instancewithrelationtofn(c.airport_physical

CSR054+6.p Autogenerated Cyc Problem CSR054+6

include('Axioms/CSR002+5.ax')

$\exists x$: (mtvisible(c.currentworlddatacollectormt_nonhomocentric) \Rightarrow tptpofobject(f_instancewithrelationtofn(c.airport_physical

CSR055+2.p Autogenerated Cyc Problem CSR055+2

include('Axioms/CSR002+1.ax')

\neg disjointwith(c.xskijump.thegame, c.tptpcol_16₃₅₃₀₁) fof(query₁₀₅, conjecture)

CSR055+3.p Autogenerated Cyc Problem CSR055+3

include('Axioms/CSR002+2.ax')

\neg disjointwith(c.xskijump.thegame, c.tptpcol_16₃₅₃₀₁) fof(query₁₅₅, conjecture)

CSR055+4.p Autogenerated Cyc Problem CSR055+4

include('Axioms/CSR002+3.ax')

\neg disjointwith(c.xskijump.thegame, c.tptpcol_16₃₅₃₀₁) fof(query₂₀₅, conjecture)

CSR055+5.p Autogenerated Cyc Problem CSR055+5

include('Axioms/CSR002+4.ax')

\neg disjointwith(c.xskijump.thegame, c.tptpcol_16₃₅₃₀₁) fof(query₂₅₅, conjecture)

CSR055+6.p Autogenerated Cyc Problem CSR055+6

include('Axioms/CSR002+5.ax')

\neg disjointwith(c.xskijump.thegame, c.tptpcol_16₃₅₃₀₁) fof(query₃₀₅, conjecture)

CSR056+2.p Autogenerated Cyc Problem CSR056+2

include('Axioms/CSR002+1.ax')

\exists q_{QUANTITY}: (mtvisible(c.tptp_member3717_mt) \Rightarrow tptpofobject(c.tptpartsupplies, q_{QUANTITY})) fof(query₁₀₆, conjecture)

CSR056+3.p Autogenerated Cyc Problem CSR056+3

include('Axioms/CSR002+2.ax')

\exists q_{QUANTITY}: (mtvisible(c.tptp_member3717_mt) \Rightarrow tptpofobject(c.tptpartsupplies, q_{QUANTITY})) fof(query₁₅₆, conjecture)

CSR056+4.p Autogenerated Cyc Problem CSR056+4

include('Axioms/CSR002+3.ax')

\exists q_{QUANTITY}: (mtvisible(c.tptp_member3717_mt) \Rightarrow tptpofobject(c.tptpartsupplies, q_{QUANTITY})) fof(query₂₀₆, conjecture)

CSR056+5.p Autogenerated Cyc Problem CSR056+5

include('Axioms/CSR002+4.ax')

\exists q_{QUANTITY}: (mtvisible(c.tptp_member3717_mt) \Rightarrow tptpofobject(c.tptpartsupplies, q_{QUANTITY})) fof(query₂₅₆, conjecture)

CSR056+6.p Autogenerated Cyc Problem CSR056+6

include('Axioms/CSR002+5.ax')

\exists q_{QUANTITY}: (mtvisible(c.tptp_member3717_mt) \Rightarrow tptpofobject(c.tptpartsupplies, q_{QUANTITY})) fof(query₃₀₆, conjecture)

CSR057+2.p Autogenerated Cyc Problem CSR057+2

include('Axioms/CSR002+1.ax')

$\exists x$: (mtvisible(c.tptpgeo_member8_mt) \Rightarrow inregion(x, c.georegion_l4_x75_y75)) fof(query₁₀₇, conjecture)

CSR057+3.p Autogenerated Cyc Problem CSR057+3

include('Axioms/CSR002+2.ax')

$\exists x: (\text{mtvisible}(c_tptpgeo_member8_mt) \Rightarrow \text{inregion}(x, c_georegion_l4_x75_y75))$ fof(query₁₅₇, conjecture)

CSR057+4.p Autogenerated Cyc Problem CSR057+4

include('Axioms/CSR002+3.ax')

$\exists x: (\text{mtvisible}(c_tptpgeo_member8_mt) \Rightarrow \text{inregion}(x, c_georegion_l4_x75_y75))$ fof(query₂₀₇, conjecture)

CSR057+5.p Autogenerated Cyc Problem CSR057+5

include('Axioms/CSR002+4.ax')

$\exists x: (\text{mtvisible}(c_tptpgeo_member8_mt) \Rightarrow \text{inregion}(x, c_georegion_l4_x75_y75))$ fof(query₂₅₇, conjecture)

CSR057+6.p Autogenerated Cyc Problem CSR057+6

include('Axioms/CSR002+5.ax')

$\exists x: (\text{mtvisible}(c_tptpgeo_member8_mt) \Rightarrow \text{inregion}(x, c_georegion_l4_x75_y75))$ fof(query₃₀₇, conjecture)

CSR058+2.p Autogenerated Cyc Problem CSR058+2

include('Axioms/CSR002+1.ax')

$\exists x: (\text{mtvisible}(c_englishmt) \Rightarrow \text{prettystring}(f_subcollectionofwithrelationfromtypefn(c_terrorist, c_hasmembers, c_terroristgro$

CSR058+3.p Autogenerated Cyc Problem CSR058+3

include('Axioms/CSR002+2.ax')

$\exists x: (\text{mtvisible}(c_englishmt) \Rightarrow \text{prettystring}(f_subcollectionofwithrelationfromtypefn(c_terrorist, c_hasmembers, c_terroristgro$

CSR058+4.p Autogenerated Cyc Problem CSR058+4

include('Axioms/CSR002+3.ax')

$\exists x: (\text{mtvisible}(c_englishmt) \Rightarrow \text{prettystring}(f_subcollectionofwithrelationfromtypefn(c_terrorist, c_hasmembers, c_terroristgro$

CSR058+5.p Autogenerated Cyc Problem CSR058+5

include('Axioms/CSR002+4.ax')

$\exists x: (\text{mtvisible}(c_englishmt) \Rightarrow \text{prettystring}(f_subcollectionofwithrelationfromtypefn(c_terrorist, c_hasmembers, c_terroristgro$

CSR058+6.p Autogenerated Cyc Problem CSR058+6

include('Axioms/CSR002+5.ax')

$\exists x: (\text{mtvisible}(c_englishmt) \Rightarrow \text{prettystring}(f_subcollectionofwithrelationfromtypefn(c_terrorist, c_hasmembers, c_terroristgro$

CSR059+2.p Autogenerated Cyc Problem CSR059+2

include('Axioms/CSR002+1.ax')

$\text{mtvisible}(c_tptpgeo_spindlecollectormt) \Rightarrow \text{borderson}(c_georegion_l4_x57_y47, c_georegion_l4_x56_y47)$ fof(query₁₀₉, conje

CSR059+3.p Autogenerated Cyc Problem CSR059+3

include('Axioms/CSR002+2.ax')

$\text{mtvisible}(c_tptpgeo_spindlecollectormt) \Rightarrow \text{borderson}(c_georegion_l4_x57_y47, c_georegion_l4_x56_y47)$ fof(query₁₅₉, conje

CSR059+4.p Autogenerated Cyc Problem CSR059+4

include('Axioms/CSR002+3.ax')

$\text{mtvisible}(c_tptpgeo_spindlecollectormt) \Rightarrow \text{borderson}(c_georegion_l4_x57_y47, c_georegion_l4_x56_y47)$ fof(query₂₀₉, conje

CSR059+5.p Autogenerated Cyc Problem CSR059+5

include('Axioms/CSR002+4.ax')

$\text{mtvisible}(c_tptpgeo_spindlecollectormt) \Rightarrow \text{borderson}(c_georegion_l4_x57_y47, c_georegion_l4_x56_y47)$ fof(query₂₅₉, conje

CSR059+6.p Autogenerated Cyc Problem CSR059+6

include('Axioms/CSR002+5.ax')

$\text{mtvisible}(c_tptpgeo_spindlecollectormt) \Rightarrow \text{borderson}(c_georegion_l4_x57_y47, c_georegion_l4_x56_y47)$ fof(query₃₀₉, conje

CSR060+2.p Autogenerated Cyc Problem CSR060+2

include('Axioms/CSR002+1.ax')

$\exists x: (\text{mtvisible}(f_contentmtofcdfafromeventfn(f_urlreferentfn(f_urlfn(s_http_wwwsurgerydoorcoukmedconsprintasprecno_{23068988}$
(tptp_9₅₁(x, c_tptpnsbcollectionofwithrelationofnshipobjectfoundinlocationcityofbostonma₈₀₂) and tptpcol_16₂₇₁₈₉(x)))

CSR060+3.p Autogenerated Cyc Problem CSR060+3

include('Axioms/CSR002+2.ax')

$\exists x: (\text{mtvisible}(f_contentmtofcdfafromeventfn(f_urlreferentfn(f_urlfn(s_http_wwwsurgerydoorcoukmedconsprintasprecno_{23068988}$
(tptp_9₅₁(x, c_tptpnsbcollectionofwithrelationofnshipobjectfoundinlocationcityofbostonma₈₀₂) and tptpcol_16₂₇₁₈₉(x)))

CSR060+4.p Autogenerated Cyc Problem CSR060+4

include('Axioms/CSR002+3.ax')

$\exists x: (\text{mtvisible}(f_contentmtofcdfafromeventfn(f_urlreferentfn(f_urlfn(s_http_wwwsurgerydoorcoukmedconsprintasprecno_{23068988}$
(tptp_9₅₁(x, c_tptpnsbcollectionofwithrelationofnshipobjectfoundinlocationcityofbostonma₈₀₂) and tptpcol_16₂₇₁₈₉(x)))

CSR060+5.p Autogenerated Cyc Problem CSR060+5

include('Axioms/CSR002+4.ax')

$\exists x: (\text{mtvisible}(\text{f_contentmtofcdafromeventfn}(\text{f_urlreferentfn}(\text{f_urlfn}(\text{s_http_wwwsurgerydoorcoukmedconsprintasprecno}_{23068988}(\text{tptp_9}_{51}(x, \text{c_tptpnsbcollectionofwithrelationofnshpobjectfoundinlocationcityofbostonma}_{802})) \text{ and } \text{tptpcol_16}_{27189}(x))))$

CSR060+6.p Autogenerated Cyc Problem CSR060+6

include('Axioms/CSR002+5.ax')

$\exists x: (\text{mtvisible}(\text{f_contentmtofcdafromeventfn}(\text{f_urlreferentfn}(\text{f_urlfn}(\text{s_http_wwwsurgerydoorcoukmedconsprintasprecno}_{23068988}(\text{tptp_9}_{51}(x, \text{c_tptpnsbcollectionofwithrelationofnshpobjectfoundinlocationcityofbostonma}_{802})) \text{ and } \text{tptpcol_16}_{27189}(x))))$

CSR061+2.p Autogenerated Cyc Problem CSR061+2

include('Axioms/CSR002+1.ax')

$\text{mtvisible}(\text{c_timehasnoendmt}) \Rightarrow \text{disjointwith}(\text{c_tptpcol_8}_{114177}, \text{c_tptpcol_14}_{118118}) \quad \text{fof}(\text{query}_{111}, \text{conjecture})$

CSR061+3.p Autogenerated Cyc Problem CSR061+3

include('Axioms/CSR002+2.ax')

$\text{mtvisible}(\text{c_timehasnoendmt}) \Rightarrow \text{disjointwith}(\text{c_tptpcol_8}_{114177}, \text{c_tptpcol_14}_{118118}) \quad \text{fof}(\text{query}_{161}, \text{conjecture})$

CSR061+4.p Autogenerated Cyc Problem CSR061+4

include('Axioms/CSR002+3.ax')

$\text{mtvisible}(\text{c_timehasnoendmt}) \Rightarrow \text{disjointwith}(\text{c_tptpcol_8}_{114177}, \text{c_tptpcol_14}_{118118}) \quad \text{fof}(\text{query}_{211}, \text{conjecture})$

CSR061+5.p Autogenerated Cyc Problem CSR061+5

include('Axioms/CSR002+4.ax')

$\text{mtvisible}(\text{c_timehasnoendmt}) \Rightarrow \text{disjointwith}(\text{c_tptpcol_8}_{114177}, \text{c_tptpcol_14}_{118118}) \quad \text{fof}(\text{query}_{261}, \text{conjecture})$

CSR061+6.p Autogenerated Cyc Problem CSR061+6

include('Axioms/CSR002+5.ax')

$\text{mtvisible}(\text{c_timehasnoendmt}) \Rightarrow \text{disjointwith}(\text{c_tptpcol_8}_{114177}, \text{c_tptpcol_14}_{118118}) \quad \text{fof}(\text{query}_{311}, \text{conjecture})$

CSR062+2.p Autogenerated Cyc Problem CSR062+2

include('Axioms/CSR002+1.ax')

$\exists \text{aRG}_1: (\text{mtvisible}(\text{c_tptp_member3205_mt}) \Rightarrow \text{tptptypes_5}_{387}(\text{aRG}_1, \text{c_pushingwithfingers})) \quad \text{fof}(\text{query}_{112}, \text{conjecture})$

CSR062+3.p Autogenerated Cyc Problem CSR062+3

include('Axioms/CSR002+2.ax')

$\exists \text{aRG}_1: (\text{mtvisible}(\text{c_tptp_member3205_mt}) \Rightarrow \text{tptptypes_5}_{387}(\text{aRG}_1, \text{c_pushingwithfingers})) \quad \text{fof}(\text{query}_{162}, \text{conjecture})$

CSR062+4.p Autogenerated Cyc Problem CSR062+4

include('Axioms/CSR002+3.ax')

$\exists \text{aRG}_1: (\text{mtvisible}(\text{c_tptp_member3205_mt}) \Rightarrow \text{tptptypes_5}_{387}(\text{aRG}_1, \text{c_pushingwithfingers})) \quad \text{fof}(\text{query}_{212}, \text{conjecture})$

CSR062+5.p Autogenerated Cyc Problem CSR062+5

include('Axioms/CSR002+4.ax')

$\exists \text{aRG}_1: (\text{mtvisible}(\text{c_tptp_member3205_mt}) \Rightarrow \text{tptptypes_5}_{387}(\text{aRG}_1, \text{c_pushingwithfingers})) \quad \text{fof}(\text{query}_{262}, \text{conjecture})$

CSR062+6.p Autogenerated Cyc Problem CSR062+6

include('Axioms/CSR002+5.ax')

$\exists \text{aRG}_1: (\text{mtvisible}(\text{c_tptp_member3205_mt}) \Rightarrow \text{tptptypes_5}_{387}(\text{aRG}_1, \text{c_pushingwithfingers})) \quad \text{fof}(\text{query}_{312}, \text{conjecture})$

CSR063+2.p Autogenerated Cyc Problem CSR063+2

include('Axioms/CSR002+1.ax')

$\neg \text{disjointwith}(\text{f_urlreferentfn}(\text{f_urlfn}(\text{s_http_fwsistercitiesorgpdfsmbabanembabane20activity20pages2pdf})), \text{c_tptpcol_16}_{118949})$

CSR063+3.p Autogenerated Cyc Problem CSR063+3

include('Axioms/CSR002+2.ax')

$\neg \text{disjointwith}(\text{f_urlreferentfn}(\text{f_urlfn}(\text{s_http_fwsistercitiesorgpdfsmbabanembabane20activity20pages2pdf})), \text{c_tptpcol_16}_{118949})$

CSR063+4.p Autogenerated Cyc Problem CSR063+4

include('Axioms/CSR002+3.ax')

$\neg \text{disjointwith}(\text{f_urlreferentfn}(\text{f_urlfn}(\text{s_http_fwsistercitiesorgpdfsmbabanembabane20activity20pages2pdf})), \text{c_tptpcol_16}_{118949})$

CSR063+5.p Autogenerated Cyc Problem CSR063+5

include('Axioms/CSR002+4.ax')

$\neg \text{disjointwith}(\text{f_urlreferentfn}(\text{f_urlfn}(\text{s_http_fwsistercitiesorgpdfsmbabanembabane20activity20pages2pdf})), \text{c_tptpcol_16}_{118949})$

CSR063+6.p Autogenerated Cyc Problem CSR063+6

include('Axioms/CSR002+5.ax')

$\neg \text{disjointwith}(\text{f_urlreferentfn}(\text{f_urlfn}(\text{s_http_fwsistercitiesorgpdfsmbabanembabane20activity20pages2pdf})), \text{c_tptpcol_16}_{118949})$

CSR064+2.p Autogenerated Cyc Problem CSR064+2

include('Axioms/CSR002+1.ax')
 \neg gens(f_urlfn(f_urlfn(s_http_wwwahwatukeecomafnentertainmentarticles030423ahtml)), c_tptpcol_15₇₄₇₄₃) fof(query₁₁₄, c)

CSR064+3.p Autogenerated Cyc Problem CSR064+3
include('Axioms/CSR002+2.ax')
 \neg gens(f_urlfn(f_urlfn(s_http_wwwahwatukeecomafnentertainmentarticles030423ahtml)), c_tptpcol_15₇₄₇₄₃) fof(query₁₆₄, c)

CSR064+4.p Autogenerated Cyc Problem CSR064+4
include('Axioms/CSR002+3.ax')
 \neg gens(f_urlfn(f_urlfn(s_http_wwwahwatukeecomafnentertainmentarticles030423ahtml)), c_tptpcol_15₇₄₇₄₃) fof(query₂₁₄, c)

CSR064+5.p Autogenerated Cyc Problem CSR064+5
include('Axioms/CSR002+4.ax')
 \neg gens(f_urlfn(f_urlfn(s_http_wwwahwatukeecomafnentertainmentarticles030423ahtml)), c_tptpcol_15₇₄₇₄₃) fof(query₂₆₄, c)

CSR064+6.p Autogenerated Cyc Problem CSR064+6
include('Axioms/CSR002+5.ax')
 \neg gens(f_urlfn(f_urlfn(s_http_wwwahwatukeecomafnentertainmentarticles030423ahtml)), c_tptpcol_15₇₄₇₄₃) fof(query₃₁₄, c)

CSR065+2.p Autogenerated Cyc Problem CSR065+2
include('Axioms/CSR002+1.ax')
mtvisible(c_tptp_spindlecollectormt) \Rightarrow tptpofobject(c_tptpridgeline_topographical, f_tptpquantityfn₁₃(n_{468})) fof(query₁₁, c)

CSR065+3.p Autogenerated Cyc Problem CSR065+3
include('Axioms/CSR002+2.ax')
mtvisible(c_tptp_spindlecollectormt) \Rightarrow tptpofobject(c_tptpridgeline_topographical, f_tptpquantityfn₁₃(n_{468})) fof(query₁₆, c)

CSR065+4.p Autogenerated Cyc Problem CSR065+4
include('Axioms/CSR002+3.ax')
mtvisible(c_tptp_spindlecollectormt) \Rightarrow tptpofobject(c_tptpridgeline_topographical, f_tptpquantityfn₁₃(n_{468})) fof(query₂₁, c)

CSR065+5.p Autogenerated Cyc Problem CSR065+5
include('Axioms/CSR002+4.ax')
mtvisible(c_tptp_spindlecollectormt) \Rightarrow tptpofobject(c_tptpridgeline_topographical, f_tptpquantityfn₁₃(n_{468})) fof(query₂₆, c)

CSR065+6.p Autogenerated Cyc Problem CSR065+6
include('Axioms/CSR002+5.ax')
mtvisible(c_tptp_spindlecollectormt) \Rightarrow tptpofobject(c_tptpridgeline_topographical, f_tptpquantityfn₁₃(n_{468})) fof(query₃₁, c)

CSR066+2.p Autogenerated Cyc Problem CSR066+2
include('Axioms/CSR002+1.ax')
 $\exists x$: (mtvisible(f_contentmtofcdafromeventfn(f_urlreferentfn(f_urlfn(s_http_webnjiteducjohnsontreebiochhtml)), c_translation₂₁))
(tptp_8₂₇₁(x , c_theprototypicalshavingrazor_manual) and tptpcol_16₂₅₉₇₂(x)) fof(query₁₁₆, conjecture)

CSR066+3.p Autogenerated Cyc Problem CSR066+3
include('Axioms/CSR002+2.ax')
 $\exists x$: (mtvisible(f_contentmtofcdafromeventfn(f_urlreferentfn(f_urlfn(s_http_webnjiteducjohnsontreebiochhtml)), c_translation₂₁))
(tptp_8₂₇₁(x , c_theprototypicalshavingrazor_manual) and tptpcol_16₂₅₉₇₂(x)) fof(query₁₆₆, conjecture)

CSR066+4.p Autogenerated Cyc Problem CSR066+4
include('Axioms/CSR002+3.ax')
 $\exists x$: (mtvisible(f_contentmtofcdafromeventfn(f_urlreferentfn(f_urlfn(s_http_webnjiteducjohnsontreebiochhtml)), c_translation₂₁))
(tptp_8₂₇₁(x , c_theprototypicalshavingrazor_manual) and tptpcol_16₂₅₉₇₂(x)) fof(query₂₁₆, conjecture)

CSR066+5.p Autogenerated Cyc Problem CSR066+5
include('Axioms/CSR002+4.ax')
 $\exists x$: (mtvisible(f_contentmtofcdafromeventfn(f_urlreferentfn(f_urlfn(s_http_webnjiteducjohnsontreebiochhtml)), c_translation₂₁))
(tptp_8₂₇₁(x , c_theprototypicalshavingrazor_manual) and tptpcol_16₂₅₉₇₂(x)) fof(query₂₆₆, conjecture)

CSR066+6.p Autogenerated Cyc Problem CSR066+6
include('Axioms/CSR002+5.ax')
 $\exists x$: (mtvisible(f_contentmtofcdafromeventfn(f_urlreferentfn(f_urlfn(s_http_webnjiteducjohnsontreebiochhtml)), c_translation₂₁))
(tptp_8₂₇₁(x , c_theprototypicalshavingrazor_manual) and tptpcol_16₂₅₉₇₂(x)) fof(query₃₁₆, conjecture)

CSR067+2.p Autogenerated Cyc Problem CSR067+2
include('Axioms/CSR002+1.ax')
 \exists aRG₁: (mtvisible(c_tptpgeo_member7_mt) \Rightarrow borderson(aRG₁, c_georegion_l4_x29_y75)) fof(query₁₁₇, conjecture)

CSR067+3.p Autogenerated Cyc Problem CSR067+3

include('Axioms/CSR002+2.ax')
 $\exists \text{aRG}_1: (\text{mtvisible}(\text{c.tptpgeo_member7_mt}) \Rightarrow \text{borderson}(\text{aRG}_1, \text{c.georegion.l4.x29.y75}))$ fof(query₁₆₇, conjecture)

CSR067+4.p Autogenerated Cyc Problem CSR067+4
 include('Axioms/CSR002+3.ax')
 $\exists \text{aRG}_1: (\text{mtvisible}(\text{c.tptpgeo_member7_mt}) \Rightarrow \text{borderson}(\text{aRG}_1, \text{c.georegion.l4.x29.y75}))$ fof(query₂₁₇, conjecture)

CSR067+5.p Autogenerated Cyc Problem CSR067+5
 include('Axioms/CSR002+4.ax')
 $\exists \text{aRG}_1: (\text{mtvisible}(\text{c.tptpgeo_member7_mt}) \Rightarrow \text{borderson}(\text{aRG}_1, \text{c.georegion.l4.x29.y75}))$ fof(query₂₆₇, conjecture)

CSR067+6.p Autogenerated Cyc Problem CSR067+6
 include('Axioms/CSR002+5.ax')
 $\exists \text{aRG}_1: (\text{mtvisible}(\text{c.tptpgeo_member7_mt}) \Rightarrow \text{borderson}(\text{aRG}_1, \text{c.georegion.l4.x29.y75}))$ fof(query₃₁₇, conjecture)

CSR068+2.p Autogenerated Cyc Problem CSR068+2
 include('Axioms/CSR002+1.ax')
 $\text{mtvisible}(\text{c.tptp_member2356_mt}) \Rightarrow \text{tptpofobject}(\text{c.theprototypicalfurlpelt}, \text{f.tptpquantityfn}_1(n_{328}))$ fof(query₁₁₈, conjecture)

CSR068+3.p Autogenerated Cyc Problem CSR068+3
 include('Axioms/CSR002+2.ax')
 $\text{mtvisible}(\text{c.tptp_member2356_mt}) \Rightarrow \text{tptpofobject}(\text{c.theprototypicalfurlpelt}, \text{f.tptpquantityfn}_1(n_{328}))$ fof(query₁₆₈, conjecture)

CSR068+4.p Autogenerated Cyc Problem CSR068+4
 include('Axioms/CSR002+3.ax')
 $\text{mtvisible}(\text{c.tptp_member2356_mt}) \Rightarrow \text{tptpofobject}(\text{c.theprototypicalfurlpelt}, \text{f.tptpquantityfn}_1(n_{328}))$ fof(query₂₁₈, conjecture)

CSR068+5.p Autogenerated Cyc Problem CSR068+5
 include('Axioms/CSR002+4.ax')
 $\text{mtvisible}(\text{c.tptp_member2356_mt}) \Rightarrow \text{tptpofobject}(\text{c.theprototypicalfurlpelt}, \text{f.tptpquantityfn}_1(n_{328}))$ fof(query₂₆₈, conjecture)

CSR068+6.p Autogenerated Cyc Problem CSR068+6
 include('Axioms/CSR002+5.ax')
 $\text{mtvisible}(\text{c.tptp_member2356_mt}) \Rightarrow \text{tptpofobject}(\text{c.theprototypicalfurlpelt}, \text{f.tptpquantityfn}_1(n_{328}))$ fof(query₃₁₈, conjecture)

CSR069+2.p Autogenerated Cyc Problem CSR069+2
 include('Axioms/CSR002+1.ax')
 $\text{mtvisible}(\text{c.tptpgeo_member1_mt}) \Rightarrow \text{borderson}(\text{c.georegion.l4.x38.y24}, \text{c.georegion.l4.x39.y24})$ fof(query₁₁₉, conjecture)

CSR069+3.p Autogenerated Cyc Problem CSR069+3
 include('Axioms/CSR002+2.ax')
 $\text{mtvisible}(\text{c.tptpgeo_member1_mt}) \Rightarrow \text{borderson}(\text{c.georegion.l4.x38.y24}, \text{c.georegion.l4.x39.y24})$ fof(query₁₆₉, conjecture)

CSR069+4.p Autogenerated Cyc Problem CSR069+4
 include('Axioms/CSR002+3.ax')
 $\text{mtvisible}(\text{c.tptpgeo_member1_mt}) \Rightarrow \text{borderson}(\text{c.georegion.l4.x38.y24}, \text{c.georegion.l4.x39.y24})$ fof(query₂₁₉, conjecture)

CSR069+5.p Autogenerated Cyc Problem CSR069+5
 include('Axioms/CSR002+4.ax')
 $\text{mtvisible}(\text{c.tptpgeo_member1_mt}) \Rightarrow \text{borderson}(\text{c.georegion.l4.x38.y24}, \text{c.georegion.l4.x39.y24})$ fof(query₂₆₉, conjecture)

CSR069+6.p Autogenerated Cyc Problem CSR069+6
 include('Axioms/CSR002+5.ax')
 $\text{mtvisible}(\text{c.tptpgeo_member1_mt}) \Rightarrow \text{borderson}(\text{c.georegion.l4.x38.y24}, \text{c.georegion.l4.x39.y24})$ fof(query₃₁₉, conjecture)

CSR070+2.p Autogenerated Cyc Problem CSR070+2
 include('Axioms/CSR002+1.ax')
 $\text{mtvisible}(\text{c.tptp_spindlecollectormt}) \Rightarrow \text{tptptypes.5}_{802}(\text{f.subcollectionofwithrelationfromtypefn}(\text{c.orientationvector}, \text{c.orientationvector}))$

CSR070+3.p Autogenerated Cyc Problem CSR070+3
 include('Axioms/CSR002+2.ax')
 $\text{mtvisible}(\text{c.tptp_spindlecollectormt}) \Rightarrow \text{tptptypes.5}_{802}(\text{f.subcollectionofwithrelationfromtypefn}(\text{c.orientationvector}, \text{c.orientationvector}))$

CSR070+4.p Autogenerated Cyc Problem CSR070+4
 include('Axioms/CSR002+3.ax')
 $\text{mtvisible}(\text{c.tptp_spindlecollectormt}) \Rightarrow \text{tptptypes.5}_{802}(\text{f.subcollectionofwithrelationfromtypefn}(\text{c.orientationvector}, \text{c.orientationvector}))$

CSR070+5.p Autogenerated Cyc Problem CSR070+5
 include('Axioms/CSR002+4.ax')
 $\text{mtvisible}(\text{c.tptp_spindlecollectormt}) \Rightarrow \text{tptptypes.5}_{802}(\text{f.subcollectionofwithrelationfromtypefn}(\text{c.orientationvector}, \text{c.orientationvector}))$

CSR070+6.p Autogenerated Cyc Problem CSR070+6

include('Axioms/CSR002+5.ax')

mtvisible(c_tptp_spindlecollectormt) \Rightarrow tptptypes_5802(f_subcollectionofwithrelationfromtypefn(c_orientationvector, c_orienta**CSR071+2.p** Autogenerated Cyc Problem CSR071+2

include('Axioms/CSR002+1.ax')

mtvisible(c_tptp_spindlecollectormt) \Rightarrow tptpofobject(c_tptpnavypersonnel₃, f_tptpquantityfn₆(n₄₁₄)) fof(query₁₂₁, conjec**CSR071+3.p** Autogenerated Cyc Problem CSR071+3

include('Axioms/CSR002+2.ax')

mtvisible(c_tptp_spindlecollectormt) \Rightarrow tptpofobject(c_tptpnavypersonnel₃, f_tptpquantityfn₆(n₄₁₄)) fof(query₁₇₁, conjec**CSR071+4.p** Autogenerated Cyc Problem CSR071+4

include('Axioms/CSR002+3.ax')

mtvisible(c_tptp_spindlecollectormt) \Rightarrow tptpofobject(c_tptpnavypersonnel₃, f_tptpquantityfn₆(n₄₁₄)) fof(query₂₂₁, conjec**CSR071+5.p** Autogenerated Cyc Problem CSR071+5

include('Axioms/CSR002+4.ax')

mtvisible(c_tptp_spindlecollectormt) \Rightarrow tptpofobject(c_tptpnavypersonnel₃, f_tptpquantityfn₆(n₄₁₄)) fof(query₂₇₁, conjec**CSR071+6.p** Autogenerated Cyc Problem CSR071+6

include('Axioms/CSR002+5.ax')

mtvisible(c_tptp_spindlecollectormt) \Rightarrow tptpofobject(c_tptpnavypersonnel₃, f_tptpquantityfn₆(n₄₁₄)) fof(query₃₂₁, conjec**CSR072+2.p** Autogenerated Cyc Problem CSR072+2

include('Axioms/CSR002+1.ax')

mtvisible(f_contentmtofcdafromeventfn(f_urlreferentfn(f_urlfn(s_http_wwwarthritis_symptomcoma_cbursitishtm)), c_translatio
gens(c_tptpcol_16₁₃₀₉₂₄, c_tptpcol_15₁₃₀₉₂₃) fof(query₁₂₂, conjecture)**CSR072+3.p** Autogenerated Cyc Problem CSR072+3

include('Axioms/CSR002+2.ax')

mtvisible(f_contentmtofcdafromeventfn(f_urlreferentfn(f_urlfn(s_http_wwwarthritis_symptomcoma_cbursitishtm)), c_translatio
gens(c_tptpcol_16₁₃₀₉₂₄, c_tptpcol_15₁₃₀₉₂₃) fof(query₁₇₂, conjecture)**CSR072+4.p** Autogenerated Cyc Problem CSR072+4

include('Axioms/CSR002+3.ax')

mtvisible(f_contentmtofcdafromeventfn(f_urlreferentfn(f_urlfn(s_http_wwwarthritis_symptomcoma_cbursitishtm)), c_translatio
gens(c_tptpcol_16₁₃₀₉₂₄, c_tptpcol_15₁₃₀₉₂₃) fof(query₂₂₂, conjecture)**CSR072+5.p** Autogenerated Cyc Problem CSR072+5

include('Axioms/CSR002+4.ax')

mtvisible(f_contentmtofcdafromeventfn(f_urlreferentfn(f_urlfn(s_http_wwwarthritis_symptomcoma_cbursitishtm)), c_translatio
gens(c_tptpcol_16₁₃₀₉₂₄, c_tptpcol_15₁₃₀₉₂₃) fof(query₂₇₂, conjecture)**CSR072+6.p** Autogenerated Cyc Problem CSR072+6

include('Axioms/CSR002+5.ax')

mtvisible(f_contentmtofcdafromeventfn(f_urlreferentfn(f_urlfn(s_http_wwwarthritis_symptomcoma_cbursitishtm)), c_translatio
gens(c_tptpcol_16₁₃₀₉₂₄, c_tptpcol_15₁₃₀₉₂₃) fof(query₃₂₂, conjecture)**CSR073+2.p** Autogenerated Cyc Problem CSR073+2

include('Axioms/CSR002+1.ax')

 \exists aRG₁: (mtvisible(c_tptp_spindlecollectormt) \Rightarrow tptptypes_5387(aRG₁, c_pushingababycarriage)) fof(query₁₂₃, conjecture)**CSR073+3.p** Autogenerated Cyc Problem CSR073+3

include('Axioms/CSR002+2.ax')

 \exists aRG₁: (mtvisible(c_tptp_spindlecollectormt) \Rightarrow tptptypes_5387(aRG₁, c_pushingababycarriage)) fof(query₁₇₃, conjecture)**CSR073+4.p** Autogenerated Cyc Problem CSR073+4

include('Axioms/CSR002+3.ax')

 \exists aRG₁: (mtvisible(c_tptp_spindlecollectormt) \Rightarrow tptptypes_5387(aRG₁, c_pushingababycarriage)) fof(query₂₂₃, conjecture)**CSR073+5.p** Autogenerated Cyc Problem CSR073+5

include('Axioms/CSR002+4.ax')

 \exists aRG₁: (mtvisible(c_tptp_spindlecollectormt) \Rightarrow tptptypes_5387(aRG₁, c_pushingababycarriage)) fof(query₂₇₃, conjecture)**CSR073+6.p** Autogenerated Cyc Problem CSR073+6

include('Axioms/CSR002+5.ax')

 \exists aRG₁: (mtvisible(c_tptp_spindlecollectormt) \Rightarrow tptptypes_5387(aRG₁, c_pushingababycarriage)) fof(query₃₂₃, conjecture)

CSR074+2.p Autogenerated Cyc Problem CSR074+2

```
include('Axioms/CSR002+1.ax')
```

```
mtvisible(c_tptpgeo_member7_mt) => (inregion(c_geolocation_x53_y74, c_georegion_l3_x17_y24) and geolevel_3(c_georegion_l3_x17_y24))
```

CSR074+3.p Autogenerated Cyc Problem CSR074+3

```
include('Axioms/CSR002+2.ax')
```

```
mtvisible(c_tptpgeo_member7_mt) => (inregion(c_geolocation_x53_y74, c_georegion_l3_x17_y24) and geolevel_3(c_georegion_l3_x17_y24))
```

CSR074+4.p Autogenerated Cyc Problem CSR074+4

```
include('Axioms/CSR002+3.ax')
```

```
mtvisible(c_tptpgeo_member7_mt) => (inregion(c_geolocation_x53_y74, c_georegion_l3_x17_y24) and geolevel_3(c_georegion_l3_x17_y24))
```

CSR074+5.p Autogenerated Cyc Problem CSR074+5

```
include('Axioms/CSR002+4.ax')
```

```
mtvisible(c_tptpgeo_member7_mt) => (inregion(c_geolocation_x53_y74, c_georegion_l3_x17_y24) and geolevel_3(c_georegion_l3_x17_y24))
```

CSR074+6.p Autogenerated Cyc Problem CSR074+6

```
include('Axioms/CSR002+5.ax')
```

```
mtvisible(c_tptpgeo_member7_mt) => (inregion(c_geolocation_x53_y74, c_georegion_l3_x17_y24) and geolevel_3(c_georegion_l3_x17_y24))
```

CSR075+1.p Class subsumption, skolemization

```
include('Axioms/CSR003+0.ax')
```

```
include('Axioms/CSR003+3.ax')
```

```
s__instance(s__Org1_1, s__Organization) fof(local_1, axiom)
```

```
∃v_MEMBER: s__member(v_MEMBER, s__Org1_1) fof(prove_from_SUMO, conjecture)
```

CSR075+2.p Class subsumption, skolemization

```
include('Axioms/CSR003+1.ax')
```

```
include('Axioms/CSR003+4.ax')
```

```
s__instance(s__Org1_1, s__Organization) fof(local_1, axiom)
```

```
∃v_MEMBER: s__member(v_MEMBER, s__Org1_1) fof(prove_from_SUMO_MILO, conjecture)
```

CSR075+3.p Class subsumption, skolemization

```
include('Axioms/CSR003+2.ax')
```

```
include('Axioms/CSR003+5.ax')
```

```
s__instance(s__Org1_1, s__Organization) fof(local_1, axiom)
```

```
∃v_MEMBER: s__member(v_MEMBER, s__Org1_1) fof(prove_from_ALL, conjecture)
```

CSR075+4.p Class subsumption, skolemization

```
include('Axioms/CSR003+0.ax')
```

```
s__instance(s__Org1_1, s__Organization) fof(local_1, axiom)
```

```
∃v_MEMBER: s__member(v_MEMBER, s__Org1_1) fof(prove_from_SUMO, conjecture)
```

CSR075+5.p Class subsumption, skolemization

```
include('Axioms/CSR003+1.ax')
```

```
s__instance(s__Org1_1, s__Organization) fof(local_1, axiom)
```

```
∃v_MEMBER: s__member(v_MEMBER, s__Org1_1) fof(prove_from_SUMO_MILO, conjecture)
```

CSR075+6.p Class subsumption, skolemization

```
include('Axioms/CSR003+2.ax')
```

```
s__instance(s__Org1_1, s__Organization) fof(local_1, axiom)
```

```
∃v_MEMBER: s__member(v_MEMBER, s__Org1_1) fof(prove_from_ALL, conjecture)
```

CSR076+1.p Relation subsumption

```
include('Axioms/CSR003+0.ax')
```

```
include('Axioms/CSR003+3.ax')
```

```
s__instance(s__TheKB2_1, s__ComputerProgram) fof(local_1, axiom)
```

```
s__instance(s__Inconsistent, s__Attribute) fof(local_2, axiom)
```

```
∀v_ATTR1, v_ATTR2, v_X: ((s__instance(v_ATTR1, s__Attribute) and s__instance(v_ATTR2, s__Attribute)) => ((s__contraryAxiom(s__TheKB2_1, s__Inconsistent))))
```

```
fof(local_3, axiom)
```

```
s__instance(s__Entity2_1, s__Organism) fof(local_4, axiom)
```

```
s__instance(s__Entity2_2, s__Organism) fof(local_5, axiom)
```

```
s__mother(s__Entity2_1, s__Entity2_2) fof(local_6, axiom)
```

```
s__father(s__Entity2_1, s__Entity2_2) fof(local_7, axiom)
```

```
s__property(s__TheKB2_1, s__Inconsistent) fof(prove_from_SUMO, conjecture)
```

CSR076+2.p Relation subsumption


```

include('Axioms/CSR003+1.ax')
include('Axioms/CSR003+4.ax')
s__instance(s__TheKB21, s__ComputerProgram)    fof(local1, axiom)
s__instance(s__Inconsistent, s__Attribute)      fof(local2, axiom)
∀v_ATTR1, v_ATTR2, v_X: ((s__instance(v_ATTR1, s__Attribute) and s__instance(v_ATTR2, s__Attribute)) ⇒ ((s__contraryA
s__property(s__TheKB21, s__Inconsistent))))    fof(local3, axiom)
s__instance(s__Entity21, s__Organism)          fof(local4, axiom)
s__instance(s__Entity22, s__Organism)          fof(local5, axiom)
s__mother(s__Entity21, s__Entity22)           fof(local6, axiom)
s__father(s__Entity21, s__Entity22)           fof(local7, axiom)
s__property(s__TheKB21, s__Inconsistent)       fof(prove_from_SUMO_MILO, conjecture)

```

CSR076+3.p Relation subsumption

```

include('Axioms/CSR003+2.ax')
include('Axioms/CSR003+5.ax')
s__instance(s__TheKB21, s__ComputerProgram)    fof(local1, axiom)
s__instance(s__Inconsistent, s__Attribute)      fof(local2, axiom)
∀v_ATTR1, v_ATTR2, v_X: ((s__instance(v_ATTR1, s__Attribute) and s__instance(v_ATTR2, s__Attribute)) ⇒ ((s__contraryA
s__property(s__TheKB21, s__Inconsistent))))    fof(local3, axiom)
s__instance(s__Entity21, s__Organism)          fof(local4, axiom)
s__instance(s__Entity22, s__Organism)          fof(local5, axiom)
s__mother(s__Entity21, s__Entity22)           fof(local6, axiom)
s__father(s__Entity21, s__Entity22)           fof(local7, axiom)
s__property(s__TheKB21, s__Inconsistent)       fof(prove_from_ALL, conjecture)

```

CSR076+4.p Relation subsumption

```

include('Axioms/CSR003+0.ax')
s__instance(s__TheKB21, s__ComputerProgram)    fof(local1, axiom)
s__instance(s__Inconsistent, s__Attribute)      fof(local2, axiom)
∀v_ATTR1, v_ATTR2, v_X: ((s__instance(v_ATTR1, s__Attribute) and s__instance(v_ATTR2, s__Attribute)) ⇒ ((s__contraryA
s__property(s__TheKB21, s__Inconsistent))))    fof(local3, axiom)
s__instance(s__Entity21, s__Organism)          fof(local4, axiom)
s__instance(s__Entity22, s__Organism)          fof(local5, axiom)
s__mother(s__Entity21, s__Entity22)           fof(local6, axiom)
s__father(s__Entity21, s__Entity22)           fof(local7, axiom)
s__property(s__TheKB21, s__Inconsistent)       fof(prove_from_SUMO, conjecture)

```

CSR076+5.p Relation subsumption

```

include('Axioms/CSR003+1.ax')
s__instance(s__TheKB21, s__ComputerProgram)    fof(local1, axiom)
s__instance(s__Inconsistent, s__Attribute)      fof(local2, axiom)
∀v_ATTR1, v_ATTR2, v_X: ((s__instance(v_ATTR1, s__Attribute) and s__instance(v_ATTR2, s__Attribute)) ⇒ ((s__contraryA
s__property(s__TheKB21, s__Inconsistent))))    fof(local3, axiom)
s__instance(s__Entity21, s__Organism)          fof(local4, axiom)
s__instance(s__Entity22, s__Organism)          fof(local5, axiom)
s__mother(s__Entity21, s__Entity22)           fof(local6, axiom)
s__father(s__Entity21, s__Entity22)           fof(local7, axiom)
s__property(s__TheKB21, s__Inconsistent)       fof(prove_from_SUMO_MILO, conjecture)

```

CSR076+6.p Relation subsumption

```

include('Axioms/CSR003+2.ax')
s__instance(s__TheKB21, s__ComputerProgram)    fof(local1, axiom)
s__instance(s__Inconsistent, s__Attribute)      fof(local2, axiom)
∀v_ATTR1, v_ATTR2, v_X: ((s__instance(v_ATTR1, s__Attribute) and s__instance(v_ATTR2, s__Attribute)) ⇒ ((s__contraryA
s__property(s__TheKB21, s__Inconsistent))))    fof(local3, axiom)
s__instance(s__Entity21, s__Organism)          fof(local4, axiom)
s__instance(s__Entity22, s__Organism)          fof(local5, axiom)
s__mother(s__Entity21, s__Entity22)           fof(local6, axiom)
s__father(s__Entity21, s__Entity22)           fof(local7, axiom)
s__property(s__TheKB21, s__Inconsistent)       fof(prove_from_ALL, conjecture)

```

CSR076+7.p Relation subsumption

```

include('Axioms/CSR003+2.ax')
s__instance(s__TheKB21, s__ComputerProgram)    fof(local1, axiom)
s__instance(s__Inconsistent, s__Attribute)     fof(local2, axiom)
∀v_ATTR1, v_ATTR2, v_X: ((s__instance(v_ATTR1, s__Attribute) and s__instance(v_ATTR2, s__Attribute)) ⇒ ((s__contraryA
s__property(s__TheKB21, s__Inconsistent))))    fof(local3, axiom)
s__instance(s__Entity21, s__Organism)         fof(local4, axiom)
s__instance(s__Entity22, s__Organism)         fof(local5, axiom)
s__mother(s__Entity21, s__Entity22)          fof(local6, axiom)
s__father(s__Entity21, s__Entity22)          fof(local7, axiom)
∃x_s__TheKB21: s__property(x_s__TheKB21, s__Inconsistent)    fof(prove_from_ALL, conjecture)

```

CSR077+1.p Case elimination reasoning

```

include('Axioms/CSR003+0.ax')
include('Axioms/CSR003+3.ax')
s__instance(s__Number31, s__NonnegativeRealNumber)    fof(local1, axiom)
¬s__instance(s__Number31, s__NegativeRealNumber)      fof(prove_from_SUMO, conjecture)

```

CSR077+2.p Case elimination reasoning

```

include('Axioms/CSR003+1.ax')
include('Axioms/CSR003+4.ax')
s__instance(s__Number31, s__NonnegativeRealNumber)    fof(local1, axiom)
¬s__instance(s__Number31, s__NegativeRealNumber)      fof(prove_from_SUMO_MILO, conjecture)

```

CSR077+3.p Case elimination reasoning

```

include('Axioms/CSR003+2.ax')
include('Axioms/CSR003+5.ax')
s__instance(s__Number31, s__NonnegativeRealNumber)    fof(local1, axiom)
¬s__instance(s__Number31, s__NegativeRealNumber)      fof(prove_from_ALL, conjecture)

```

CSR077+4.p Case elimination reasoning

```

include('Axioms/CSR003+0.ax')
s__instance(s__Number31, s__NonnegativeRealNumber)    fof(local1, axiom)
¬s__instance(s__Number31, s__NegativeRealNumber)      fof(prove_from_SUMO, conjecture)

```

CSR077+5.p Case elimination reasoning

```

include('Axioms/CSR003+1.ax')
s__instance(s__Number31, s__NonnegativeRealNumber)    fof(local1, axiom)
¬s__instance(s__Number31, s__NegativeRealNumber)      fof(prove_from_SUMO_MILO, conjecture)

```

CSR077+6.p Case elimination reasoning

```

include('Axioms/CSR003+2.ax')
s__instance(s__Number31, s__NonnegativeRealNumber)    fof(local1, axiom)
¬s__instance(s__Number31, s__NegativeRealNumber)      fof(prove_from_ALL, conjecture)

```

CSR078+1.p Uses holdsDuring

```

include('Axioms/CSR003+0.ax')
include('Axioms/CSR003+3.ax')
s__instance(s__Entity41, s__Human)    fof(local1, axiom)
s__instance(s__DoingSomething41, s__IntentionalProcess)    fof(local2, axiom)
s__agent(s__DoingSomething41, s__Entity41)    fof(local3, axiom)
∀v_PROC, v_AGENT: ((s__instance(v_PROC, s__Process) and s__instance(v_AGENT, s__Agent)) ⇒ ((s__agent(v_PROC, v_AGENT)
(s__instance(v_AGENT, s__CognitiveAgent) and ¬s__holdsDuring(s__WhenFn(v_PROC), 's__attribute(V_AGENT, s__Dead)'))),
¬s__holdsDuring(s__WhenFn(s__DoingSomething41, 's__attribute(s__Entity41, s__Dead)'))    fof(prove_from_SUMO, conjecture)

```

CSR078+2.p Uses holdsDuring

```

include('Axioms/CSR003+1.ax')
include('Axioms/CSR003+4.ax')
s__instance(s__Entity41, s__Human)    fof(local1, axiom)
s__instance(s__DoingSomething41, s__IntentionalProcess)    fof(local2, axiom)
s__agent(s__DoingSomething41, s__Entity41)    fof(local3, axiom)
∀v_PROC, v_AGENT: ((s__instance(v_PROC, s__Process) and s__instance(v_AGENT, s__Agent)) ⇒ ((s__agent(v_PROC, v_AGENT)
(s__instance(v_AGENT, s__CognitiveAgent) and ¬s__holdsDuring(s__WhenFn(v_PROC), 's__attribute(V_AGENT, s__Dead)'))),
¬s__holdsDuring(s__WhenFn(s__DoingSomething41, 's__attribute(s__Entity41, s__Dead)'))    fof(prove_from_SUMO_MILO, conjecture)

```

CSR078+3.p Uses holdsDuring

```

include('Axioms/CSR003+2.ax')
include('Axioms/CSR003+5.ax')
s__instance(s__Entity41, s__Human)      fof(local1, axiom)
s__instance(s__DoingSomething41, s__IntentionalProcess)  fof(local2, axiom)
s__agent(s__DoingSomething41, s__Entity41)      fof(local3, axiom)
∀v_PROC, v_AGENT: ((s__instance(v_PROC, s__Process) and s__instance(v_AGENT, s__Agent)) ⇒ ((s__agent(v_PROC, v_AGENT)
(s__instance(v_AGENT, s__CognitiveAgent) and ¬s__holdsDuring(s__WhenFn(v_PROC), 's__attribute(V_AGENT, s__Dead)')),
¬s__holdsDuring(s__WhenFn(s__DoingSomething41), 's__attribute(s__Entity4.1, s__Dead)'))      fof(prove_from_ALL, conjecture

```

CSR078+4.p Uses holdsDuring

```

include('Axioms/CSR003+0.ax')
s__instance(s__Entity41, s__Human)      fof(local1, axiom)
s__instance(s__DoingSomething41, s__IntentionalProcess)  fof(local2, axiom)
s__agent(s__DoingSomething41, s__Entity41)      fof(local3, axiom)
∀v_PROC, v_AGENT: ((s__instance(v_PROC, s__Process) and s__instance(v_AGENT, s__Agent)) ⇒ ((s__agent(v_PROC, v_AGENT)
(s__instance(v_AGENT, s__CognitiveAgent) and ¬s__holdsDuring(s__WhenFn(v_PROC), 's__attribute(V_AGENT, s__Dead)')),
¬s__holdsDuring(s__WhenFn(s__DoingSomething41), 's__attribute(s__Entity4.1, s__Dead)'))      fof(prove_from_SUMO, conjecture

```

CSR078+5.p Uses holdsDuring

```

include('Axioms/CSR003+1.ax')
s__instance(s__Entity41, s__Human)      fof(local1, axiom)
s__instance(s__DoingSomething41, s__IntentionalProcess)  fof(local2, axiom)
s__agent(s__DoingSomething41, s__Entity41)      fof(local3, axiom)
∀v_PROC, v_AGENT: ((s__instance(v_PROC, s__Process) and s__instance(v_AGENT, s__Agent)) ⇒ ((s__agent(v_PROC, v_AGENT)
(s__instance(v_AGENT, s__CognitiveAgent) and ¬s__holdsDuring(s__WhenFn(v_PROC), 's__attribute(V_AGENT, s__Dead)')),
¬s__holdsDuring(s__WhenFn(s__DoingSomething41), 's__attribute(s__Entity4.1, s__Dead)'))      fof(prove_from_SUMO_MILO, c

```

CSR078+6.p Uses holdsDuring

```

include('Axioms/CSR003+2.ax')
s__instance(s__Entity41, s__Human)      fof(local1, axiom)
s__instance(s__DoingSomething41, s__IntentionalProcess)  fof(local2, axiom)
s__agent(s__DoingSomething41, s__Entity41)      fof(local3, axiom)
∀v_PROC, v_AGENT: ((s__instance(v_PROC, s__Process) and s__instance(v_AGENT, s__Agent)) ⇒ ((s__agent(v_PROC, v_AGENT)
(s__instance(v_AGENT, s__CognitiveAgent) and ¬s__holdsDuring(s__WhenFn(v_PROC), 's__attribute(V_AGENT, s__Dead)')),
¬s__holdsDuring(s__WhenFn(s__DoingSomething41), 's__attribute(s__Entity4.1, s__Dead)'))      fof(prove_from_ALL, conjecture

```

CSR079+1.p Class equality and subsumption reasoning

```

include('Axioms/CSR003+0.ax')
include('Axioms/CSR003+3.ax')
s__instance(s__Lizard51, s__Class)      fof(local1, axiom)
s__instance(s__Organism51, s__Lizard51)      fof(local2, axiom)
s__instance(s__Class51, s__Class)      fof(local3, axiom)
s__subclass(s__Class51, s__Organism)      fof(local4, axiom)
s__instance(s__Class52, s__Class)      fof(local5, axiom)
s__subclass(s__Class52, s__Organism)      fof(local6, axiom)
s__instance(s__Class53, s__Class)      fof(local7, axiom)
s__subclass(s__Class53, s__Organism)      fof(local8, axiom)
s__instance(s__Class54, s__Class)      fof(local9, axiom)
s__subclass(s__Class54, s__Organism)      fof(local10, axiom)
s__instance(s__Class55, s__Class)      fof(local11, axiom)
s__subclass(s__Class55, s__Organism)      fof(local12, axiom)
s__instance(s__Class56, s__Class)      fof(local13, axiom)
s__subclass(s__Class56, s__Organism)      fof(local14, axiom)
s__instance(s__Class57, s__Class)      fof(local15, axiom)
s__subclass(s__Class57, s__Organism)      fof(local16, axiom)
s__instance(s__Class58, s__Class)      fof(local17, axiom)
s__subclass(s__Class58, s__Organism)      fof(local18, axiom)
s__instance(s__Class59, s__Class)      fof(local19, axiom)
s__subclass(s__Class59, s__Organism)      fof(local20, axiom)
s__instance(s__Class510, s__Class)      fof(local21, axiom)
s__subclass(s__Class510, s__Organism)      fof(local22, axiom)

```

```

s__Class5_1 = s__Class5_2    fof(local23, axiom)
s__Class5_2 = s__Class5_3    fof(local24, axiom)
s__Class5_3 = s__Class5_4    fof(local25, axiom)
s__Class5_4 = s__Class5_5    fof(local26, axiom)
s__Class5_5 = s__Class5_6    fof(local27, axiom)
s__Class5_6 = s__Class5_7    fof(local28, axiom)
s__Class5_7 = s__Class5_8    fof(local29, axiom)
s__Class5_8 = s__Class5_9    fof(local30, axiom)
s__Class5_9 = s__Class5_10   fof(local31, axiom)
s__subclass(s__Lizard5_1, s__Class5_1)    fof(local32, axiom)
s__subclass(s__Class5_10, s__Reptile)     fof(local33, axiom)
s__instance(s__Organism5_1, s__Animal)    fof(prove_from_SUMO, conjecture)

```

CSR079+2.p Class equality and subsumption reasoning

```

include('Axioms/CSR003+1.ax')
include('Axioms/CSR003+4.ax')
s__instance(s__Lizard5_1, s__Class)    fof(local1, axiom)
s__instance(s__Organism5_1, s__Lizard5_1)    fof(local2, axiom)
s__instance(s__Class5_1, s__Class)    fof(local3, axiom)
s__subclass(s__Class5_1, s__Organism)    fof(local4, axiom)
s__instance(s__Class5_2, s__Class)    fof(local5, axiom)
s__subclass(s__Class5_2, s__Organism)    fof(local6, axiom)
s__instance(s__Class5_3, s__Class)    fof(local7, axiom)
s__subclass(s__Class5_3, s__Organism)    fof(local8, axiom)
s__instance(s__Class5_4, s__Class)    fof(local9, axiom)
s__subclass(s__Class5_4, s__Organism)    fof(local10, axiom)
s__instance(s__Class5_5, s__Class)    fof(local11, axiom)
s__subclass(s__Class5_5, s__Organism)    fof(local12, axiom)
s__instance(s__Class5_6, s__Class)    fof(local13, axiom)
s__subclass(s__Class5_6, s__Organism)    fof(local14, axiom)
s__instance(s__Class5_7, s__Class)    fof(local15, axiom)
s__subclass(s__Class5_7, s__Organism)    fof(local16, axiom)
s__instance(s__Class5_8, s__Class)    fof(local17, axiom)
s__subclass(s__Class5_8, s__Organism)    fof(local18, axiom)
s__instance(s__Class5_9, s__Class)    fof(local19, axiom)
s__subclass(s__Class5_9, s__Organism)    fof(local20, axiom)
s__instance(s__Class5_10, s__Class)    fof(local21, axiom)
s__subclass(s__Class5_10, s__Organism)    fof(local22, axiom)
s__Class5_1 = s__Class5_2    fof(local23, axiom)
s__Class5_2 = s__Class5_3    fof(local24, axiom)
s__Class5_3 = s__Class5_4    fof(local25, axiom)
s__Class5_4 = s__Class5_5    fof(local26, axiom)
s__Class5_5 = s__Class5_6    fof(local27, axiom)
s__Class5_6 = s__Class5_7    fof(local28, axiom)
s__Class5_7 = s__Class5_8    fof(local29, axiom)
s__Class5_8 = s__Class5_9    fof(local30, axiom)
s__Class5_9 = s__Class5_10   fof(local31, axiom)
s__subclass(s__Lizard5_1, s__Class5_1)    fof(local32, axiom)
s__subclass(s__Class5_10, s__Reptile)     fof(local33, axiom)
s__instance(s__Organism5_1, s__Animal)    fof(prove_from_SUMO_MILO, conjecture)

```

CSR079+3.p Class equality and subsumption reasoning

```

include('Axioms/CSR003+2.ax')
include('Axioms/CSR003+5.ax')
s__instance(s__Lizard5_1, s__Class)    fof(local1, axiom)
s__instance(s__Organism5_1, s__Lizard5_1)    fof(local2, axiom)
s__instance(s__Class5_1, s__Class)    fof(local3, axiom)
s__subclass(s__Class5_1, s__Organism)    fof(local4, axiom)
s__instance(s__Class5_2, s__Class)    fof(local5, axiom)
s__subclass(s__Class5_2, s__Organism)    fof(local6, axiom)

```

```

s__instance(s__Class53, s__Class)    fof(local7, axiom)
s__subclass(s__Class53, s__Organism) fof(local8, axiom)
s__instance(s__Class54, s__Class)    fof(local9, axiom)
s__subclass(s__Class54, s__Organism) fof(local10, axiom)
s__instance(s__Class55, s__Class)    fof(local11, axiom)
s__subclass(s__Class55, s__Organism) fof(local12, axiom)
s__instance(s__Class56, s__Class)    fof(local13, axiom)
s__subclass(s__Class56, s__Organism) fof(local14, axiom)
s__instance(s__Class57, s__Class)    fof(local15, axiom)
s__subclass(s__Class57, s__Organism) fof(local16, axiom)
s__instance(s__Class58, s__Class)    fof(local17, axiom)
s__subclass(s__Class58, s__Organism) fof(local18, axiom)
s__instance(s__Class59, s__Class)    fof(local19, axiom)
s__subclass(s__Class59, s__Organism) fof(local20, axiom)
s__instance(s__Class510, s__Class)   fof(local21, axiom)
s__subclass(s__Class510, s__Organism) fof(local22, axiom)
s__Class51 = s__Class52    fof(local23, axiom)
s__Class52 = s__Class53    fof(local24, axiom)
s__Class53 = s__Class54    fof(local25, axiom)
s__Class54 = s__Class55    fof(local26, axiom)
s__Class55 = s__Class56    fof(local27, axiom)
s__Class56 = s__Class57    fof(local28, axiom)
s__Class57 = s__Class58    fof(local29, axiom)
s__Class58 = s__Class59    fof(local30, axiom)
s__Class59 = s__Class510   fof(local31, axiom)
s__subclass(s__Lizard51, s__Class51) fof(local32, axiom)
s__subclass(s__Class510, s__Reptile) fof(local33, axiom)
s__instance(s__Organism51, s__Animal) fof(prove_from_ALL, conjecture)

```

CSR079+4.p Class equality and subsumption reasoning

```

include('Axioms/CSR003+0.ax')
s__instance(s__Lizard51, s__Class)    fof(local1, axiom)
s__instance(s__Organism51, s__Lizard51) fof(local2, axiom)
s__instance(s__Class51, s__Class)    fof(local3, axiom)
s__subclass(s__Class51, s__Organism) fof(local4, axiom)
s__instance(s__Class52, s__Class)    fof(local5, axiom)
s__subclass(s__Class52, s__Organism) fof(local6, axiom)
s__instance(s__Class53, s__Class)    fof(local7, axiom)
s__subclass(s__Class53, s__Organism) fof(local8, axiom)
s__instance(s__Class54, s__Class)    fof(local9, axiom)
s__subclass(s__Class54, s__Organism) fof(local10, axiom)
s__instance(s__Class55, s__Class)    fof(local11, axiom)
s__subclass(s__Class55, s__Organism) fof(local12, axiom)
s__instance(s__Class56, s__Class)    fof(local13, axiom)
s__subclass(s__Class56, s__Organism) fof(local14, axiom)
s__instance(s__Class57, s__Class)    fof(local15, axiom)
s__subclass(s__Class57, s__Organism) fof(local16, axiom)
s__instance(s__Class58, s__Class)    fof(local17, axiom)
s__subclass(s__Class58, s__Organism) fof(local18, axiom)
s__instance(s__Class59, s__Class)    fof(local19, axiom)
s__subclass(s__Class59, s__Organism) fof(local20, axiom)
s__instance(s__Class510, s__Class)   fof(local21, axiom)
s__subclass(s__Class510, s__Organism) fof(local22, axiom)
s__Class51 = s__Class52    fof(local23, axiom)
s__Class52 = s__Class53    fof(local24, axiom)
s__Class53 = s__Class54    fof(local25, axiom)
s__Class54 = s__Class55    fof(local26, axiom)
s__Class55 = s__Class56    fof(local27, axiom)
s__Class56 = s__Class57    fof(local28, axiom)
s__Class57 = s__Class58    fof(local29, axiom)

```

```

s__Class58 = s__Class59    fof(local30, axiom)
s__Class59 = s__Class510  fof(local31, axiom)
s__subclass(s__Lizard51, s__Class51)    fof(local32, axiom)
s__subclass(s__Class510, s__Reptile)    fof(local33, axiom)
s__instance(s__Organism51, s__Animal)   fof(prove_from_SUMO, conjecture)

```

CSR079+5.p Class equality and subsumption reasoning

include('Axioms/CSR003+1.ax')

```

s__instance(s__Lizard51, s__Class)    fof(local1, axiom)
s__instance(s__Organism51, s__Lizard51)    fof(local2, axiom)
s__instance(s__Class51, s__Class)    fof(local3, axiom)
s__subclass(s__Class51, s__Organism)    fof(local4, axiom)
s__instance(s__Class52, s__Class)    fof(local5, axiom)
s__subclass(s__Class52, s__Organism)    fof(local6, axiom)
s__instance(s__Class53, s__Class)    fof(local7, axiom)
s__subclass(s__Class53, s__Organism)    fof(local8, axiom)
s__instance(s__Class54, s__Class)    fof(local9, axiom)
s__subclass(s__Class54, s__Organism)    fof(local10, axiom)
s__instance(s__Class55, s__Class)    fof(local11, axiom)
s__subclass(s__Class55, s__Organism)    fof(local12, axiom)
s__instance(s__Class56, s__Class)    fof(local13, axiom)
s__subclass(s__Class56, s__Organism)    fof(local14, axiom)
s__instance(s__Class57, s__Class)    fof(local15, axiom)
s__subclass(s__Class57, s__Organism)    fof(local16, axiom)
s__instance(s__Class58, s__Class)    fof(local17, axiom)
s__subclass(s__Class58, s__Organism)    fof(local18, axiom)
s__instance(s__Class59, s__Class)    fof(local19, axiom)
s__subclass(s__Class59, s__Organism)    fof(local20, axiom)
s__instance(s__Class510, s__Class)    fof(local21, axiom)
s__subclass(s__Class510, s__Organism)    fof(local22, axiom)
s__Class51 = s__Class52    fof(local23, axiom)
s__Class52 = s__Class53    fof(local24, axiom)
s__Class53 = s__Class54    fof(local25, axiom)
s__Class54 = s__Class55    fof(local26, axiom)
s__Class55 = s__Class56    fof(local27, axiom)
s__Class56 = s__Class57    fof(local28, axiom)
s__Class57 = s__Class58    fof(local29, axiom)
s__Class58 = s__Class59    fof(local30, axiom)
s__Class59 = s__Class510    fof(local31, axiom)
s__subclass(s__Lizard51, s__Class51)    fof(local32, axiom)
s__subclass(s__Class510, s__Reptile)    fof(local33, axiom)
s__instance(s__Organism51, s__Animal)   fof(prove_from_SUMO_MILO, conjecture)

```

CSR079+6.p Class equality and subsumption reasoning

include('Axioms/CSR003+2.ax')

```

s__instance(s__Lizard51, s__Class)    fof(local1, axiom)
s__instance(s__Organism51, s__Lizard51)    fof(local2, axiom)
s__instance(s__Class51, s__Class)    fof(local3, axiom)
s__subclass(s__Class51, s__Organism)    fof(local4, axiom)
s__instance(s__Class52, s__Class)    fof(local5, axiom)
s__subclass(s__Class52, s__Organism)    fof(local6, axiom)
s__instance(s__Class53, s__Class)    fof(local7, axiom)
s__subclass(s__Class53, s__Organism)    fof(local8, axiom)
s__instance(s__Class54, s__Class)    fof(local9, axiom)
s__subclass(s__Class54, s__Organism)    fof(local10, axiom)
s__instance(s__Class55, s__Class)    fof(local11, axiom)
s__subclass(s__Class55, s__Organism)    fof(local12, axiom)
s__instance(s__Class56, s__Class)    fof(local13, axiom)
s__subclass(s__Class56, s__Organism)    fof(local14, axiom)
s__instance(s__Class57, s__Class)    fof(local15, axiom)

```

```

s__subclass(s__Class57, s__Organism)    fof(local16, axiom)
s__instance(s__Class58, s__Class)      fof(local17, axiom)
s__subclass(s__Class58, s__Organism)    fof(local18, axiom)
s__instance(s__Class59, s__Class)      fof(local19, axiom)
s__subclass(s__Class59, s__Organism)    fof(local20, axiom)
s__instance(s__Class510, s__Class)     fof(local21, axiom)
s__subclass(s__Class510, s__Organism)   fof(local22, axiom)
s__Class51 = s__Class52    fof(local23, axiom)
s__Class52 = s__Class53    fof(local24, axiom)
s__Class53 = s__Class54    fof(local25, axiom)
s__Class54 = s__Class55    fof(local26, axiom)
s__Class55 = s__Class56    fof(local27, axiom)
s__Class56 = s__Class57    fof(local28, axiom)
s__Class57 = s__Class58    fof(local29, axiom)
s__Class58 = s__Class59    fof(local30, axiom)
s__Class59 = s__Class510   fof(local31, axiom)
s__subclass(s__Lizard51, s__Class51)    fof(local32, axiom)
s__subclass(s__Class510, s__Reptile)    fof(local33, axiom)
s__instance(s__Organism51, s__Animal)   fof(prove_from_ALL, conjecture)

```

CSR079+7.p Class equality and subsumption reasoning

```
include('Axioms/CSR003+2.ax')
```

```

s__instance(s__Lizard51, s__Class)      fof(local1, axiom)
s__instance(s__Organism51, s__Lizard51) fof(local2, axiom)
s__instance(s__Class51, s__Class)       fof(local3, axiom)
s__subclass(s__Class51, s__Organism)    fof(local4, axiom)
s__instance(s__Class52, s__Class)       fof(local5, axiom)
s__subclass(s__Class52, s__Organism)    fof(local6, axiom)
s__instance(s__Class53, s__Class)       fof(local7, axiom)
s__subclass(s__Class53, s__Organism)    fof(local8, axiom)
s__instance(s__Class54, s__Class)       fof(local9, axiom)
s__subclass(s__Class54, s__Organism)    fof(local10, axiom)
s__instance(s__Class55, s__Class)       fof(local11, axiom)
s__subclass(s__Class55, s__Organism)    fof(local12, axiom)
s__instance(s__Class56, s__Class)       fof(local13, axiom)
s__subclass(s__Class56, s__Organism)    fof(local14, axiom)
s__instance(s__Class57, s__Class)       fof(local15, axiom)
s__subclass(s__Class57, s__Organism)    fof(local16, axiom)
s__instance(s__Class58, s__Class)       fof(local17, axiom)
s__subclass(s__Class58, s__Organism)    fof(local18, axiom)
s__instance(s__Class59, s__Class)       fof(local19, axiom)
s__subclass(s__Class59, s__Organism)    fof(local20, axiom)
s__instance(s__Class510, s__Class)      fof(local21, axiom)
s__subclass(s__Class510, s__Organism)   fof(local22, axiom)
s__Class51 = s__Class52    fof(local23, axiom)
s__Class52 = s__Class53    fof(local24, axiom)
s__Class53 = s__Class54    fof(local25, axiom)
s__Class54 = s__Class55    fof(local26, axiom)
s__Class55 = s__Class56    fof(local27, axiom)
s__Class56 = s__Class57    fof(local28, axiom)
s__Class57 = s__Class58    fof(local29, axiom)
s__Class58 = s__Class59    fof(local30, axiom)
s__Class59 = s__Class510   fof(local31, axiom)
s__subclass(s__Lizard51, s__Class51)    fof(local32, axiom)
s__subclass(s__Class510, s__Reptile)    fof(local33, axiom)
∃x_s__Organism51: s__instance(x_s__Organism51, s__Animal)   fof(prove_from_ALL, conjecture)

```

CSR080+1.p Hard parts and pieces

```
include('Axioms/CSR003+0.ax')
```

```
include('Axioms/CSR003+3.ax')
```

```

s__instance(s__Object61, s__Substance)    fof(local1, axiom)
s__instance(s__Object62, s__Substance)    fof(local2, axiom)
s__instance(s__Object63, s__Substance)    fof(local3, axiom)
s__piece(s__Object61, s__Object62)      fof(local4, axiom)
s__piece(s__Object62, s__Object63)      fof(local5, axiom)
s__part(s__Object61, s__Object63)      fof(prove_from_SUMO, conjecture)

```

CSR080+2.p Hard parts and pieces

```

include('Axioms/CSR003+1.ax')
include('Axioms/CSR003+4.ax')
s__instance(s__Object61, s__Substance)    fof(local1, axiom)
s__instance(s__Object62, s__Substance)    fof(local2, axiom)
s__instance(s__Object63, s__Substance)    fof(local3, axiom)
s__piece(s__Object61, s__Object62)      fof(local4, axiom)
s__piece(s__Object62, s__Object63)      fof(local5, axiom)
s__part(s__Object61, s__Object63)      fof(prove_from_SUMO_MILO, conjecture)

```

CSR080+3.p Hard parts and pieces

```

include('Axioms/CSR003+2.ax')
include('Axioms/CSR003+5.ax')
s__instance(s__Object61, s__Substance)    fof(local1, axiom)
s__instance(s__Object62, s__Substance)    fof(local2, axiom)
s__instance(s__Object63, s__Substance)    fof(local3, axiom)
s__piece(s__Object61, s__Object62)      fof(local4, axiom)
s__piece(s__Object62, s__Object63)      fof(local5, axiom)
s__part(s__Object61, s__Object63)      fof(prove_from_ALL, conjecture)

```

CSR080+4.p Hard parts and pieces

```

include('Axioms/CSR003+0.ax')
s__instance(s__Object61, s__Substance)    fof(local1, axiom)
s__instance(s__Object62, s__Substance)    fof(local2, axiom)
s__instance(s__Object63, s__Substance)    fof(local3, axiom)
s__piece(s__Object61, s__Object62)      fof(local4, axiom)
s__piece(s__Object62, s__Object63)      fof(local5, axiom)
s__part(s__Object61, s__Object63)      fof(prove_from_SUMO, conjecture)

```

CSR080+5.p Hard parts and pieces

```

include('Axioms/CSR003+1.ax')
s__instance(s__Object61, s__Substance)    fof(local1, axiom)
s__instance(s__Object62, s__Substance)    fof(local2, axiom)
s__instance(s__Object63, s__Substance)    fof(local3, axiom)
s__piece(s__Object61, s__Object62)      fof(local4, axiom)
s__piece(s__Object62, s__Object63)      fof(local5, axiom)
s__part(s__Object61, s__Object63)      fof(prove_from_SUMO_MILO, conjecture)

```

CSR080+6.p Hard parts and pieces

```

include('Axioms/CSR003+2.ax')
s__instance(s__Object61, s__Substance)    fof(local1, axiom)
s__instance(s__Object62, s__Substance)    fof(local2, axiom)
s__instance(s__Object63, s__Substance)    fof(local3, axiom)
s__piece(s__Object61, s__Object62)      fof(local4, axiom)
s__piece(s__Object62, s__Object63)      fof(local5, axiom)
s__part(s__Object61, s__Object63)      fof(prove_from_ALL, conjecture)

```

CSR081+1.p Family matter

```

include('Axioms/CSR003+0.ax')
include('Axioms/CSR003+3.ax')
s__instance(s__Bill71, s__Man)          fof(local1, axiom)
s__instance(s__Jane71, s__Woman)        fof(local2, axiom)
s__instance(s__Bob71, s__Man)           fof(local3, axiom)
s__mother(s__Bill71, s__Jane71)       fof(local4, axiom)
s__sibling(s__Bob71, s__Bill71)       fof(local5, axiom)
s__mother(s__Bill71, s__Jane71) and s__mother(s__Bob71, s__Jane71)  fof(prove_from_SUMO, conjecture)

```


CSR081+2.p Family matter

```

include('Axioms/CSR003+1.ax')
include('Axioms/CSR003+4.ax')
s__instance(s__Bill71, s__Man)    fof(local1, axiom)
s__instance(s__Jane71, s__Woman)  fof(local2, axiom)
s__instance(s__Bob71, s__Man)    fof(local3, axiom)
s__mother(s__Bill71, s__Jane71)   fof(local4, axiom)
s__sibling(s__Bob71, s__Bill71)   fof(local5, axiom)
s__mother(s__Bill71, s__Jane71) and s__mother(s__Bob71, s__Jane71)  fof(prove_from_SUMO_MILO, conjecture)

```

CSR081+3.p Family matter

```

include('Axioms/CSR003+2.ax')
include('Axioms/CSR003+5.ax')
s__instance(s__Bill71, s__Man)    fof(local1, axiom)
s__instance(s__Jane71, s__Woman)  fof(local2, axiom)
s__instance(s__Bob71, s__Man)    fof(local3, axiom)
s__mother(s__Bill71, s__Jane71)   fof(local4, axiom)
s__sibling(s__Bob71, s__Bill71)   fof(local5, axiom)
s__mother(s__Bill71, s__Jane71) and s__mother(s__Bob71, s__Jane71)  fof(prove_from_ALL, conjecture)

```

CSR081+4.p Family matter

```

include('Axioms/CSR003+0.ax')
s__instance(s__Bill71, s__Man)    fof(local1, axiom)
s__instance(s__Jane71, s__Woman)  fof(local2, axiom)
s__instance(s__Bob71, s__Man)    fof(local3, axiom)
s__mother(s__Bill71, s__Jane71)   fof(local4, axiom)
s__sibling(s__Bob71, s__Bill71)   fof(local5, axiom)
s__mother(s__Bill71, s__Jane71) and s__mother(s__Bob71, s__Jane71)  fof(prove_from_SUMO, conjecture)

```

CSR081+5.p Family matter

```

include('Axioms/CSR003+1.ax')
s__instance(s__Bill71, s__Man)    fof(local1, axiom)
s__instance(s__Jane71, s__Woman)  fof(local2, axiom)
s__instance(s__Bob71, s__Man)    fof(local3, axiom)
s__mother(s__Bill71, s__Jane71)   fof(local4, axiom)
s__sibling(s__Bob71, s__Bill71)   fof(local5, axiom)
s__mother(s__Bill71, s__Jane71) and s__mother(s__Bob71, s__Jane71)  fof(prove_from_SUMO_MILO, conjecture)

```

CSR081+6.p Family matter

```

include('Axioms/CSR003+2.ax')
s__instance(s__Bill71, s__Man)    fof(local1, axiom)
s__instance(s__Jane71, s__Woman)  fof(local2, axiom)
s__instance(s__Bob71, s__Man)    fof(local3, axiom)
s__mother(s__Bill71, s__Jane71)   fof(local4, axiom)
s__sibling(s__Bob71, s__Bill71)   fof(local5, axiom)
s__mother(s__Bill71, s__Jane71) and s__mother(s__Bob71, s__Jane71)  fof(prove_from_ALL, conjecture)

```

CSR081+7.p Family matter

```

include('Axioms/CSR003+2.ax')
s__instance(s__Bill71, s__Man)    fof(local1, axiom)
s__instance(s__Jane71, s__Woman)  fof(local2, axiom)
s__instance(s__Bob71, s__Man)    fof(local3, axiom)
s__mother(s__Bill71, s__Jane71)   fof(local4, axiom)
s__sibling(s__Bob71, s__Bill71)   fof(local5, axiom)
∃x_s__Jane71: (s__mother(s__Bill71, x_s__Jane71) and s__mother(s__Bob71, x_s__Jane71))  fof(prove_from_ALL, conjecture)

```

CSR082+1.p Jane does reasoning and perception

```

include('Axioms/CSR003+0.ax')
include('Axioms/CSR003+3.ax')
s__instance(s__Jane81, s__Human)   fof(local1, axiom)
∃v_ROLE1, v_ROLE2: (s__capability(s__Reasoning, v_ROLE1, s__Jane81) and s__capability(s__Perception, v_ROLE2, s__Jane81))

```

CSR082+2.p Jane does reasoning and perception

```

include('Axioms/CSR003+1.ax')
include('Axioms/CSR003+4.ax')
s__instance(s__Jane81, s__Human)    fof(local1, axiom)
 $\exists v\_ROLE_1, v\_ROLE_2: (s\_capability(s\_Reasoning, v\_ROLE_1, s\_Jane81) \text{ and } s\_capability(s\_Perception, v\_ROLE_2, s\_Jane81))$ 

CSR082+3.p Jane does reasoning and perception
include('Axioms/CSR003+2.ax')
include('Axioms/CSR003+5.ax')
s__instance(s__Jane81, s__Human)    fof(local1, axiom)
 $\exists v\_ROLE_1, v\_ROLE_2: (s\_capability(s\_Reasoning, v\_ROLE_1, s\_Jane81) \text{ and } s\_capability(s\_Perception, v\_ROLE_2, s\_Jane81))$ 

CSR082+4.p Jane does reasoning and perception
include('Axioms/CSR003+0.ax')
s__instance(s__Jane81, s__Human)    fof(local1, axiom)
 $\exists v\_ROLE_1, v\_ROLE_2: (s\_capability(s\_Reasoning, v\_ROLE_1, s\_Jane81) \text{ and } s\_capability(s\_Perception, v\_ROLE_2, s\_Jane81))$ 

CSR082+5.p Jane does reasoning and perception
include('Axioms/CSR003+1.ax')
s__instance(s__Jane81, s__Human)    fof(local1, axiom)
 $\exists v\_ROLE_1, v\_ROLE_2: (s\_capability(s\_Reasoning, v\_ROLE_1, s\_Jane81) \text{ and } s\_capability(s\_Perception, v\_ROLE_2, s\_Jane81))$ 

CSR082+6.p Jane does reasoning and perception
include('Axioms/CSR003+2.ax')
s__instance(s__Jane81, s__Human)    fof(local1, axiom)
 $\exists v\_ROLE_1, v\_ROLE_2: (s\_capability(s\_Reasoning, v\_ROLE_1, s\_Jane81) \text{ and } s\_capability(s\_Perception, v\_ROLE_2, s\_Jane81))$ 

CSR083+1.p Class identification
include('Axioms/CSR003+0.ax')
include('Axioms/CSR003+3.ax')
 $\exists v\_ENTITY: (s\_subclass(v\_ENTITY, s\_Animal) \text{ and } s\_subclass(v\_ENTITY, s\_CognitiveAgent) \text{ and } v\_ENTITY = s\_Human)$     fof(prove_from_SUMO, conjecture)

CSR083+2.p Class identification
include('Axioms/CSR003+1.ax')
include('Axioms/CSR003+4.ax')
 $\exists v\_ENTITY: (s\_subclass(v\_ENTITY, s\_Animal) \text{ and } s\_subclass(v\_ENTITY, s\_CognitiveAgent) \text{ and } v\_ENTITY = s\_Human)$     fof(prove_from_SUMO_MILO, conjecture)

CSR083+3.p Class identification
include('Axioms/CSR003+2.ax')
include('Axioms/CSR003+5.ax')
 $\exists v\_ENTITY: (s\_subclass(v\_ENTITY, s\_Animal) \text{ and } s\_subclass(v\_ENTITY, s\_CognitiveAgent) \text{ and } v\_ENTITY = s\_Human)$     fof(prove_from_ALL, conjecture)

CSR083+4.p Class identification
include('Axioms/CSR003+0.ax')
 $\exists v\_ENTITY: (s\_subclass(v\_ENTITY, s\_Animal) \text{ and } s\_subclass(v\_ENTITY, s\_CognitiveAgent) \text{ and } v\_ENTITY = s\_Human)$     fof(prove_from_SUMO, conjecture)

CSR083+5.p Class identification
include('Axioms/CSR003+1.ax')
 $\exists v\_ENTITY: (s\_subclass(v\_ENTITY, s\_Animal) \text{ and } s\_subclass(v\_ENTITY, s\_CognitiveAgent) \text{ and } v\_ENTITY = s\_Human)$     fof(prove_from_SUMO_MILO, conjecture)

CSR083+6.p Class identification
include('Axioms/CSR003+2.ax')
 $\exists v\_ENTITY: (s\_subclass(v\_ENTITY, s\_Animal) \text{ and } s\_subclass(v\_ENTITY, s\_CognitiveAgent) \text{ and } v\_ENTITY = s\_Human)$     fof(prove_from_ALL, conjecture)

CSR084+1.p Case elimination with multiple rules
include('Axioms/CSR003+0.ax')
include('Axioms/CSR003+3.ax')
 $\forall v\_A: (s\_instance(v\_A, s\_Object) \Rightarrow ((s\_instance(v\_A, s\_Animal) \text{ and } \neg \exists v\_PART: (s\_instance(v\_PART, s\_Object) \text{ and } \neg s\_instance(v\_A, s\_Vertebrate))) \text{ fof(local1, axiom)}$ 
 $\neg \exists v\_SPINE: (s\_instance(v\_SPINE, s\_Object) \text{ and } s\_instance(v\_SPINE, s\_SpinalColumn) \text{ and } s\_part(v\_SPINE, s\_BananaS$ 
 $s\_partition_3(s\_Animal, s\_Vertebrate, s\_Invertebrate) \text{ fof(local3, axiom)$ 

```


$s_partition_3(s_Animal, s_Vertebrate, s_Invertebrate) \quad \text{fof(local}_3, \text{axiom)}$
 $\forall v_SUPER, v_SUB_1, v_SUB_2: ((s_instance(v_SUPER, s_Class) \text{ and } s_instance(v_SUB_1, s_Class) \text{ and } s_instance(v_SUB_2, s_Class) \text{ and } (s_partition_3(v_SUPER, v_SUB_1, v_SUB_2) \Rightarrow s_partition_3(v_SUPER, v_SUB_2, v_SUB_1)))) \quad \text{fof(local}_4, \text{axiom)}$
 $\forall v_SUPER, v_SUB_1, v_SUB_2, v_INST: ((s_instance(v_SUPER, s_Class) \text{ and } s_instance(v_SUB_1, s_Class) \text{ and } s_instance(v_SUB_2, s_Class) \text{ and } (s_partition_3(v_SUPER, v_SUB_1, v_SUB_2) \text{ and } s_instance(v_INST, v_SUPER) \text{ and } \neg s_instance(v_INST, v_SUB_1))) \Rightarrow s_instance(v_INST, v_SUB_2))) \quad \text{fof(local}_5, \text{axiom)}$
 $s_instance(s_BananaSlug10_1, s_Animal) \quad \text{fof(local}_6, \text{axiom)}$
 $s_instance(s_BodyPart10_1, s_BodyPart) \text{ and } s_component(s_BodyPart10_1, s_BananaSlug10_1) \quad \text{fof(local}_7, \text{axiom)}$
 $s_instance(s_BananaSlug10_1, s_Invertebrate) \quad \text{fof(prove_from_SUMO_MILO, conjecture)}$

CSR084+6.p Case elimination with multiple rules

$\text{include('Axioms/CSR003+2.ax')}$
 $\forall v_A: (s_instance(v_A, s_Object) \Rightarrow ((s_instance(v_A, s_Animal) \text{ and } \neg \exists v_PART: (s_instance(v_PART, s_Object) \text{ and } \neg s_instance(v_PART, s_Vertebrate)))) \quad \text{fof(local}_1, \text{axiom)}$
 $\neg \exists v_SPINE: (s_instance(v_SPINE, s_Object) \text{ and } s_instance(v_SPINE, s_SpinalColumn) \text{ and } s_part(v_SPINE, s_BananaSlug10_1)) \quad \text{fof(local}_2, \text{axiom)}$
 $s_partition_3(s_Animal, s_Vertebrate, s_Invertebrate) \quad \text{fof(local}_3, \text{axiom)}$
 $\forall v_SUPER, v_SUB_1, v_SUB_2: ((s_instance(v_SUPER, s_Class) \text{ and } s_instance(v_SUB_1, s_Class) \text{ and } s_instance(v_SUB_2, s_Class) \text{ and } (s_partition_3(v_SUPER, v_SUB_1, v_SUB_2) \Rightarrow s_partition_3(v_SUPER, v_SUB_2, v_SUB_1)))) \quad \text{fof(local}_4, \text{axiom)}$
 $\forall v_SUPER, v_SUB_1, v_SUB_2, v_INST: ((s_instance(v_SUPER, s_Class) \text{ and } s_instance(v_SUB_1, s_Class) \text{ and } s_instance(v_SUB_2, s_Class) \text{ and } (s_partition_3(v_SUPER, v_SUB_1, v_SUB_2) \text{ and } s_instance(v_INST, v_SUPER) \text{ and } \neg s_instance(v_INST, v_SUB_1))) \Rightarrow s_instance(v_INST, v_SUB_2))) \quad \text{fof(local}_5, \text{axiom)}$
 $s_instance(s_BananaSlug10_1, s_Animal) \quad \text{fof(local}_6, \text{axiom)}$
 $s_instance(s_BodyPart10_1, s_BodyPart) \text{ and } s_component(s_BodyPart10_1, s_BananaSlug10_1) \quad \text{fof(local}_7, \text{axiom)}$
 $s_instance(s_BananaSlug10_1, s_Invertebrate) \quad \text{fof(prove_from_ALL, conjecture)}$

CSR084+7.p Case elimination with multiple rules

$\text{include('Axioms/CSR003+2.ax')}$
 $\forall v_A: (s_instance(v_A, s_Object) \Rightarrow ((s_instance(v_A, s_Animal) \text{ and } \neg \exists v_PART: (s_instance(v_PART, s_Object) \text{ and } \neg s_instance(v_PART, s_Vertebrate)))) \quad \text{fof(local}_1, \text{axiom)}$
 $\neg \exists v_SPINE: (s_instance(v_SPINE, s_Object) \text{ and } s_instance(v_SPINE, s_SpinalColumn) \text{ and } s_part(v_SPINE, s_BananaSlug10_1)) \quad \text{fof(local}_2, \text{axiom)}$
 $s_partition_3(s_Animal, s_Vertebrate, s_Invertebrate) \quad \text{fof(local}_3, \text{axiom)}$
 $\forall v_SUPER, v_SUB_1, v_SUB_2: ((s_instance(v_SUPER, s_Class) \text{ and } s_instance(v_SUB_1, s_Class) \text{ and } s_instance(v_SUB_2, s_Class) \text{ and } (s_partition_3(v_SUPER, v_SUB_1, v_SUB_2) \Rightarrow s_partition_3(v_SUPER, v_SUB_2, v_SUB_1)))) \quad \text{fof(local}_4, \text{axiom)}$
 $\forall v_SUPER, v_SUB_1, v_SUB_2, v_INST: ((s_instance(v_SUPER, s_Class) \text{ and } s_instance(v_SUB_1, s_Class) \text{ and } s_instance(v_SUB_2, s_Class) \text{ and } (s_partition_3(v_SUPER, v_SUB_1, v_SUB_2) \text{ and } s_instance(v_INST, v_SUPER) \text{ and } \neg s_instance(v_INST, v_SUB_1))) \Rightarrow s_instance(v_INST, v_SUB_2))) \quad \text{fof(local}_5, \text{axiom)}$
 $s_instance(s_BananaSlug10_1, s_Animal) \quad \text{fof(local}_6, \text{axiom)}$
 $s_instance(s_BodyPart10_1, s_BodyPart) \text{ and } s_component(s_BodyPart10_1, s_BananaSlug10_1) \quad \text{fof(local}_7, \text{axiom)}$
 $\exists x. s_BananaSlug10_1: s_instance(x, s_BananaSlug10_1, s_Invertebrate) \quad \text{fof(prove_from_ALL, conjecture)}$

CSR085+1.p One simple rule

$\text{include('Axioms/CSR003+0.ax')}$
 $\text{include('Axioms/CSR003+3.ax')}$
 $s_instance(s_Organism12_1, s_Object) \quad \text{fof(local}_1, \text{axiom)}$
 $s_attribute(s_Organism12_1, s_Living) \quad \text{fof(local}_2, \text{axiom)}$
 $\forall v_X: (s_instance(v_X, s_Object) \Rightarrow (s_attribute(v_X, s_Living) \Rightarrow s_instance(v_X, s_Organism))) \quad \text{fof(local}_3, \text{axiom)}$
 $s_instance(s_Organism12_1, s_Organism) \quad \text{fof(prove_from_SUMO, conjecture)}$

CSR085+2.p One simple rule

$\text{include('Axioms/CSR003+1.ax')}$
 $\text{include('Axioms/CSR003+4.ax')}$
 $s_instance(s_Organism12_1, s_Object) \quad \text{fof(local}_1, \text{axiom)}$
 $s_attribute(s_Organism12_1, s_Living) \quad \text{fof(local}_2, \text{axiom)}$
 $\forall v_X: (s_instance(v_X, s_Object) \Rightarrow (s_attribute(v_X, s_Living) \Rightarrow s_instance(v_X, s_Organism))) \quad \text{fof(local}_3, \text{axiom)}$
 $s_instance(s_Organism12_1, s_Organism) \quad \text{fof(prove_from_SUMO_MILO, conjecture)}$

CSR085+3.p One simple rule

$\text{include('Axioms/CSR003+2.ax')}$
 $\text{include('Axioms/CSR003+5.ax')}$
 $s_instance(s_Organism12_1, s_Object) \quad \text{fof(local}_1, \text{axiom)}$
 $s_attribute(s_Organism12_1, s_Living) \quad \text{fof(local}_2, \text{axiom)}$
 $\forall v_X: (s_instance(v_X, s_Object) \Rightarrow (s_attribute(v_X, s_Living) \Rightarrow s_instance(v_X, s_Organism))) \quad \text{fof(local}_3, \text{axiom)}$

s__instance(s__Organism12₁, s__Organism) fof(prove_from_ALL, conjecture)

CSR085+4.p One simple rule

include('Axioms/CSR003+0.ax')

s__instance(s__Organism12₁, s__Object) fof(local₁, axiom)

s__attribute(s__Organism12₁, s__Living) fof(local₂, axiom)

$\forall v_X: (s_instance(v_X, s_Object) \Rightarrow (s_attribute(v_X, s_Living) \Rightarrow s_instance(v_X, s_Organism)))$ fof(local₃, axiom)

s__instance(s__Organism12₁, s__Organism) fof(prove_from_SUMO, conjecture)

CSR085+5.p One simple rule

include('Axioms/CSR003+1.ax')

s__instance(s__Organism12₁, s__Object) fof(local₁, axiom)

s__attribute(s__Organism12₁, s__Living) fof(local₂, axiom)

$\forall v_X: (s_instance(v_X, s_Object) \Rightarrow (s_attribute(v_X, s_Living) \Rightarrow s_instance(v_X, s_Organism)))$ fof(local₃, axiom)

s__instance(s__Organism12₁, s__Organism) fof(prove_from_SUMO_MILO, conjecture)

CSR085+6.p One simple rule

include('Axioms/CSR003+2.ax')

s__instance(s__Organism12₁, s__Object) fof(local₁, axiom)

s__attribute(s__Organism12₁, s__Living) fof(local₂, axiom)

$\forall v_X: (s_instance(v_X, s_Object) \Rightarrow (s_attribute(v_X, s_Living) \Rightarrow s_instance(v_X, s_Organism)))$ fof(local₃, axiom)

s__instance(s__Organism12₁, s__Organism) fof(prove_from_ALL, conjecture)

CSR085+7.p One simple rule

include('Axioms/CSR003+2.ax')

s__instance(s__Organism12₁, s__Object) fof(local₁, axiom)

s__attribute(s__Organism12₁, s__Living) fof(local₂, axiom)

$\forall v_X: (s_instance(v_X, s_Object) \Rightarrow (s_attribute(v_X, s_Living) \Rightarrow s_instance(v_X, s_Organism)))$ fof(local₃, axiom)

$\exists x_s_Organism12_1: s_instance(x_s_Organism12_1, s_Organism)$ fof(prove_from_ALL, conjecture)

CSR086+1.p Skolemization, multiple rules

include('Axioms/CSR003+0.ax')

include('Axioms/CSR003+3.ax')

s__instance(s__Arc13₁, s__GraphLoop) fof(local₁, axiom)

$\exists v_NODE: s_links(v_NODE, v_NODE, s_Arc13_1)$ fof(prove_from_SUMO, conjecture)

CSR086+2.p Skolemization, multiple rules

include('Axioms/CSR003+1.ax')

include('Axioms/CSR003+4.ax')

s__instance(s__Arc13₁, s__GraphLoop) fof(local₁, axiom)

$\exists v_NODE: s_links(v_NODE, v_NODE, s_Arc13_1)$ fof(prove_from_SUMO_MILO, conjecture)

CSR086+3.p Skolemization, multiple rules

include('Axioms/CSR003+2.ax')

include('Axioms/CSR003+5.ax')

s__instance(s__Arc13₁, s__GraphLoop) fof(local₁, axiom)

$\exists v_NODE: s_links(v_NODE, v_NODE, s_Arc13_1)$ fof(prove_from_ALL, conjecture)

CSR086+4.p Skolemization, multiple rules

include('Axioms/CSR003+0.ax')

s__instance(s__Arc13₁, s__GraphLoop) fof(local₁, axiom)

$\exists v_NODE: s_links(v_NODE, v_NODE, s_Arc13_1)$ fof(prove_from_SUMO, conjecture)

CSR086+5.p Skolemization, multiple rules

include('Axioms/CSR003+1.ax')

s__instance(s__Arc13₁, s__GraphLoop) fof(local₁, axiom)

$\exists v_NODE: s_links(v_NODE, v_NODE, s_Arc13_1)$ fof(prove_from_SUMO_MILO, conjecture)

CSR086+6.p Skolemization, multiple rules

include('Axioms/CSR003+2.ax')

s__instance(s__Arc13₁, s__GraphLoop) fof(local₁, axiom)

$\exists v_NODE: s_links(v_NODE, v_NODE, s_Arc13_1)$ fof(prove_from_ALL, conjecture)

CSR087+1.p Just one rule that cannot be satisfied

include('Axioms/CSR003+0.ax')

include('Axioms/CSR003+3.ax')

```

s__instance(s__Atom141, s__Atom)    fof(local1, axiom)
s__instance(s__Nucleus141, s__AtomicNucleus)    fof(local2, axiom)
s__component(s__Nucleus141, s__Atom141)    fof(local3, axiom)
¬∃v_NUCLEUS: (s__instance(v_NUCLEUS, s__AtomicNucleus) and s__component(v_NUCLEUS, s__Atom141) and v_NUCLEUS
s__Nucleus141)    fof(prove_from_SUMO, conjecture)

```

CSR087+2.p Just one rule that cannot be satisfied

```

include('Axioms/CSR003+1.ax')
include('Axioms/CSR003+4.ax')
s__instance(s__Atom141, s__Atom)    fof(local1, axiom)
s__instance(s__Nucleus141, s__AtomicNucleus)    fof(local2, axiom)
s__component(s__Nucleus141, s__Atom141)    fof(local3, axiom)
¬∃v_NUCLEUS: (s__instance(v_NUCLEUS, s__AtomicNucleus) and s__component(v_NUCLEUS, s__Atom141) and v_NUCLEUS
s__Nucleus141)    fof(prove_from_SUMO_MILO, conjecture)

```

CSR087+3.p Just one rule that cannot be satisfied

```

include('Axioms/CSR003+2.ax')
include('Axioms/CSR003+5.ax')
s__instance(s__Atom141, s__Atom)    fof(local1, axiom)
s__instance(s__Nucleus141, s__AtomicNucleus)    fof(local2, axiom)
s__component(s__Nucleus141, s__Atom141)    fof(local3, axiom)
¬∃v_NUCLEUS: (s__instance(v_NUCLEUS, s__AtomicNucleus) and s__component(v_NUCLEUS, s__Atom141) and v_NUCLEUS
s__Nucleus141)    fof(prove_from_ALL, conjecture)

```

CSR087+4.p Just one rule that cannot be satisfied

```

include('Axioms/CSR003+0.ax')
s__instance(s__Atom141, s__Atom)    fof(local1, axiom)
s__instance(s__Nucleus141, s__AtomicNucleus)    fof(local2, axiom)
s__component(s__Nucleus141, s__Atom141)    fof(local3, axiom)
¬∃v_NUCLEUS: (s__instance(v_NUCLEUS, s__AtomicNucleus) and s__component(v_NUCLEUS, s__Atom141) and v_NUCLEUS
s__Nucleus141)    fof(prove_from_SUMO, conjecture)

```

CSR087+5.p Just one rule that cannot be satisfied

```

include('Axioms/CSR003+1.ax')
s__instance(s__Atom141, s__Atom)    fof(local1, axiom)
s__instance(s__Nucleus141, s__AtomicNucleus)    fof(local2, axiom)
s__component(s__Nucleus141, s__Atom141)    fof(local3, axiom)
¬∃v_NUCLEUS: (s__instance(v_NUCLEUS, s__AtomicNucleus) and s__component(v_NUCLEUS, s__Atom141) and v_NUCLEUS
s__Nucleus141)    fof(prove_from_SUMO_MILO, conjecture)

```

CSR087+6.p Just one rule that cannot be satisfied

```

include('Axioms/CSR003+2.ax')
s__instance(s__Atom141, s__Atom)    fof(local1, axiom)
s__instance(s__Nucleus141, s__AtomicNucleus)    fof(local2, axiom)
s__component(s__Nucleus141, s__Atom141)    fof(local3, axiom)
¬∃v_NUCLEUS: (s__instance(v_NUCLEUS, s__AtomicNucleus) and s__component(v_NUCLEUS, s__Atom141) and v_NUCLEUS
s__Nucleus141)    fof(prove_from_ALL, conjecture)

```

CSR088+1.p Overlapping and meeting time

```

include('Axioms/CSR003+0.ax')
include('Axioms/CSR003+3.ax')
s__instance(s__Time151, s__TimeInterval)    fof(local1, axiom)
s__instance(s__Time152, s__TimeInterval)    fof(local2, axiom)
s__meetsTemporally(s__Time151, s__Time152)    fof(local3, axiom)
¬s__overlapsTemporally(s__Time151, s__Time152)    fof(prove_from_SUMO, conjecture)

```

CSR088+2.p Overlapping and meeting time

```

include('Axioms/CSR003+1.ax')
include('Axioms/CSR003+4.ax')
s__instance(s__Time151, s__TimeInterval)    fof(local1, axiom)
s__instance(s__Time152, s__TimeInterval)    fof(local2, axiom)
s__meetsTemporally(s__Time151, s__Time152)    fof(local3, axiom)
¬s__overlapsTemporally(s__Time151, s__Time152)    fof(prove_from_SUMO_MILO, conjecture)

```

CSR088+3.p Overlapping and meeting time

```
include('Axioms/CSR003+2.ax')
include('Axioms/CSR003+5.ax')
s__instance(s__Time151, s__TimeInterval)    fof(local1, axiom)
s__instance(s__Time152, s__TimeInterval)    fof(local2, axiom)
s__meetsTemporally(s__Time151, s__Time152)  fof(local3, axiom)
¬s__overlapsTemporally(s__Time151, s__Time152)  fof(prove_from_ALL, conjecture)
```

CSR088+4.p Overlapping and meeting time

```
include('Axioms/CSR003+0.ax')
s__instance(s__Time151, s__TimeInterval)    fof(local1, axiom)
s__instance(s__Time152, s__TimeInterval)    fof(local2, axiom)
s__meetsTemporally(s__Time151, s__Time152)  fof(local3, axiom)
¬s__overlapsTemporally(s__Time151, s__Time152)  fof(prove_from_SUMO, conjecture)
```

CSR088+5.p Overlapping and meeting time

```
include('Axioms/CSR003+1.ax')
s__instance(s__Time151, s__TimeInterval)    fof(local1, axiom)
s__instance(s__Time152, s__TimeInterval)    fof(local2, axiom)
s__meetsTemporally(s__Time151, s__Time152)  fof(local3, axiom)
¬s__overlapsTemporally(s__Time151, s__Time152)  fof(prove_from_SUMO_MILO, conjecture)
```

CSR088+6.p Overlapping and meeting time

```
include('Axioms/CSR003+2.ax')
s__instance(s__Time151, s__TimeInterval)    fof(local1, axiom)
s__instance(s__Time152, s__TimeInterval)    fof(local2, axiom)
s__meetsTemporally(s__Time151, s__Time152)  fof(local3, axiom)
¬s__overlapsTemporally(s__Time151, s__Time152)  fof(prove_from_ALL, conjecture)
```

CSR088+7.p Overlapping and meeting time

```
include('Axioms/CSR003+2.ax')
s__instance(s__Time151, s__TimeInterval)    fof(local1, axiom)
s__instance(s__Time152, s__TimeInterval)    fof(local2, axiom)
s__meetsTemporally(s__Time151, s__Time152)  fof(local3, axiom)
∃x_s__Time151, x_s__Time152: ¬s__overlapsTemporally(x_s__Time151, x_s__Time152)  fof(prove_from_ALL, conjecture)
```

CSR089+1.p Overlapping and meeting space

```
include('Axioms/CSR003+0.ax')
include('Axioms/CSR003+3.ax')
s__instance(s__Object161, s__EngineeringConnection)  fof(local1, axiom)
s__instance(s__Object162, s__EngineeringComponent)  fof(local2, axiom)
s__instance(s__Object163, s__EngineeringComponent)  fof(local3, axiom)
s__connectsEngineeringComponents(s__Object161, s__Object162, s__Object163)  fof(local4, axiom)
¬s__overlapsSpatially(s__Object162, s__Object163)  fof(local5, axiom)
s__meetsSpatially(s__Object162, s__Object163)  fof(prove_from_SUMO, conjecture)
```

CSR089+2.p Overlapping and meeting space

```
include('Axioms/CSR003+1.ax')
include('Axioms/CSR003+4.ax')
s__instance(s__Object161, s__EngineeringConnection)  fof(local1, axiom)
s__instance(s__Object162, s__EngineeringComponent)  fof(local2, axiom)
s__instance(s__Object163, s__EngineeringComponent)  fof(local3, axiom)
s__connectsEngineeringComponents(s__Object161, s__Object162, s__Object163)  fof(local4, axiom)
¬s__overlapsSpatially(s__Object162, s__Object163)  fof(local5, axiom)
s__meetsSpatially(s__Object162, s__Object163)  fof(prove_from_SUMO_MILO, conjecture)
```

CSR089+3.p Overlapping and meeting space

```
include('Axioms/CSR003+2.ax')
include('Axioms/CSR003+5.ax')
s__instance(s__Object161, s__EngineeringConnection)  fof(local1, axiom)
s__instance(s__Object162, s__EngineeringComponent)  fof(local2, axiom)
s__instance(s__Object163, s__EngineeringComponent)  fof(local3, axiom)
s__connectsEngineeringComponents(s__Object161, s__Object162, s__Object163)  fof(local4, axiom)
```

\neg s__overlapsSpatially(s__Object16₂,s__Object16₃) fof(local₅, axiom)
s__meetsSpatially(s__Object16₂,s__Object16₃) fof(prove_from_ALL, conjecture)

CSR089+4.p Overlapping and meeting space

include('Axioms/CSR003+0.ax')
s__instance(s__Object16₁,s__EngineeringConnection) fof(local₁, axiom)
s__instance(s__Object16₂,s__EngineeringComponent) fof(local₂, axiom)
s__instance(s__Object16₃,s__EngineeringComponent) fof(local₃, axiom)
s__connectsEngineeringComponents(s__Object16₁,s__Object16₂,s__Object16₃) fof(local₄, axiom)
 \neg s__overlapsSpatially(s__Object16₂,s__Object16₃) fof(local₅, axiom)
s__meetsSpatially(s__Object16₂,s__Object16₃) fof(prove_from_SUMO, conjecture)

CSR089+5.p Overlapping and meeting space

include('Axioms/CSR003+1.ax')
s__instance(s__Object16₁,s__EngineeringConnection) fof(local₁, axiom)
s__instance(s__Object16₂,s__EngineeringComponent) fof(local₂, axiom)
s__instance(s__Object16₃,s__EngineeringComponent) fof(local₃, axiom)
s__connectsEngineeringComponents(s__Object16₁,s__Object16₂,s__Object16₃) fof(local₄, axiom)
 \neg s__overlapsSpatially(s__Object16₂,s__Object16₃) fof(local₅, axiom)
s__meetsSpatially(s__Object16₂,s__Object16₃) fof(prove_from_SUMO_MILO, conjecture)

CSR089+6.p Overlapping and meeting space

include('Axioms/CSR003+2.ax')
s__instance(s__Object16₁,s__EngineeringConnection) fof(local₁, axiom)
s__instance(s__Object16₂,s__EngineeringComponent) fof(local₂, axiom)
s__instance(s__Object16₃,s__EngineeringComponent) fof(local₃, axiom)
s__connectsEngineeringComponents(s__Object16₁,s__Object16₂,s__Object16₃) fof(local₄, axiom)
 \neg s__overlapsSpatially(s__Object16₂,s__Object16₃) fof(local₅, axiom)
s__meetsSpatially(s__Object16₂,s__Object16₃) fof(prove_from_ALL, conjecture)

CSR089+7.p Overlapping and meeting space

include('Axioms/CSR003+2.ax')
s__instance(s__Object16₁,s__EngineeringConnection) fof(local₁, axiom)
s__instance(s__Object16₂,s__EngineeringComponent) fof(local₂, axiom)
s__instance(s__Object16₃,s__EngineeringComponent) fof(local₃, axiom)
s__connectsEngineeringComponents(s__Object16₁,s__Object16₂,s__Object16₃) fof(local₄, axiom)
 \neg s__overlapsSpatially(s__Object16₂,s__Object16₃) fof(local₅, axiom)
 \exists x_s__Object16₂,x_s__Object16₃:s__meetsSpatially(x_s__Object16₂,x_s__Object16₃) fof(prove_from_ALL, conjecture)

CSR090+1.p Pieces of time

include('Axioms/CSR003+0.ax')
include('Axioms/CSR003+3.ax')
s__instance(s__Time17₁,s__TimeInterval) fof(local₁, axiom)
s__instance(s__Time17₂,s__TimeInterval) fof(local₂, axiom)
s__instance(s__Time17₃,s__TimeInterval) fof(local₃, axiom)
s__temporalPart(s__Time17₁,s__Time17₂) fof(local₄, axiom)
s__temporalPart(s__Time17₂,s__Time17₃) fof(local₅, axiom)
s__temporalPart(s__Time17₁,s__Time17₃) fof(prove_from_SUMO, conjecture)

CSR090+2.p Pieces of time

include('Axioms/CSR003+1.ax')
include('Axioms/CSR003+4.ax')
s__instance(s__Time17₁,s__TimeInterval) fof(local₁, axiom)
s__instance(s__Time17₂,s__TimeInterval) fof(local₂, axiom)
s__instance(s__Time17₃,s__TimeInterval) fof(local₃, axiom)
s__temporalPart(s__Time17₁,s__Time17₂) fof(local₄, axiom)
s__temporalPart(s__Time17₂,s__Time17₃) fof(local₅, axiom)
s__temporalPart(s__Time17₁,s__Time17₃) fof(prove_from_SUMO_MILO, conjecture)

CSR090+3.p Pieces of time

include('Axioms/CSR003+2.ax')
include('Axioms/CSR003+5.ax')
s__instance(s__Time17₁,s__TimeInterval) fof(local₁, axiom)

`s__instance(s__Time172, s__TimeInterval)` `fof(local2, axiom)`
`s__instance(s__Time173, s__TimeInterval)` `fof(local3, axiom)`
`s__temporalPart(s__Time171, s__Time172)` `fof(local4, axiom)`
`s__temporalPart(s__Time172, s__Time173)` `fof(local5, axiom)`
`s__temporalPart(s__Time171, s__Time173)` `fof(prove_from_ALL, conjecture)`

CSR090+4.p Pieces of time

`include('Axioms/CSR003+0.ax')`
`s__instance(s__Time171, s__TimeInterval)` `fof(local1, axiom)`
`s__instance(s__Time172, s__TimeInterval)` `fof(local2, axiom)`
`s__instance(s__Time173, s__TimeInterval)` `fof(local3, axiom)`
`s__temporalPart(s__Time171, s__Time172)` `fof(local4, axiom)`
`s__temporalPart(s__Time172, s__Time173)` `fof(local5, axiom)`
`s__temporalPart(s__Time171, s__Time173)` `fof(prove_from_SUMO, conjecture)`

CSR090+5.p Pieces of time

`include('Axioms/CSR003+1.ax')`
`s__instance(s__Time171, s__TimeInterval)` `fof(local1, axiom)`
`s__instance(s__Time172, s__TimeInterval)` `fof(local2, axiom)`
`s__instance(s__Time173, s__TimeInterval)` `fof(local3, axiom)`
`s__temporalPart(s__Time171, s__Time172)` `fof(local4, axiom)`
`s__temporalPart(s__Time172, s__Time173)` `fof(local5, axiom)`
`s__temporalPart(s__Time171, s__Time173)` `fof(prove_from_SUMO_MILO, conjecture)`

CSR090+6.p Pieces of time

`include('Axioms/CSR003+2.ax')`
`s__instance(s__Time171, s__TimeInterval)` `fof(local1, axiom)`
`s__instance(s__Time172, s__TimeInterval)` `fof(local2, axiom)`
`s__instance(s__Time173, s__TimeInterval)` `fof(local3, axiom)`
`s__temporalPart(s__Time171, s__Time172)` `fof(local4, axiom)`
`s__temporalPart(s__Time172, s__Time173)` `fof(local5, axiom)`
`s__temporalPart(s__Time171, s__Time173)` `fof(prove_from_ALL, conjecture)`

CSR091+1.p Therapeutic process

`include('Axioms/CSR003+0.ax')`
`include('Axioms/CSR003+3.ax')`
`s__instance(s__Proc181, s__TherapeuticProcess)` `fof(local1, axiom)`
`s__instance(s__Bio181, s__OrganicObject)` `fof(local2, axiom)`
`s__patient(s__Proc181, s__Bio181)` `fof(local3, axiom)`
`¬s__instance(s__Bio181, s__Organism)` `fof(local4, axiom)`
`∃v_X: (s__instance(v_X, s__Organism) and s__part(s__Bio181, v_X))` `fof(prove_from_SUMO, conjecture)`

CSR091+2.p Therapeutic process

`include('Axioms/CSR003+1.ax')`
`include('Axioms/CSR003+4.ax')`
`s__instance(s__Proc181, s__TherapeuticProcess)` `fof(local1, axiom)`
`s__instance(s__Bio181, s__OrganicObject)` `fof(local2, axiom)`
`s__patient(s__Proc181, s__Bio181)` `fof(local3, axiom)`
`¬s__instance(s__Bio181, s__Organism)` `fof(local4, axiom)`
`∃v_X: (s__instance(v_X, s__Organism) and s__part(s__Bio181, v_X))` `fof(prove_from_SUMO_MILO, conjecture)`

CSR091+3.p Therapeutic process

`include('Axioms/CSR003+2.ax')`
`include('Axioms/CSR003+5.ax')`
`s__instance(s__Proc181, s__TherapeuticProcess)` `fof(local1, axiom)`
`s__instance(s__Bio181, s__OrganicObject)` `fof(local2, axiom)`
`s__patient(s__Proc181, s__Bio181)` `fof(local3, axiom)`
`¬s__instance(s__Bio181, s__Organism)` `fof(local4, axiom)`
`∃v_X: (s__instance(v_X, s__Organism) and s__part(s__Bio181, v_X))` `fof(prove_from_ALL, conjecture)`

CSR091+4.p Therapeutic process

`include('Axioms/CSR003+0.ax')`
`s__instance(s__Proc181, s__TherapeuticProcess)` `fof(local1, axiom)`

$s_instance(s_Bio18_1, s_OrganicObject) \quad fof(local_2, axiom)$
 $s_patient(s_Proc18_1, s_Bio18_1) \quad fof(local_3, axiom)$
 $\neg s_instance(s_Bio18_1, s_Organism) \quad fof(local_4, axiom)$
 $\exists v_X: (s_instance(v_X, s_Organism) \text{ and } s_part(s_Bio18_1, v_X)) \quad fof(prove_from_SUMO, conjecture)$

CSR091+5.p Therapeutic process

$include('Axioms/CSR003+1.ax')$
 $s_instance(s_Proc18_1, s_TherapeuticProcess) \quad fof(local_1, axiom)$
 $s_instance(s_Bio18_1, s_OrganicObject) \quad fof(local_2, axiom)$
 $s_patient(s_Proc18_1, s_Bio18_1) \quad fof(local_3, axiom)$
 $\neg s_instance(s_Bio18_1, s_Organism) \quad fof(local_4, axiom)$
 $\exists v_X: (s_instance(v_X, s_Organism) \text{ and } s_part(s_Bio18_1, v_X)) \quad fof(prove_from_SUMO_MILO, conjecture)$

CSR091+6.p Therapeutic process

$include('Axioms/CSR003+2.ax')$
 $s_instance(s_Proc18_1, s_TherapeuticProcess) \quad fof(local_1, axiom)$
 $s_instance(s_Bio18_1, s_OrganicObject) \quad fof(local_2, axiom)$
 $s_patient(s_Proc18_1, s_Bio18_1) \quad fof(local_3, axiom)$
 $\neg s_instance(s_Bio18_1, s_Organism) \quad fof(local_4, axiom)$
 $\exists v_X: (s_instance(v_X, s_Organism) \text{ and } s_part(s_Bio18_1, v_X)) \quad fof(prove_from_ALL, conjecture)$

CSR092+1.p Ancestry

$include('Axioms/CSR003+0.ax')$
 $include('Axioms/CSR003+3.ax')$
 $s_instance(s_Man22_1, s_Man) \quad fof(local_1, axiom)$
 $s_instance(s_Ancestor22_1, s_Human) \quad fof(local_2, axiom)$
 $s_son(s_Man22_1, s_Ancestor22_1) \quad fof(local_3, axiom)$
 $\exists v_X: (s_ancestor(s_Man22_1, v_X) \text{ and } v_X = s_Ancestor22_1) \quad fof(prove_from_SUMO, conjecture)$

CSR092+2.p Ancestry

$include('Axioms/CSR003+1.ax')$
 $include('Axioms/CSR003+4.ax')$
 $s_instance(s_Man22_1, s_Man) \quad fof(local_1, axiom)$
 $s_instance(s_Ancestor22_1, s_Human) \quad fof(local_2, axiom)$
 $s_son(s_Man22_1, s_Ancestor22_1) \quad fof(local_3, axiom)$
 $\exists v_X: (s_ancestor(s_Man22_1, v_X) \text{ and } v_X = s_Ancestor22_1) \quad fof(prove_from_SUMO_MILO, conjecture)$

CSR092+3.p Ancestry

$include('Axioms/CSR003+2.ax')$
 $include('Axioms/CSR003+5.ax')$
 $s_instance(s_Man22_1, s_Man) \quad fof(local_1, axiom)$
 $s_instance(s_Ancestor22_1, s_Human) \quad fof(local_2, axiom)$
 $s_son(s_Man22_1, s_Ancestor22_1) \quad fof(local_3, axiom)$
 $\exists v_X: (s_ancestor(s_Man22_1, v_X) \text{ and } v_X = s_Ancestor22_1) \quad fof(prove_from_ALL, conjecture)$

CSR092+4.p Ancestry

$include('Axioms/CSR003+0.ax')$
 $s_instance(s_Man22_1, s_Man) \quad fof(local_1, axiom)$
 $s_instance(s_Ancestor22_1, s_Human) \quad fof(local_2, axiom)$
 $s_son(s_Man22_1, s_Ancestor22_1) \quad fof(local_3, axiom)$
 $\exists v_X: (s_ancestor(s_Man22_1, v_X) \text{ and } v_X = s_Ancestor22_1) \quad fof(prove_from_SUMO, conjecture)$

CSR092+5.p Ancestry

$include('Axioms/CSR003+1.ax')$
 $s_instance(s_Man22_1, s_Man) \quad fof(local_1, axiom)$
 $s_instance(s_Ancestor22_1, s_Human) \quad fof(local_2, axiom)$
 $s_son(s_Man22_1, s_Ancestor22_1) \quad fof(local_3, axiom)$
 $\exists v_X: (s_ancestor(s_Man22_1, v_X) \text{ and } v_X = s_Ancestor22_1) \quad fof(prove_from_SUMO_MILO, conjecture)$

CSR092+6.p Ancestry

$include('Axioms/CSR003+2.ax')$
 $s_instance(s_Man22_1, s_Man) \quad fof(local_1, axiom)$
 $s_instance(s_Ancestor22_1, s_Human) \quad fof(local_2, axiom)$
 $s_son(s_Man22_1, s_Ancestor22_1) \quad fof(local_3, axiom)$

$\exists v_X: (s_ancestor(s_Man22_1, v_X) \text{ and } v_X = s_Ancestor22_1)$ `fof(prove_from_ALL, conjecture)`

CSR093+1.p Distant ancestry

`include('Axioms/CSR003+0.ax')`

`include('Axioms/CSR003+3.ax')`

`s__instance(s__Human23_1, s__Human)` `fof(local_1, axiom)`

`s__instance(s__Human23_2, s__Human)` `fof(local_2, axiom)`

`s__instance(s__Human23_3, s__Human)` `fof(local_3, axiom)`

`s__instance(s__Human23_4, s__Human)` `fof(local_4, axiom)`

`s__instance(s__Human23_5, s__Human)` `fof(local_5, axiom)`

`s__instance(s__Human23_6, s__Human)` `fof(local_6, axiom)`

`s__instance(s__Human23_7, s__Human)` `fof(local_7, axiom)`

`s__instance(s__Human23_8, s__Human)` `fof(local_8, axiom)`

`s__instance(s__Human23_9, s__Human)` `fof(local_9, axiom)`

`s__instance(s__Human23_10, s__Human)` `fof(local_10, axiom)`

`s__instance(s__Human23_11, s__Human)` `fof(local_11, axiom)`

`s__instance(s__Human23_12, s__Human)` `fof(local_12, axiom)`

`s__instance(s__Human23_13, s__Human)` `fof(local_13, axiom)`

`s__instance(s__Human23_14, s__Human)` `fof(local_14, axiom)`

`s__instance(s__Human23_15, s__Human)` `fof(local_15, axiom)`

`s__instance(s__Human23_16, s__Human)` `fof(local_16, axiom)`

`s__ancestor(s__Human23_1, s__Human23_2)` `fof(local_17, axiom)`

`s__ancestor(s__Human23_2, s__Human23_3)` `fof(local_18, axiom)`

`s__ancestor(s__Human23_3, s__Human23_4)` `fof(local_19, axiom)`

`s__ancestor(s__Human23_4, s__Human23_5)` `fof(local_20, axiom)`

`s__ancestor(s__Human23_5, s__Human23_6)` `fof(local_21, axiom)`

`s__ancestor(s__Human23_6, s__Human23_7)` `fof(local_22, axiom)`

`s__ancestor(s__Human23_7, s__Human23_8)` `fof(local_23, axiom)`

`s__ancestor(s__Human23_8, s__Human23_9)` `fof(local_24, axiom)`

`s__ancestor(s__Human23_9, s__Human23_10)` `fof(local_25, axiom)`

`s__ancestor(s__Human23_10, s__Human23_11)` `fof(local_26, axiom)`

`s__ancestor(s__Human23_11, s__Human23_12)` `fof(local_27, axiom)`

`s__ancestor(s__Human23_12, s__Human23_13)` `fof(local_28, axiom)`

`s__ancestor(s__Human23_13, s__Human23_14)` `fof(local_29, axiom)`

`s__ancestor(s__Human23_14, s__Human23_15)` `fof(local_30, axiom)`

`s__ancestor(s__Human23_14, s__Human23_16)` `fof(local_31, axiom)`

`s__ancestor(s__Human23_1, s__Human23_15) and s__ancestor(s__Human23_1, s__Human23_16)` `fof(prove_from_SUMO, conjecture)`

CSR093+2.p Distant ancestry

`include('Axioms/CSR003+1.ax')`

`include('Axioms/CSR003+4.ax')`

`s__instance(s__Human23_1, s__Human)` `fof(local_1, axiom)`

`s__instance(s__Human23_2, s__Human)` `fof(local_2, axiom)`

`s__instance(s__Human23_3, s__Human)` `fof(local_3, axiom)`

`s__instance(s__Human23_4, s__Human)` `fof(local_4, axiom)`

`s__instance(s__Human23_5, s__Human)` `fof(local_5, axiom)`

`s__instance(s__Human23_6, s__Human)` `fof(local_6, axiom)`

`s__instance(s__Human23_7, s__Human)` `fof(local_7, axiom)`

`s__instance(s__Human23_8, s__Human)` `fof(local_8, axiom)`

`s__instance(s__Human23_9, s__Human)` `fof(local_9, axiom)`

`s__instance(s__Human23_10, s__Human)` `fof(local_10, axiom)`

`s__instance(s__Human23_11, s__Human)` `fof(local_11, axiom)`

`s__instance(s__Human23_12, s__Human)` `fof(local_12, axiom)`

`s__instance(s__Human23_13, s__Human)` `fof(local_13, axiom)`

`s__instance(s__Human23_14, s__Human)` `fof(local_14, axiom)`

`s__instance(s__Human23_15, s__Human)` `fof(local_15, axiom)`

`s__instance(s__Human23_16, s__Human)` `fof(local_16, axiom)`

`s__ancestor(s__Human23_1, s__Human23_2)` `fof(local_17, axiom)`

`s__ancestor(s__Human23_2, s__Human23_3)` `fof(local_18, axiom)`

`s__ancestor(s__Human23_3, s__Human23_4)` `fof(local_19, axiom)`

```

s_ancestor(s_Human234, s_Human235)    fof(local20, axiom)
s_ancestor(s_Human235, s_Human236)    fof(local21, axiom)
s_ancestor(s_Human236, s_Human237)    fof(local22, axiom)
s_ancestor(s_Human237, s_Human238)    fof(local23, axiom)
s_ancestor(s_Human238, s_Human239)    fof(local24, axiom)
s_ancestor(s_Human239, s_Human2310)   fof(local25, axiom)
s_ancestor(s_Human2310, s_Human2311)  fof(local26, axiom)
s_ancestor(s_Human2311, s_Human2312)  fof(local27, axiom)
s_ancestor(s_Human2312, s_Human2313)  fof(local28, axiom)
s_ancestor(s_Human2313, s_Human2314)  fof(local29, axiom)
s_ancestor(s_Human2314, s_Human2315)  fof(local30, axiom)
s_ancestor(s_Human2314, s_Human2316)  fof(local31, axiom)
s_ancestor(s_Human231, s_Human2315) and s_ancestor(s_Human231, s_Human2316)    fof(prove_from_SUMO_MILO, conjecture)

```

CSR093+3.p Distant ancestry

```
include('Axioms/CSR003+2.ax')
```

```
include('Axioms/CSR003+5.ax')
```

```

s_instance(s_Human231, s_Human)      fof(local1, axiom)
s_instance(s_Human232, s_Human)      fof(local2, axiom)
s_instance(s_Human233, s_Human)      fof(local3, axiom)
s_instance(s_Human234, s_Human)      fof(local4, axiom)
s_instance(s_Human235, s_Human)      fof(local5, axiom)
s_instance(s_Human236, s_Human)      fof(local6, axiom)
s_instance(s_Human237, s_Human)      fof(local7, axiom)
s_instance(s_Human238, s_Human)      fof(local8, axiom)
s_instance(s_Human239, s_Human)      fof(local9, axiom)
s_instance(s_Human2310, s_Human)     fof(local10, axiom)
s_instance(s_Human2311, s_Human)     fof(local11, axiom)
s_instance(s_Human2312, s_Human)     fof(local12, axiom)
s_instance(s_Human2313, s_Human)     fof(local13, axiom)
s_instance(s_Human2314, s_Human)     fof(local14, axiom)
s_instance(s_Human2315, s_Human)     fof(local15, axiom)
s_instance(s_Human2316, s_Human)     fof(local16, axiom)
s_ancestor(s_Human231, s_Human232)   fof(local17, axiom)
s_ancestor(s_Human232, s_Human233)   fof(local18, axiom)
s_ancestor(s_Human233, s_Human234)   fof(local19, axiom)
s_ancestor(s_Human234, s_Human235)   fof(local20, axiom)
s_ancestor(s_Human235, s_Human236)   fof(local21, axiom)
s_ancestor(s_Human236, s_Human237)   fof(local22, axiom)
s_ancestor(s_Human237, s_Human238)   fof(local23, axiom)
s_ancestor(s_Human238, s_Human239)   fof(local24, axiom)
s_ancestor(s_Human239, s_Human2310)  fof(local25, axiom)
s_ancestor(s_Human2310, s_Human2311) fof(local26, axiom)
s_ancestor(s_Human2311, s_Human2312) fof(local27, axiom)
s_ancestor(s_Human2312, s_Human2313) fof(local28, axiom)
s_ancestor(s_Human2313, s_Human2314) fof(local29, axiom)
s_ancestor(s_Human2314, s_Human2315) fof(local30, axiom)
s_ancestor(s_Human2314, s_Human2316) fof(local31, axiom)
s_ancestor(s_Human231, s_Human2315) and s_ancestor(s_Human231, s_Human2316)    fof(prove_from_ALL, conjecture)

```

CSR093+4.p Distant ancestry

```
include('Axioms/CSR003+0.ax')
```

```

s_instance(s_Human231, s_Human)      fof(local1, axiom)
s_instance(s_Human232, s_Human)      fof(local2, axiom)
s_instance(s_Human233, s_Human)      fof(local3, axiom)
s_instance(s_Human234, s_Human)      fof(local4, axiom)
s_instance(s_Human235, s_Human)      fof(local5, axiom)
s_instance(s_Human236, s_Human)      fof(local6, axiom)
s_instance(s_Human237, s_Human)      fof(local7, axiom)
s_instance(s_Human238, s_Human)      fof(local8, axiom)

```

```

s__instance(s__Human239, s__Human)      fof(local9, axiom)
s__instance(s__Human2310, s__Human)     fof(local10, axiom)
s__instance(s__Human2311, s__Human)     fof(local11, axiom)
s__instance(s__Human2312, s__Human)     fof(local12, axiom)
s__instance(s__Human2313, s__Human)     fof(local13, axiom)
s__instance(s__Human2314, s__Human)     fof(local14, axiom)
s__instance(s__Human2315, s__Human)     fof(local15, axiom)
s__instance(s__Human2316, s__Human)     fof(local16, axiom)
s__ancestor(s__Human231, s__Human232)  fof(local17, axiom)
s__ancestor(s__Human232, s__Human233)  fof(local18, axiom)
s__ancestor(s__Human233, s__Human234)  fof(local19, axiom)
s__ancestor(s__Human234, s__Human235)  fof(local20, axiom)
s__ancestor(s__Human235, s__Human236)  fof(local21, axiom)
s__ancestor(s__Human236, s__Human237)  fof(local22, axiom)
s__ancestor(s__Human237, s__Human238)  fof(local23, axiom)
s__ancestor(s__Human238, s__Human239)  fof(local24, axiom)
s__ancestor(s__Human239, s__Human2310) fof(local25, axiom)
s__ancestor(s__Human2310, s__Human2311) fof(local26, axiom)
s__ancestor(s__Human2311, s__Human2312) fof(local27, axiom)
s__ancestor(s__Human2312, s__Human2313) fof(local28, axiom)
s__ancestor(s__Human2313, s__Human2314) fof(local29, axiom)
s__ancestor(s__Human2314, s__Human2315) fof(local30, axiom)
s__ancestor(s__Human2314, s__Human2316) fof(local31, axiom)
s__ancestor(s__Human231, s__Human2315) and s__ancestor(s__Human231, s__Human2316) fof(prove_from_SUMO, conjecture)

```

CSR093+5.p Distant ancestry

```

include('Axioms/CSR003+1.ax')
s__instance(s__Human231, s__Human)      fof(local1, axiom)
s__instance(s__Human232, s__Human)     fof(local2, axiom)
s__instance(s__Human233, s__Human)     fof(local3, axiom)
s__instance(s__Human234, s__Human)     fof(local4, axiom)
s__instance(s__Human235, s__Human)     fof(local5, axiom)
s__instance(s__Human236, s__Human)     fof(local6, axiom)
s__instance(s__Human237, s__Human)     fof(local7, axiom)
s__instance(s__Human238, s__Human)     fof(local8, axiom)
s__instance(s__Human239, s__Human)     fof(local9, axiom)
s__instance(s__Human2310, s__Human)    fof(local10, axiom)
s__instance(s__Human2311, s__Human)    fof(local11, axiom)
s__instance(s__Human2312, s__Human)    fof(local12, axiom)
s__instance(s__Human2313, s__Human)    fof(local13, axiom)
s__instance(s__Human2314, s__Human)    fof(local14, axiom)
s__instance(s__Human2315, s__Human)    fof(local15, axiom)
s__instance(s__Human2316, s__Human)    fof(local16, axiom)
s__ancestor(s__Human231, s__Human232)  fof(local17, axiom)
s__ancestor(s__Human232, s__Human233)  fof(local18, axiom)
s__ancestor(s__Human233, s__Human234)  fof(local19, axiom)
s__ancestor(s__Human234, s__Human235)  fof(local20, axiom)
s__ancestor(s__Human235, s__Human236)  fof(local21, axiom)
s__ancestor(s__Human236, s__Human237)  fof(local22, axiom)
s__ancestor(s__Human237, s__Human238)  fof(local23, axiom)
s__ancestor(s__Human238, s__Human239)  fof(local24, axiom)
s__ancestor(s__Human239, s__Human2310) fof(local25, axiom)
s__ancestor(s__Human2310, s__Human2311) fof(local26, axiom)
s__ancestor(s__Human2311, s__Human2312) fof(local27, axiom)
s__ancestor(s__Human2312, s__Human2313) fof(local28, axiom)
s__ancestor(s__Human2313, s__Human2314) fof(local29, axiom)
s__ancestor(s__Human2314, s__Human2315) fof(local30, axiom)
s__ancestor(s__Human2314, s__Human2316) fof(local31, axiom)
s__ancestor(s__Human231, s__Human2315) and s__ancestor(s__Human231, s__Human2316) fof(prove_from_SUMO_MILO, conjecture)

```

CSR093+6.p Distant ancestry

include('Axioms/CSR003+2.ax')

```

s__instance(s__Human231, s__Human) fof(local1, axiom)
s__instance(s__Human232, s__Human) fof(local2, axiom)
s__instance(s__Human233, s__Human) fof(local3, axiom)
s__instance(s__Human234, s__Human) fof(local4, axiom)
s__instance(s__Human235, s__Human) fof(local5, axiom)
s__instance(s__Human236, s__Human) fof(local6, axiom)
s__instance(s__Human237, s__Human) fof(local7, axiom)
s__instance(s__Human238, s__Human) fof(local8, axiom)
s__instance(s__Human239, s__Human) fof(local9, axiom)
s__instance(s__Human2310, s__Human) fof(local10, axiom)
s__instance(s__Human2311, s__Human) fof(local11, axiom)
s__instance(s__Human2312, s__Human) fof(local12, axiom)
s__instance(s__Human2313, s__Human) fof(local13, axiom)
s__instance(s__Human2314, s__Human) fof(local14, axiom)
s__instance(s__Human2315, s__Human) fof(local15, axiom)
s__instance(s__Human2316, s__Human) fof(local16, axiom)
s__ancestor(s__Human231, s__Human232) fof(local17, axiom)
s__ancestor(s__Human232, s__Human233) fof(local18, axiom)
s__ancestor(s__Human233, s__Human234) fof(local19, axiom)
s__ancestor(s__Human234, s__Human235) fof(local20, axiom)
s__ancestor(s__Human235, s__Human236) fof(local21, axiom)
s__ancestor(s__Human236, s__Human237) fof(local22, axiom)
s__ancestor(s__Human237, s__Human238) fof(local23, axiom)
s__ancestor(s__Human238, s__Human239) fof(local24, axiom)
s__ancestor(s__Human239, s__Human2310) fof(local25, axiom)
s__ancestor(s__Human2310, s__Human2311) fof(local26, axiom)
s__ancestor(s__Human2311, s__Human2312) fof(local27, axiom)
s__ancestor(s__Human2312, s__Human2313) fof(local28, axiom)
s__ancestor(s__Human2313, s__Human2314) fof(local29, axiom)
s__ancestor(s__Human2314, s__Human2315) fof(local30, axiom)
s__ancestor(s__Human2314, s__Human2316) fof(local31, axiom)
s__ancestor(s__Human231, s__Human2315) and s__ancestor(s__Human231, s__Human2316) fof(prove_from_ALL, conjecture)

```

CSR093+7.p Distant ancestry

include('Axioms/CSR003+2.ax')

```

s__instance(s__Human231, s__Human) fof(local1, axiom)
s__instance(s__Human232, s__Human) fof(local2, axiom)
s__instance(s__Human233, s__Human) fof(local3, axiom)
s__instance(s__Human234, s__Human) fof(local4, axiom)
s__instance(s__Human235, s__Human) fof(local5, axiom)
s__instance(s__Human236, s__Human) fof(local6, axiom)
s__instance(s__Human237, s__Human) fof(local7, axiom)
s__instance(s__Human238, s__Human) fof(local8, axiom)
s__instance(s__Human239, s__Human) fof(local9, axiom)
s__instance(s__Human2310, s__Human) fof(local10, axiom)
s__instance(s__Human2311, s__Human) fof(local11, axiom)
s__instance(s__Human2312, s__Human) fof(local12, axiom)
s__instance(s__Human2313, s__Human) fof(local13, axiom)
s__instance(s__Human2314, s__Human) fof(local14, axiom)
s__instance(s__Human2315, s__Human) fof(local15, axiom)
s__instance(s__Human2316, s__Human) fof(local16, axiom)
s__ancestor(s__Human231, s__Human232) fof(local17, axiom)
s__ancestor(s__Human232, s__Human233) fof(local18, axiom)
s__ancestor(s__Human233, s__Human234) fof(local19, axiom)
s__ancestor(s__Human234, s__Human235) fof(local20, axiom)
s__ancestor(s__Human235, s__Human236) fof(local21, axiom)
s__ancestor(s__Human236, s__Human237) fof(local22, axiom)
s__ancestor(s__Human237, s__Human238) fof(local23, axiom)

```

```

s__ancestor(s__Human238, s__Human239)    fof(local24, axiom)
s__ancestor(s__Human239, s__Human2310)   fof(local25, axiom)
s__ancestor(s__Human2310, s__Human2311)  fof(local26, axiom)
s__ancestor(s__Human2311, s__Human2312)  fof(local27, axiom)
s__ancestor(s__Human2312, s__Human2313)  fof(local28, axiom)
s__ancestor(s__Human2313, s__Human2314)  fof(local29, axiom)
s__ancestor(s__Human2314, s__Human2315)  fof(local30, axiom)
s__ancestor(s__Human2314, s__Human2316)  fof(local31, axiom)
∃x_s__Human23_middle: (s__ancestor(s__Human231, x_s__Human23_middle) and s__ancestor(x_s__Human23_middle, s__Human2316))

```

CSR094+1.p Class subsumption

```

include('Axioms/CSR003+0.ax')
include('Axioms/CSR003+3.ax')
s__instance(s__Rover241, s__Canine)    fof(local1, axiom)
s__instance(s__Rover241, s__CorpuscularObject)  fof(prove_from_SUMO, conjecture)

```

CSR094+2.p Class subsumption

```

include('Axioms/CSR003+1.ax')
include('Axioms/CSR003+4.ax')
s__instance(s__Rover241, s__Canine)    fof(local1, axiom)
s__instance(s__Rover241, s__CorpuscularObject)  fof(prove_from_SUMO_MILO, conjecture)

```

CSR094+3.p Class subsumption

```

include('Axioms/CSR003+2.ax')
include('Axioms/CSR003+5.ax')
s__instance(s__Rover241, s__Canine)    fof(local1, axiom)
s__instance(s__Rover241, s__CorpuscularObject)  fof(prove_from_ALL, conjecture)

```

CSR094+4.p Class subsumption

```

include('Axioms/CSR003+0.ax')
s__instance(s__Rover241, s__Canine)    fof(local1, axiom)
s__instance(s__Rover241, s__CorpuscularObject)  fof(prove_from_SUMO, conjecture)

```

CSR094+5.p Class subsumption

```

include('Axioms/CSR003+1.ax')
s__instance(s__Rover241, s__Canine)    fof(local1, axiom)
s__instance(s__Rover241, s__CorpuscularObject)  fof(prove_from_SUMO_MILO, conjecture)

```

CSR094+6.p Class subsumption

```

include('Axioms/CSR003+2.ax')
s__instance(s__Rover241, s__Canine)    fof(local1, axiom)
s__instance(s__Rover241, s__CorpuscularObject)  fof(prove_from_ALL, conjecture)

```

CSR094+7.p Class subsumption

```

include('Axioms/CSR003+2.ax')
s__instance(s__Rover241, s__Canine)    fof(local1, axiom)
∃x_s__Rover241: s__instance(x_s__Rover241, s__CorpuscularObject)  fof(prove_from_ALL, conjecture)

```

CSR095+1.p Case elimination

```

include('Axioms/CSR003+0.ax')
include('Axioms/CSR003+3.ax')
s__instance(s__Organism251, s__Organism)  fof(local1, axiom)
¬s__instance(s__Organism251, s__Microorganism)  fof(local2, axiom)
¬s__instance(s__Organism251, s__Animal)    fof(local3, axiom)
s__instance(s__Organism251, s__Plant)    fof(prove_from_SUMO, conjecture)

```

CSR095+2.p Case elimination

```

include('Axioms/CSR003+1.ax')
include('Axioms/CSR003+4.ax')
s__instance(s__Organism251, s__Organism)  fof(local1, axiom)
¬s__instance(s__Organism251, s__Microorganism)  fof(local2, axiom)
¬s__instance(s__Organism251, s__Animal)    fof(local3, axiom)
s__instance(s__Organism251, s__Plant)    fof(prove_from_SUMO_MILO, conjecture)

```

CSR095+3.p Case elimination

```

include('Axioms/CSR003+2.ax')
include('Axioms/CSR003+5.ax')
s__instance(s__Organism25_1, s__Organism)    fof(local_1, axiom)
¬s__instance(s__Organism25_1, s__Microorganism)    fof(local_2, axiom)
¬s__instance(s__Organism25_1, s__Animal)    fof(local_3, axiom)
s__instance(s__Organism25_1, s__Plant)    fof(prove_from_ALL, conjecture)

```

CSR095+4.p Case elimination

```

include('Axioms/CSR003+0.ax')
s__instance(s__Organism25_1, s__Organism)    fof(local_1, axiom)
¬s__instance(s__Organism25_1, s__Microorganism)    fof(local_2, axiom)
¬s__instance(s__Organism25_1, s__Animal)    fof(local_3, axiom)
s__instance(s__Organism25_1, s__Plant)    fof(prove_from_SUMO, conjecture)

```

CSR095+5.p Case elimination

```

include('Axioms/CSR003+1.ax')
s__instance(s__Organism25_1, s__Organism)    fof(local_1, axiom)
¬s__instance(s__Organism25_1, s__Microorganism)    fof(local_2, axiom)
¬s__instance(s__Organism25_1, s__Animal)    fof(local_3, axiom)
s__instance(s__Organism25_1, s__Plant)    fof(prove_from_SUMO_MILO, conjecture)

```

CSR095+6.p Case elimination

```

include('Axioms/CSR003+2.ax')
s__instance(s__Organism25_1, s__Organism)    fof(local_1, axiom)
¬s__instance(s__Organism25_1, s__Microorganism)    fof(local_2, axiom)
¬s__instance(s__Organism25_1, s__Animal)    fof(local_3, axiom)
s__instance(s__Organism25_1, s__Plant)    fof(prove_from_ALL, conjecture)

```

CSR096+1.p Case elimination

```

include('Axioms/CSR003+0.ax')
include('Axioms/CSR003+3.ax')
s__instance(s__Planet26_1, s__Class)    fof(local_1, axiom)
s__subclass(s__Planet26_1, s__AstronomicalBody)    fof(local_2, axiom)
∀v_P: (s__instance(v_P, s__Object) ⇒ (s__instance(v_P, s__Planet26_1) ⇒ (s__attribute(v_P, s__Solid) or s__attribute(v_P, s__Gaseous))))
∀v_P: (s__instance(v_P, s__Object) ⇒ (s__instance(v_P, s__Planet26_1) ⇒ (s__attribute(v_P, s__Earthlike) or s__attribute(v_P, s__Gaseous))))
∀v_X: (s__instance(v_X, s__Object) ⇒ ((s__instance(v_X, s__Planet26_1) and s__attribute(v_X, s__Gaseous)) ⇒ ¬s__attribute(v_X, s__Solid)))
s__instance(s__Object26_1, s__Planet26_1)    fof(local_6, axiom)
¬s__attribute(s__Object26_1, s__Solid)    fof(local_7, axiom)
s__attribute(s__Object26_1, s__HostileToEarthLife)    fof(prove_from_SUMO, conjecture)

```

CSR096+2.p Case elimination

```

include('Axioms/CSR003+1.ax')
include('Axioms/CSR003+4.ax')
s__instance(s__Planet26_1, s__Class)    fof(local_1, axiom)
s__subclass(s__Planet26_1, s__AstronomicalBody)    fof(local_2, axiom)
∀v_P: (s__instance(v_P, s__Object) ⇒ (s__instance(v_P, s__Planet26_1) ⇒ (s__attribute(v_P, s__Solid) or s__attribute(v_P, s__Gaseous))))
∀v_P: (s__instance(v_P, s__Object) ⇒ (s__instance(v_P, s__Planet26_1) ⇒ (s__attribute(v_P, s__Earthlike) or s__attribute(v_P, s__Gaseous))))
∀v_X: (s__instance(v_X, s__Object) ⇒ ((s__instance(v_X, s__Planet26_1) and s__attribute(v_X, s__Gaseous)) ⇒ ¬s__attribute(v_X, s__Solid)))
s__instance(s__Object26_1, s__Planet26_1)    fof(local_6, axiom)
¬s__attribute(s__Object26_1, s__Solid)    fof(local_7, axiom)
s__attribute(s__Object26_1, s__HostileToEarthLife)    fof(prove_from_SUMO_MILO, conjecture)

```

CSR096+3.p Case elimination

```

include('Axioms/CSR003+2.ax')
include('Axioms/CSR003+5.ax')
s__instance(s__Planet26_1, s__Class)    fof(local_1, axiom)
s__subclass(s__Planet26_1, s__AstronomicalBody)    fof(local_2, axiom)
∀v_P: (s__instance(v_P, s__Object) ⇒ (s__instance(v_P, s__Planet26_1) ⇒ (s__attribute(v_P, s__Solid) or s__attribute(v_P, s__Gaseous))))
∀v_P: (s__instance(v_P, s__Object) ⇒ (s__instance(v_P, s__Planet26_1) ⇒ (s__attribute(v_P, s__Earthlike) or s__attribute(v_P, s__Gaseous))))
∀v_X: (s__instance(v_X, s__Object) ⇒ ((s__instance(v_X, s__Planet26_1) and s__attribute(v_X, s__Gaseous)) ⇒ ¬s__attribute(v_X, s__Solid)))
s__instance(s__Object26_1, s__Planet26_1)    fof(local_6, axiom)
¬s__attribute(s__Object26_1, s__Solid)    fof(local_7, axiom)
s__attribute(s__Object26_1, s__HostileToEarthLife)    fof(prove_from_ALL, conjecture)

```


CSR096+4.p Case elimination

```

include('Axioms/CSR003+0.ax')
s__instance(s__Planet261, s__Class)      fof(local1, axiom)
s__subclass(s__Planet261, s__AstronomicalBody)  fof(local2, axiom)
∀v_P: (s__instance(v_P, s__Object) ⇒ (s__instance(v_P, s__Planet261) ⇒ (s__attribute(v_P, s__Solid) or s__attribute(v_P, s__Gaseous))) ⇒ s__attribute(v_P, s__Solid) or s__attribute(v_P, s__Gaseous))
∀v_P: (s__instance(v_P, s__Object) ⇒ (s__instance(v_P, s__Planet261) ⇒ (s__attribute(v_P, s__Earthlike) or s__attribute(v_P, s__Gaseous))) ⇒ s__attribute(v_P, s__Earthlike) or s__attribute(v_P, s__Gaseous))
∀v_X: (s__instance(v_X, s__Object) ⇒ ((s__instance(v_X, s__Planet261) and s__attribute(v_X, s__Gaseous)) ⇒ ¬s__attribute(v_X, s__Gaseous)))
s__instance(s__Object261, s__Planet261)      fof(local6, axiom)
¬s__attribute(s__Object261, s__Solid)      fof(local7, axiom)
s__attribute(s__Object261, s__HostileToEarthLife)  fof(prove_from_SUMO, conjecture)

```

CSR096+5.p Case elimination

```

include('Axioms/CSR003+1.ax')
s__instance(s__Planet261, s__Class)      fof(local1, axiom)
s__subclass(s__Planet261, s__AstronomicalBody)  fof(local2, axiom)
∀v_P: (s__instance(v_P, s__Object) ⇒ (s__instance(v_P, s__Planet261) ⇒ (s__attribute(v_P, s__Solid) or s__attribute(v_P, s__Gaseous))) ⇒ s__attribute(v_P, s__Solid) or s__attribute(v_P, s__Gaseous))
∀v_P: (s__instance(v_P, s__Object) ⇒ (s__instance(v_P, s__Planet261) ⇒ (s__attribute(v_P, s__Earthlike) or s__attribute(v_P, s__Gaseous))) ⇒ s__attribute(v_P, s__Earthlike) or s__attribute(v_P, s__Gaseous))
∀v_X: (s__instance(v_X, s__Object) ⇒ ((s__instance(v_X, s__Planet261) and s__attribute(v_X, s__Gaseous)) ⇒ ¬s__attribute(v_X, s__Gaseous)))
s__instance(s__Object261, s__Planet261)      fof(local6, axiom)
¬s__attribute(s__Object261, s__Solid)      fof(local7, axiom)
s__attribute(s__Object261, s__HostileToEarthLife)  fof(prove_from_SUMO_MILO, conjecture)

```

CSR096+6.p Case elimination

```

include('Axioms/CSR003+2.ax')
s__instance(s__Planet261, s__Class)      fof(local1, axiom)
s__subclass(s__Planet261, s__AstronomicalBody)  fof(local2, axiom)
∀v_P: (s__instance(v_P, s__Object) ⇒ (s__instance(v_P, s__Planet261) ⇒ (s__attribute(v_P, s__Solid) or s__attribute(v_P, s__Gaseous))) ⇒ s__attribute(v_P, s__Solid) or s__attribute(v_P, s__Gaseous))
∀v_P: (s__instance(v_P, s__Object) ⇒ (s__instance(v_P, s__Planet261) ⇒ (s__attribute(v_P, s__Earthlike) or s__attribute(v_P, s__Gaseous))) ⇒ s__attribute(v_P, s__Earthlike) or s__attribute(v_P, s__Gaseous))
∀v_X: (s__instance(v_X, s__Object) ⇒ ((s__instance(v_X, s__Planet261) and s__attribute(v_X, s__Gaseous)) ⇒ ¬s__attribute(v_X, s__Gaseous)))
s__instance(s__Object261, s__Planet261)      fof(local6, axiom)
¬s__attribute(s__Object261, s__Solid)      fof(local7, axiom)
s__attribute(s__Object261, s__HostileToEarthLife)  fof(prove_from_ALL, conjecture)

```

CSR096+7.p Case elimination

```

include('Axioms/CSR003+2.ax')
s__instance(s__Planet261, s__Class)      fof(local1, axiom)
s__subclass(s__Planet261, s__AstronomicalBody)  fof(local2, axiom)
∀v_P: (s__instance(v_P, s__Object) ⇒ (s__instance(v_P, s__Planet261) ⇒ (s__attribute(v_P, s__Solid) or s__attribute(v_P, s__Gaseous))) ⇒ s__attribute(v_P, s__Solid) or s__attribute(v_P, s__Gaseous))
∀v_P: (s__instance(v_P, s__Object) ⇒ (s__instance(v_P, s__Planet261) ⇒ (s__attribute(v_P, s__Earthlike) or s__attribute(v_P, s__Gaseous))) ⇒ s__attribute(v_P, s__Earthlike) or s__attribute(v_P, s__Gaseous))
∀v_X: (s__instance(v_X, s__Object) ⇒ ((s__instance(v_X, s__Planet261) and s__attribute(v_X, s__Gaseous)) ⇒ ¬s__attribute(v_X, s__Gaseous)))
s__instance(s__Object261, s__Planet261)      fof(local6, axiom)
¬s__attribute(s__Object261, s__Solid)      fof(local7, axiom)
∃x_s__Object261: s__attribute(x_s__Object261, s__HostileToEarthLife)  fof(prove_from_ALL, conjecture)

```

CSR097+1.p A gaseous object

```

include('Axioms/CSR003+0.ax')
include('Axioms/CSR003+3.ax')
s__instance(s__Planet281, s__Class)      fof(local1, axiom)
s__subclass(s__Planet281, s__AstronomicalBody)  fof(local2, axiom)
s__instance(s__Rocky, s__Attribute)      fof(local3, axiom)
s__instance(s__Icy, s__Attribute)      fof(local4, axiom)
s__instance(s__Watery, s__Attribute)      fof(local5, axiom)
s__instance(s__Gaseous, s__Attribute)      fof(local6, axiom)
s__contraryAttribute4(s__Rocky, s__Icy, s__Watery, s__Gaseous)  fof(local7, axiom)
s__instance(s__Object281, s__Planet281)      fof(local8, axiom)
s__attribute(s__Object281, s__Watery)      fof(local9, axiom)
¬s__attribute(s__Object281, s__Gaseous)      fof(prove_from_SUMO, conjecture)

```

CSR097+2.p A gaseous object

```

include('Axioms/CSR003+1.ax')
include('Axioms/CSR003+4.ax')
s__instance(s__Planet281, s__Class)      fof(local1, axiom)

```

```

s__subclass(s__Planet281, s__AstronomicalBody)    fof(local2, axiom)
s__instance(s__Rocky, s__Attribute)    fof(local3, axiom)
s__instance(s__Icy, s__Attribute)    fof(local4, axiom)
s__instance(s__Watery, s__Attribute)    fof(local5, axiom)
s__instance(s__Gaseous, s__Attribute)    fof(local6, axiom)
s__contraryAttribute4(s__Rocky, s__Icy, s__Watery, s__Gaseous)    fof(local7, axiom)
s__instance(s__Object281, s__Planet281)    fof(local8, axiom)
s__attribute(s__Object281, s__Watery)    fof(local9, axiom)
¬s__attribute(s__Object281, s__Gaseous)    fof(prove_from_SUMO_MILO, conjecture)

```

CSR097+3.p A gaseous object

```

include('Axioms/CSR003+2.ax')
include('Axioms/CSR003+5.ax')
s__instance(s__Planet281, s__Class)    fof(local1, axiom)
s__subclass(s__Planet281, s__AstronomicalBody)    fof(local2, axiom)
s__instance(s__Rocky, s__Attribute)    fof(local3, axiom)
s__instance(s__Icy, s__Attribute)    fof(local4, axiom)
s__instance(s__Watery, s__Attribute)    fof(local5, axiom)
s__instance(s__Gaseous, s__Attribute)    fof(local6, axiom)
s__contraryAttribute4(s__Rocky, s__Icy, s__Watery, s__Gaseous)    fof(local7, axiom)
s__instance(s__Object281, s__Planet281)    fof(local8, axiom)
s__attribute(s__Object281, s__Watery)    fof(local9, axiom)
¬s__attribute(s__Object281, s__Gaseous)    fof(prove_from_ALL, conjecture)

```

CSR097+4.p A gaseous object

```

include('Axioms/CSR003+0.ax')
s__instance(s__Planet281, s__Class)    fof(local1, axiom)
s__subclass(s__Planet281, s__AstronomicalBody)    fof(local2, axiom)
s__instance(s__Rocky, s__Attribute)    fof(local3, axiom)
s__instance(s__Icy, s__Attribute)    fof(local4, axiom)
s__instance(s__Watery, s__Attribute)    fof(local5, axiom)
s__instance(s__Gaseous, s__Attribute)    fof(local6, axiom)
s__contraryAttribute4(s__Rocky, s__Icy, s__Watery, s__Gaseous)    fof(local7, axiom)
s__instance(s__Object281, s__Planet281)    fof(local8, axiom)
s__attribute(s__Object281, s__Watery)    fof(local9, axiom)
¬s__attribute(s__Object281, s__Gaseous)    fof(prove_from_SUMO, conjecture)

```

CSR097+5.p A gaseous object

```

include('Axioms/CSR003+1.ax')
s__instance(s__Planet281, s__Class)    fof(local1, axiom)
s__subclass(s__Planet281, s__AstronomicalBody)    fof(local2, axiom)
s__instance(s__Rocky, s__Attribute)    fof(local3, axiom)
s__instance(s__Icy, s__Attribute)    fof(local4, axiom)
s__instance(s__Watery, s__Attribute)    fof(local5, axiom)
s__instance(s__Gaseous, s__Attribute)    fof(local6, axiom)
s__contraryAttribute4(s__Rocky, s__Icy, s__Watery, s__Gaseous)    fof(local7, axiom)
s__instance(s__Object281, s__Planet281)    fof(local8, axiom)
s__attribute(s__Object281, s__Watery)    fof(local9, axiom)
¬s__attribute(s__Object281, s__Gaseous)    fof(prove_from_SUMO_MILO, conjecture)

```

CSR097+6.p A gaseous object

```

include('Axioms/CSR003+2.ax')
s__instance(s__Planet281, s__Class)    fof(local1, axiom)
s__subclass(s__Planet281, s__AstronomicalBody)    fof(local2, axiom)
s__instance(s__Rocky, s__Attribute)    fof(local3, axiom)
s__instance(s__Icy, s__Attribute)    fof(local4, axiom)
s__instance(s__Watery, s__Attribute)    fof(local5, axiom)
s__instance(s__Gaseous, s__Attribute)    fof(local6, axiom)
s__contraryAttribute4(s__Rocky, s__Icy, s__Watery, s__Gaseous)    fof(local7, axiom)
s__instance(s__Object281, s__Planet281)    fof(local8, axiom)
s__attribute(s__Object281, s__Watery)    fof(local9, axiom)

```

\neg s_attribute(s_Object28₁, s_Gaseous) fof(prove_from_ALL, conjecture)

CSR098+1.p Equality reasoning

include('Axioms/CSR003+0.ax')

include('Axioms/CSR003+3.ax')

s_instance(s_Frog29₁, s_Amphibian) fof(local₁, axiom)

s_instance(s_Animal29₁, s_Animal) fof(local₂, axiom)

s_Frog29₁ = s_Animal29₁ fof(local₃, axiom)

s_instance(s_Animal29₁, s_Amphibian) fof(prove_from_SUMO, conjecture)

CSR098+2.p Equality reasoning

include('Axioms/CSR003+1.ax')

include('Axioms/CSR003+4.ax')

s_instance(s_Frog29₁, s_Amphibian) fof(local₁, axiom)

s_instance(s_Animal29₁, s_Animal) fof(local₂, axiom)

s_Frog29₁ = s_Animal29₁ fof(local₃, axiom)

s_instance(s_Animal29₁, s_Amphibian) fof(prove_from_SUMO_MILO, conjecture)

CSR098+3.p Equality reasoning

include('Axioms/CSR003+2.ax')

include('Axioms/CSR003+5.ax')

s_instance(s_Frog29₁, s_Amphibian) fof(local₁, axiom)

s_instance(s_Animal29₁, s_Animal) fof(local₂, axiom)

s_Frog29₁ = s_Animal29₁ fof(local₃, axiom)

s_instance(s_Animal29₁, s_Amphibian) fof(prove_from_ALL, conjecture)

CSR098+4.p Equality reasoning

include('Axioms/CSR003+0.ax')

s_instance(s_Frog29₁, s_Amphibian) fof(local₁, axiom)

s_instance(s_Animal29₁, s_Animal) fof(local₂, axiom)

s_Frog29₁ = s_Animal29₁ fof(local₃, axiom)

s_instance(s_Animal29₁, s_Amphibian) fof(prove_from_SUMO, conjecture)

CSR098+5.p Equality reasoning

include('Axioms/CSR003+1.ax')

s_instance(s_Frog29₁, s_Amphibian) fof(local₁, axiom)

s_instance(s_Animal29₁, s_Animal) fof(local₂, axiom)

s_Frog29₁ = s_Animal29₁ fof(local₃, axiom)

s_instance(s_Animal29₁, s_Amphibian) fof(prove_from_SUMO_MILO, conjecture)

CSR098+6.p Equality reasoning

include('Axioms/CSR003+2.ax')

s_instance(s_Frog29₁, s_Amphibian) fof(local₁, axiom)

s_instance(s_Animal29₁, s_Animal) fof(local₂, axiom)

s_Frog29₁ = s_Animal29₁ fof(local₃, axiom)

s_instance(s_Animal29₁, s_Amphibian) fof(prove_from_ALL, conjecture)

CSR098+7.p Equality reasoning

include('Axioms/CSR003+2.ax')

s_instance(s_Frog29₁, s_Amphibian) fof(local₁, axiom)

s_instance(s_Animal29₁, s_Animal) fof(local₂, axiom)

s_Frog29₁ = s_Animal29₁ fof(local₃, axiom)

$\exists x$.s_Animal29₁: s_instance(x.s_Animal29₁, s_Amphibian) fof(prove_from_ALL, conjecture)

CSR099+1.p Reasoning about class equality

include('Axioms/CSR003+0.ax')

include('Axioms/CSR003+3.ax')

s_instance(s_Class30₁, s_Class) fof(local₁, axiom)

s_subclass(s_Class30₁, s_Reptile) fof(local₂, axiom)

s_subclass(s_Reptile, s_Class30₁) fof(local₃, axiom)

s_Class30₁ = s_Reptile fof(prove_from_SUMO, conjecture)

CSR099+2.p Reasoning about class equality

include('Axioms/CSR003+1.ax')

include('Axioms/CSR003+4.ax')

```

s__instance(s__Class301, s__Class)      fof(local1, axiom)
s__subclass(s__Class301, s__Reptile)    fof(local2, axiom)
s__subclass(s__Reptile, s__Class301)    fof(local3, axiom)
s__Class301 = s__Reptile      fof(prove_from_SUMO_MILO, conjecture)

```

CSR099+3.p Reasoning about class equality

```

include('Axioms/CSR003+2.ax')
include('Axioms/CSR003+5.ax')
s__instance(s__Class301, s__Class)      fof(local1, axiom)
s__subclass(s__Class301, s__Reptile)    fof(local2, axiom)
s__subclass(s__Reptile, s__Class301)    fof(local3, axiom)
s__Class301 = s__Reptile      fof(prove_from_ALL, conjecture)

```

CSR099+4.p Reasoning about class equality

```

include('Axioms/CSR003+0.ax')
s__instance(s__Class301, s__Class)      fof(local1, axiom)
s__subclass(s__Class301, s__Reptile)    fof(local2, axiom)
s__subclass(s__Reptile, s__Class301)    fof(local3, axiom)
s__Class301 = s__Reptile      fof(prove_from_SUMO, conjecture)

```

CSR099+5.p Reasoning about class equality

```

include('Axioms/CSR003+1.ax')
s__instance(s__Class301, s__Class)      fof(local1, axiom)
s__subclass(s__Class301, s__Reptile)    fof(local2, axiom)
s__subclass(s__Reptile, s__Class301)    fof(local3, axiom)
s__Class301 = s__Reptile      fof(prove_from_SUMO_MILO, conjecture)

```

CSR099+6.p Reasoning about class equality

```

include('Axioms/CSR003+2.ax')
s__instance(s__Class301, s__Class)      fof(local1, axiom)
s__subclass(s__Class301, s__Reptile)    fof(local2, axiom)
s__subclass(s__Reptile, s__Class301)    fof(local3, axiom)
s__Class301 = s__Reptile      fof(prove_from_ALL, conjecture)

```

CSR100+1.p Circular subclass subsumption reasoning

```

include('Axioms/CSR003+0.ax')
include('Axioms/CSR003+3.ax')
s__instance(s__Class311, s__Class)      fof(local1, axiom)
s__instance(s__Class312, s__Class)      fof(local2, axiom)
s__instance(s__Class313, s__Class)      fof(local3, axiom)
s__subclass(s__Class311, s__Animal)     fof(local4, axiom)
s__subclass(s__Class312, s__Animal)     fof(local5, axiom)
s__subclass(s__Class313, s__Animal)     fof(local6, axiom)
s__subclass(s__Class311, s__Class312)  fof(local7, axiom)
s__subclass(s__Class312, s__Class313)  fof(local8, axiom)
s__subclass(s__Class313, s__Class311)  fof(local9, axiom)
s__instance(s__Animal31, s__Class312)  fof(local10, axiom)
s__instance(s__Animal31, s__Class311)  fof(prove_from_SUMO, conjecture)

```

CSR100+2.p Circular subclass subsumption reasoning

```

include('Axioms/CSR003+1.ax')
include('Axioms/CSR003+4.ax')
s__instance(s__Class311, s__Class)      fof(local1, axiom)
s__instance(s__Class312, s__Class)      fof(local2, axiom)
s__instance(s__Class313, s__Class)      fof(local3, axiom)
s__subclass(s__Class311, s__Animal)     fof(local4, axiom)
s__subclass(s__Class312, s__Animal)     fof(local5, axiom)
s__subclass(s__Class313, s__Animal)     fof(local6, axiom)
s__subclass(s__Class311, s__Class312)  fof(local7, axiom)
s__subclass(s__Class312, s__Class313)  fof(local8, axiom)
s__subclass(s__Class313, s__Class311)  fof(local9, axiom)
s__instance(s__Animal31, s__Class312)  fof(local10, axiom)
s__instance(s__Animal31, s__Class311)  fof(prove_from_SUMO_MILO, conjecture)

```

CSR100+3.p Circular subclass subsumption reasoning

```

include('Axioms/CSR003+2.ax')
include('Axioms/CSR003+5.ax')
s__instance(s__Class31_1, s__Class)      fof(local_1, axiom)
s__instance(s__Class31_2, s__Class)      fof(local_2, axiom)
s__instance(s__Class31_3, s__Class)      fof(local_3, axiom)
s__subclass(s__Class31_1, s__Animal)     fof(local_4, axiom)
s__subclass(s__Class31_2, s__Animal)     fof(local_5, axiom)
s__subclass(s__Class31_3, s__Animal)     fof(local_6, axiom)
s__subclass(s__Class31_1, s__Class31_2)  fof(local_7, axiom)
s__subclass(s__Class31_2, s__Class31_3)  fof(local_8, axiom)
s__subclass(s__Class31_3, s__Class31_1)  fof(local_9, axiom)
s__instance(s__Animal31, s__Class31_2)   fof(local_10, axiom)
s__instance(s__Animal31, s__Class31_1)   fof(prove_from_ALL, conjecture)

```

CSR100+4.p Circular subclass subsumption reasoning

```

include('Axioms/CSR003+0.ax')
s__instance(s__Class31_1, s__Class)      fof(local_1, axiom)
s__instance(s__Class31_2, s__Class)      fof(local_2, axiom)
s__instance(s__Class31_3, s__Class)      fof(local_3, axiom)
s__subclass(s__Class31_1, s__Animal)     fof(local_4, axiom)
s__subclass(s__Class31_2, s__Animal)     fof(local_5, axiom)
s__subclass(s__Class31_3, s__Animal)     fof(local_6, axiom)
s__subclass(s__Class31_1, s__Class31_2)  fof(local_7, axiom)
s__subclass(s__Class31_2, s__Class31_3)  fof(local_8, axiom)
s__subclass(s__Class31_3, s__Class31_1)  fof(local_9, axiom)
s__instance(s__Animal31, s__Class31_2)   fof(local_10, axiom)
s__instance(s__Animal31, s__Class31_1)   fof(prove_from_SUMO, conjecture)

```

CSR100+5.p Circular subclass subsumption reasoning

```

include('Axioms/CSR003+1.ax')
s__instance(s__Class31_1, s__Class)      fof(local_1, axiom)
s__instance(s__Class31_2, s__Class)      fof(local_2, axiom)
s__instance(s__Class31_3, s__Class)      fof(local_3, axiom)
s__subclass(s__Class31_1, s__Animal)     fof(local_4, axiom)
s__subclass(s__Class31_2, s__Animal)     fof(local_5, axiom)
s__subclass(s__Class31_3, s__Animal)     fof(local_6, axiom)
s__subclass(s__Class31_1, s__Class31_2)  fof(local_7, axiom)
s__subclass(s__Class31_2, s__Class31_3)  fof(local_8, axiom)
s__subclass(s__Class31_3, s__Class31_1)  fof(local_9, axiom)
s__instance(s__Animal31, s__Class31_2)   fof(local_10, axiom)
s__instance(s__Animal31, s__Class31_1)   fof(prove_from_SUMO_MILO, conjecture)

```

CSR100+6.p Circular subclass subsumption reasoning

```

include('Axioms/CSR003+2.ax')
s__instance(s__Class31_1, s__Class)      fof(local_1, axiom)
s__instance(s__Class31_2, s__Class)      fof(local_2, axiom)
s__instance(s__Class31_3, s__Class)      fof(local_3, axiom)
s__subclass(s__Class31_1, s__Animal)     fof(local_4, axiom)
s__subclass(s__Class31_2, s__Animal)     fof(local_5, axiom)
s__subclass(s__Class31_3, s__Animal)     fof(local_6, axiom)
s__subclass(s__Class31_1, s__Class31_2)  fof(local_7, axiom)
s__subclass(s__Class31_2, s__Class31_3)  fof(local_8, axiom)
s__subclass(s__Class31_3, s__Class31_1)  fof(local_9, axiom)
s__instance(s__Animal31, s__Class31_2)   fof(local_10, axiom)
s__instance(s__Animal31, s__Class31_1)   fof(prove_from_ALL, conjecture)

```

CSR100+7.p Circular subclass subsumption reasoning

```

include('Axioms/CSR003+2.ax')
s__instance(s__Class31_1, s__Class)      fof(local_1, axiom)
s__instance(s__Class31_2, s__Class)      fof(local_2, axiom)

```

```

s__instance(s__Class313, s__Class)      fof(local3, axiom)
s__subclass(s__Class311, s__Animal)     fof(local4, axiom)
s__subclass(s__Class312, s__Animal)     fof(local5, axiom)
s__subclass(s__Class313, s__Animal)     fof(local6, axiom)
s__subclass(s__Class311, s__Class312)   fof(local7, axiom)
s__subclass(s__Class312, s__Class313)   fof(local8, axiom)
s__subclass(s__Class313, s__Class311)   fof(local9, axiom)
s__instance(s__Animal31, s__Class312)   fof(local10, axiom)
 $\exists x$ . s__Animal31: s__instance(x__s__Animal31, s__Class311)   fof(prove_from_ALL, conjecture)

```

CSR101+1.p An "intensional" query requiring circular subclass reasoning

```

include('Axioms/CSR003+0.ax')
include('Axioms/CSR003+3.ax')
s__instance(s__Class321, s__Class)      fof(local1, axiom)
s__instance(s__Class322, s__Class)      fof(local2, axiom)
s__instance(s__Class323, s__Class)      fof(local3, axiom)
s__subclass(s__Class321, s__Animal)     fof(local4, axiom)
s__subclass(s__Class322, s__Animal)     fof(local5, axiom)
s__subclass(s__Class323, s__Animal)     fof(local6, axiom)
s__subclass(s__Class321, s__Class322)   fof(local7, axiom)
s__subclass(s__Class322, s__Class323)   fof(local8, axiom)
s__subclass(s__Class323, s__Class321)   fof(local9, axiom)
 $\forall v$ .X: (s__instance(v__X, s__Class322)  $\Rightarrow$  s__instance(v__X, s__Class321))   fof(prove_from_SUMO, conjecture)

```

CSR101+2.p An "intensional" query requiring circular subclass reasoning

```

include('Axioms/CSR003+1.ax')
include('Axioms/CSR003+4.ax')
s__instance(s__Class321, s__Class)      fof(local1, axiom)
s__instance(s__Class322, s__Class)      fof(local2, axiom)
s__instance(s__Class323, s__Class)      fof(local3, axiom)
s__subclass(s__Class321, s__Animal)     fof(local4, axiom)
s__subclass(s__Class322, s__Animal)     fof(local5, axiom)
s__subclass(s__Class323, s__Animal)     fof(local6, axiom)
s__subclass(s__Class321, s__Class322)   fof(local7, axiom)
s__subclass(s__Class322, s__Class323)   fof(local8, axiom)
s__subclass(s__Class323, s__Class321)   fof(local9, axiom)
 $\forall v$ .X: (s__instance(v__X, s__Class322)  $\Rightarrow$  s__instance(v__X, s__Class321))   fof(prove_from_SUMO_MILO, conjecture)

```

CSR101+3.p An "intensional" query requiring circular subclass reasoning

```

include('Axioms/CSR003+2.ax')
include('Axioms/CSR003+5.ax')
s__instance(s__Class321, s__Class)      fof(local1, axiom)
s__instance(s__Class322, s__Class)      fof(local2, axiom)
s__instance(s__Class323, s__Class)      fof(local3, axiom)
s__subclass(s__Class321, s__Animal)     fof(local4, axiom)
s__subclass(s__Class322, s__Animal)     fof(local5, axiom)
s__subclass(s__Class323, s__Animal)     fof(local6, axiom)
s__subclass(s__Class321, s__Class322)   fof(local7, axiom)
s__subclass(s__Class322, s__Class323)   fof(local8, axiom)
s__subclass(s__Class323, s__Class321)   fof(local9, axiom)
 $\forall v$ .X: (s__instance(v__X, s__Class322)  $\Rightarrow$  s__instance(v__X, s__Class321))   fof(prove_from_ALL, conjecture)

```

CSR101+4.p An "intensional" query requiring circular subclass reasoning

```

include('Axioms/CSR003+0.ax')
s__instance(s__Class321, s__Class)      fof(local1, axiom)
s__instance(s__Class322, s__Class)      fof(local2, axiom)
s__instance(s__Class323, s__Class)      fof(local3, axiom)
s__subclass(s__Class321, s__Animal)     fof(local4, axiom)
s__subclass(s__Class322, s__Animal)     fof(local5, axiom)
s__subclass(s__Class323, s__Animal)     fof(local6, axiom)
s__subclass(s__Class321, s__Class322)   fof(local7, axiom)

```

$s_subclass(s_Class32_2, s_Class32_3)$ $fof(local_8, axiom)$
 $s_subclass(s_Class32_3, s_Class32_1)$ $fof(local_9, axiom)$
 $\forall v_X: (s_instance(v_X, s_Class32_2) \Rightarrow s_instance(v_X, s_Class32_1))$ $fof(prove_from_SUMO, conjecture)$

CSR101+5.p An "intensional" query requiring circular subclass reasoning

$include('Axioms/CSR003+1.ax')$
 $s_instance(s_Class32_1, s_Class)$ $fof(local_1, axiom)$
 $s_instance(s_Class32_2, s_Class)$ $fof(local_2, axiom)$
 $s_instance(s_Class32_3, s_Class)$ $fof(local_3, axiom)$
 $s_subclass(s_Class32_1, s_Animal)$ $fof(local_4, axiom)$
 $s_subclass(s_Class32_2, s_Animal)$ $fof(local_5, axiom)$
 $s_subclass(s_Class32_3, s_Animal)$ $fof(local_6, axiom)$
 $s_subclass(s_Class32_1, s_Class32_2)$ $fof(local_7, axiom)$
 $s_subclass(s_Class32_2, s_Class32_3)$ $fof(local_8, axiom)$
 $s_subclass(s_Class32_3, s_Class32_1)$ $fof(local_9, axiom)$
 $\forall v_X: (s_instance(v_X, s_Class32_2) \Rightarrow s_instance(v_X, s_Class32_1))$ $fof(prove_from_SUMO_MILO, conjecture)$

CSR101+6.p An "intensional" query requiring circular subclass reasoning

$include('Axioms/CSR003+2.ax')$
 $s_instance(s_Class32_1, s_Class)$ $fof(local_1, axiom)$
 $s_instance(s_Class32_2, s_Class)$ $fof(local_2, axiom)$
 $s_instance(s_Class32_3, s_Class)$ $fof(local_3, axiom)$
 $s_subclass(s_Class32_1, s_Animal)$ $fof(local_4, axiom)$
 $s_subclass(s_Class32_2, s_Animal)$ $fof(local_5, axiom)$
 $s_subclass(s_Class32_3, s_Animal)$ $fof(local_6, axiom)$
 $s_subclass(s_Class32_1, s_Class32_2)$ $fof(local_7, axiom)$
 $s_subclass(s_Class32_2, s_Class32_3)$ $fof(local_8, axiom)$
 $s_subclass(s_Class32_3, s_Class32_1)$ $fof(local_9, axiom)$
 $\forall v_X: (s_instance(v_X, s_Class32_2) \Rightarrow s_instance(v_X, s_Class32_1))$ $fof(prove_from_ALL, conjecture)$

CSR102+1.p Every physical object has some positive mass

$include('Axioms/CSR003+0.ax')$
 $include('Axioms/CSR003+3.ax')$
 $s_instance(s_Animal33_1, s_Animal)$ $fof(local_1, axiom)$
 $\exists v_X: (greater(v_X, n_0) \text{ and } s_weight(s_Animal33_1, s_MeasureFn(v_X, s_PoundMass)))$ $fof(prove_from_SUMO, conjecture)$

CSR102+2.p Every physical object has some positive mass

$include('Axioms/CSR003+1.ax')$
 $include('Axioms/CSR003+4.ax')$
 $s_instance(s_Animal33_1, s_Animal)$ $fof(local_1, axiom)$
 $\exists v_X: (greater(v_X, n_0) \text{ and } s_weight(s_Animal33_1, s_MeasureFn(v_X, s_PoundMass)))$ $fof(prove_from_SUMO_MILO, c$

CSR102+3.p Every physical object has some positive mass

$include('Axioms/CSR003+2.ax')$
 $include('Axioms/CSR003+5.ax')$
 $s_instance(s_Animal33_1, s_Animal)$ $fof(local_1, axiom)$
 $\exists v_X: (greater(v_X, n_0) \text{ and } s_weight(s_Animal33_1, s_MeasureFn(v_X, s_PoundMass)))$ $fof(prove_from_ALL, conjecture)$

CSR102+4.p Every physical object has some positive mass

$include('Axioms/CSR003+0.ax')$
 $s_instance(s_Animal33_1, s_Animal)$ $fof(local_1, axiom)$
 $\exists v_X: (greater(v_X, n_0) \text{ and } s_weight(s_Animal33_1, s_MeasureFn(v_X, s_PoundMass)))$ $fof(prove_from_SUMO, conjecture)$

CSR102+5.p Every physical object has some positive mass

$include('Axioms/CSR003+1.ax')$
 $s_instance(s_Animal33_1, s_Animal)$ $fof(local_1, axiom)$
 $\exists v_X: (greater(v_X, n_0) \text{ and } s_weight(s_Animal33_1, s_MeasureFn(v_X, s_PoundMass)))$ $fof(prove_from_SUMO_MILO, c$

CSR102+6.p Every physical object has some positive mass

$include('Axioms/CSR003+2.ax')$
 $s_instance(s_Animal33_1, s_Animal)$ $fof(local_1, axiom)$
 $\exists v_X: (greater(v_X, n_0) \text{ and } s_weight(s_Animal33_1, s_MeasureFn(v_X, s_PoundMass)))$ $fof(prove_from_ALL, conjecture)$

CSR103+1.p Every term is an instance of Entity

$include('Axioms/CSR003+0.ax')$

include('Axioms/CSR003+3.ax')
 $\forall v_X: s_instance(v_X, s_Entity) \quad fof(prove_from_SUMO, conjecture)$

CSR103+2.p Every term is an instance of Entity

include('Axioms/CSR003+1.ax')
include('Axioms/CSR003+4.ax')
 $\forall v_X: s_instance(v_X, s_Entity) \quad fof(prove_from_SUMO_MILO, conjecture)$

CSR103+3.p Every term is an instance of Entity.

include('Axioms/CSR003+2.ax')
include('Axioms/CSR003+5.ax')
 $\forall v_X: s_instance(v_X, s_Entity) \quad fof(prove_from_ALL, conjecture)$

CSR103+4.p Every term is an instance of Entity

include('Axioms/CSR003+0.ax')
 $\forall v_X: s_instance(v_X, s_Entity) \quad fof(prove_from_SUMO, conjecture)$

CSR103+5.p Every term is an instance of Entity

include('Axioms/CSR003+1.ax')
 $\forall v_X: s_instance(v_X, s_Entity) \quad fof(prove_from_SUMO_MILO, conjecture)$

CSR103+6.p Every term is an instance of Entity.

include('Axioms/CSR003+2.ax')
 $\forall v_X: s_instance(v_X, s_Entity) \quad fof(prove_from_ALL, conjecture)$

CSR103+7.p Every term is an instance of Entity.

include('Axioms/CSR003+2.ax')
 $\exists x_s_Entity: \forall v_X: s_instance(v_X, x_s_Entity) \quad fof(prove_from_ALL, conjecture)$

CSR104+1.p Temporal point and interval reasoning

include('Axioms/CSR003+0.ax')
include('Axioms/CSR003+3.ax')
 $s_instance(s_TimePoint35_1, s_TimePoint) \quad fof(local_1, axiom)$
 $s_instance(s_TimeInterval35_1, s_TimeInterval) \quad fof(local_2, axiom)$
 $s_instance(s_TimeInterval35_2, s_TimeInterval) \quad fof(local_3, axiom)$
 $s_temporalPart(s_TimePoint35_1, s_TimeInterval35_1) \quad fof(local_4, axiom)$
 $s_during(s_TimeInterval35_1, s_TimeInterval35_2) \quad fof(local_5, axiom)$
 $s_temporalPart(s_TimePoint35_1, s_TimeInterval35_2) \quad fof(prove_from_SUMO, conjecture)$

CSR104+2.p Temporal point and interval reasoning

include('Axioms/CSR003+1.ax')
include('Axioms/CSR003+4.ax')
 $s_instance(s_TimePoint35_1, s_TimePoint) \quad fof(local_1, axiom)$
 $s_instance(s_TimeInterval35_1, s_TimeInterval) \quad fof(local_2, axiom)$
 $s_instance(s_TimeInterval35_2, s_TimeInterval) \quad fof(local_3, axiom)$
 $s_temporalPart(s_TimePoint35_1, s_TimeInterval35_1) \quad fof(local_4, axiom)$
 $s_during(s_TimeInterval35_1, s_TimeInterval35_2) \quad fof(local_5, axiom)$
 $s_temporalPart(s_TimePoint35_1, s_TimeInterval35_2) \quad fof(prove_from_SUMO_MILO, conjecture)$

CSR104+3.p Temporal point and interval reasoning

include('Axioms/CSR003+2.ax')
include('Axioms/CSR003+5.ax')
 $s_instance(s_TimePoint35_1, s_TimePoint) \quad fof(local_1, axiom)$
 $s_instance(s_TimeInterval35_1, s_TimeInterval) \quad fof(local_2, axiom)$
 $s_instance(s_TimeInterval35_2, s_TimeInterval) \quad fof(local_3, axiom)$
 $s_temporalPart(s_TimePoint35_1, s_TimeInterval35_1) \quad fof(local_4, axiom)$
 $s_during(s_TimeInterval35_1, s_TimeInterval35_2) \quad fof(local_5, axiom)$
 $s_temporalPart(s_TimePoint35_1, s_TimeInterval35_2) \quad fof(prove_from_ALL, conjecture)$

CSR104+4.p Temporal point and interval reasoning

include('Axioms/CSR003+0.ax')
 $s_instance(s_TimePoint35_1, s_TimePoint) \quad fof(local_1, axiom)$
 $s_instance(s_TimeInterval35_1, s_TimeInterval) \quad fof(local_2, axiom)$
 $s_instance(s_TimeInterval35_2, s_TimeInterval) \quad fof(local_3, axiom)$
 $s_temporalPart(s_TimePoint35_1, s_TimeInterval35_1) \quad fof(local_4, axiom)$

s_during(s_TimeInterval351, s_TimeInterval352) fof(local5, axiom)
s_temporalPart(s_TimePoint351, s_TimeInterval352) fof(prove_from_SUMO, conjecture)

CSR104+5.p Temporal point and interval reasoning

include('Axioms/CSR003+1.ax')
s_instance(s_TimePoint351, s_TimePoint) fof(local1, axiom)
s_instance(s_TimeInterval351, s_TimeInterval) fof(local2, axiom)
s_instance(s_TimeInterval352, s_TimeInterval) fof(local3, axiom)
s_temporalPart(s_TimePoint351, s_TimeInterval351) fof(local4, axiom)
s_during(s_TimeInterval351, s_TimeInterval352) fof(local5, axiom)
s_temporalPart(s_TimePoint351, s_TimeInterval352) fof(prove_from_SUMO_MILO, conjecture)

CSR104+6.p Temporal point and interval reasoning

include('Axioms/CSR003+2.ax')
s_instance(s_TimePoint351, s_TimePoint) fof(local1, axiom)
s_instance(s_TimeInterval351, s_TimeInterval) fof(local2, axiom)
s_instance(s_TimeInterval352, s_TimeInterval) fof(local3, axiom)
s_temporalPart(s_TimePoint351, s_TimeInterval351) fof(local4, axiom)
s_during(s_TimeInterval351, s_TimeInterval352) fof(local5, axiom)
s_temporalPart(s_TimePoint351, s_TimeInterval352) fof(prove_from_ALL, conjecture)

CSR104+7.p Temporal point and interval reasoning

include('Axioms/CSR003+2.ax')
s_instance(s_TimePoint351, s_TimePoint) fof(local1, axiom)
s_instance(s_TimeInterval351, s_TimeInterval) fof(local2, axiom)
s_instance(s_TimeInterval352, s_TimeInterval) fof(local3, axiom)
s_temporalPart(s_TimePoint351, s_TimeInterval351) fof(local4, axiom)
s_during(s_TimeInterval351, s_TimeInterval352) fof(local5, axiom)
 $\exists x$.s_TimeInterval352: s_temporalPart(s_TimePoint351, x.s_TimeInterval352) fof(prove_from_ALL, conjecture)

CSR105+1.p Temporal interval reasoning

include('Axioms/CSR003+0.ax')
include('Axioms/CSR003+3.ax')
s_instance(s_TimeInterval361, s_TimeInterval) fof(local1, axiom)
s_instance(s_TimeInterval362, s_TimeInterval) fof(local2, axiom)
s_instance(s_TimeInterval363, s_TimeInterval) fof(local3, axiom)
s_starts(s_TimeInterval361, s_TimeInterval363) fof(local4, axiom)
s_starts(s_TimeInterval362, s_TimeInterval363) fof(local5, axiom)
s_overlapsTemporally(s_TimeInterval361, s_TimeInterval362) fof(prove_from_SUMO, conjecture)

CSR105+2.p Temporal interval reasoning

include('Axioms/CSR003+1.ax')
include('Axioms/CSR003+4.ax')
s_instance(s_TimeInterval361, s_TimeInterval) fof(local1, axiom)
s_instance(s_TimeInterval362, s_TimeInterval) fof(local2, axiom)
s_instance(s_TimeInterval363, s_TimeInterval) fof(local3, axiom)
s_starts(s_TimeInterval361, s_TimeInterval363) fof(local4, axiom)
s_starts(s_TimeInterval362, s_TimeInterval363) fof(local5, axiom)
s_overlapsTemporally(s_TimeInterval361, s_TimeInterval362) fof(prove_from_SUMO_MILO, conjecture)

CSR105+3.p Temporal interval reasoning

include('Axioms/CSR003+2.ax')
include('Axioms/CSR003+5.ax')
s_instance(s_TimeInterval361, s_TimeInterval) fof(local1, axiom)
s_instance(s_TimeInterval362, s_TimeInterval) fof(local2, axiom)
s_instance(s_TimeInterval363, s_TimeInterval) fof(local3, axiom)
s_starts(s_TimeInterval361, s_TimeInterval363) fof(local4, axiom)
s_starts(s_TimeInterval362, s_TimeInterval363) fof(local5, axiom)
s_overlapsTemporally(s_TimeInterval361, s_TimeInterval362) fof(prove_from_ALL, conjecture)

CSR105+4.p Temporal interval reasoning

include('Axioms/CSR003+0.ax')
s_instance(s_TimeInterval361, s_TimeInterval) fof(local1, axiom)

```

s__instance(s__TimeInterval362, s__TimeInterval)    fof(local2, axiom)
s__instance(s__TimeInterval363, s__TimeInterval)    fof(local3, axiom)
s__starts(s__TimeInterval361, s__TimeInterval363)   fof(local4, axiom)
s__starts(s__TimeInterval362, s__TimeInterval363)   fof(local5, axiom)
s__overlapsTemporally(s__TimeInterval361, s__TimeInterval362) fof(prove_from_SUMO, conjecture)

```

CSR105+5.p Temporal interval reasoning

```

include('Axioms/CSR003+1.ax')
s__instance(s__TimeInterval361, s__TimeInterval)    fof(local1, axiom)
s__instance(s__TimeInterval362, s__TimeInterval)    fof(local2, axiom)
s__instance(s__TimeInterval363, s__TimeInterval)    fof(local3, axiom)
s__starts(s__TimeInterval361, s__TimeInterval363)   fof(local4, axiom)
s__starts(s__TimeInterval362, s__TimeInterval363)   fof(local5, axiom)
s__overlapsTemporally(s__TimeInterval361, s__TimeInterval362) fof(prove_from_SUMO_MILO, conjecture)

```

CSR105+6.p Temporal interval reasoning

```

include('Axioms/CSR003+2.ax')
s__instance(s__TimeInterval361, s__TimeInterval)    fof(local1, axiom)
s__instance(s__TimeInterval362, s__TimeInterval)    fof(local2, axiom)
s__instance(s__TimeInterval363, s__TimeInterval)    fof(local3, axiom)
s__starts(s__TimeInterval361, s__TimeInterval363)   fof(local4, axiom)
s__starts(s__TimeInterval362, s__TimeInterval363)   fof(local5, axiom)
s__overlapsTemporally(s__TimeInterval361, s__TimeInterval362) fof(prove_from_ALL, conjecture)

```

CSR105+7.p Temporal interval reasoning

```

include('Axioms/CSR003+2.ax')
s__instance(s__TimeInterval361, s__TimeInterval)    fof(local1, axiom)
s__instance(s__TimeInterval362, s__TimeInterval)    fof(local2, axiom)
s__instance(s__TimeInterval363, s__TimeInterval)    fof(local3, axiom)
s__starts(s__TimeInterval361, s__TimeInterval363)   fof(local4, axiom)
s__starts(s__TimeInterval362, s__TimeInterval363)   fof(local5, axiom)
∃x_s__TimeInterval361, x_s__TimeInterval362: s__overlapsTemporally(x_s__TimeInterval361, x_s__TimeInterval362) fof(p

```

CSR106+1.p Temporal point and interval reasoning

```

include('Axioms/CSR003+0.ax')
include('Axioms/CSR003+3.ax')
s__instance(s__TimeInterval371, s__TimeInterval)    fof(local1, axiom)
s__instance(s__TimeInterval372, s__TimeInterval)    fof(local2, axiom)
s__earlier(s__TimeInterval371, s__TimeInterval372) fof(local3, axiom)
s__instance(s__TimePoint371, s__TimePoint)         fof(local4, axiom)
s__instance(s__TimePoint372, s__TimePoint)         fof(local5, axiom)
s__temporalPart(s__TimePoint371, s__TimeInterval371) fof(local6, axiom)
s__temporalPart(s__TimePoint372, s__TimeInterval372) fof(local7, axiom)
¬s__before(s__TimePoint372, s__TimePoint371)       fof(prove_from_SUMO, conjecture)

```

CSR106+2.p Temporal point and interval reasoning

```

include('Axioms/CSR003+1.ax')
include('Axioms/CSR003+4.ax')
s__instance(s__TimeInterval371, s__TimeInterval)    fof(local1, axiom)
s__instance(s__TimeInterval372, s__TimeInterval)    fof(local2, axiom)
s__earlier(s__TimeInterval371, s__TimeInterval372) fof(local3, axiom)
s__instance(s__TimePoint371, s__TimePoint)         fof(local4, axiom)
s__instance(s__TimePoint372, s__TimePoint)         fof(local5, axiom)
s__temporalPart(s__TimePoint371, s__TimeInterval371) fof(local6, axiom)
s__temporalPart(s__TimePoint372, s__TimeInterval372) fof(local7, axiom)
¬s__before(s__TimePoint372, s__TimePoint371)       fof(prove_from_SUMO_MILO, conjecture)

```

CSR106+3.p Temporal point and interval reasoning

```

include('Axioms/CSR003+2.ax')
include('Axioms/CSR003+5.ax')
s__instance(s__TimeInterval371, s__TimeInterval)    fof(local1, axiom)
s__instance(s__TimeInterval372, s__TimeInterval)    fof(local2, axiom)
s__earlier(s__TimeInterval371, s__TimeInterval372) fof(local3, axiom)

```

```

s__instance(s__TimePoint371, s__TimePoint)    fof(local4, axiom)
s__instance(s__TimePoint372, s__TimePoint)    fof(local5, axiom)
s__temporalPart(s__TimePoint371, s__TimeInterval371)  fof(local6, axiom)
s__temporalPart(s__TimePoint372, s__TimeInterval372)  fof(local7, axiom)
¬s__before(s__TimePoint372, s__TimePoint371)    fof(prove_from_ALL, conjecture)

```

CSR106+4.p Temporal point and interval reasoning

```

include('Axioms/CSR003+0.ax')
s__instance(s__TimeInterval371, s__TimeInterval)    fof(local1, axiom)
s__instance(s__TimeInterval372, s__TimeInterval)    fof(local2, axiom)
s__earlier(s__TimeInterval371, s__TimeInterval372)  fof(local3, axiom)
s__instance(s__TimePoint371, s__TimePoint)    fof(local4, axiom)
s__instance(s__TimePoint372, s__TimePoint)    fof(local5, axiom)
s__temporalPart(s__TimePoint371, s__TimeInterval371)  fof(local6, axiom)
s__temporalPart(s__TimePoint372, s__TimeInterval372)  fof(local7, axiom)
¬s__before(s__TimePoint372, s__TimePoint371)    fof(prove_from_SUMO, conjecture)

```

CSR106+5.p Temporal point and interval reasoning

```

include('Axioms/CSR003+1.ax')
s__instance(s__TimeInterval371, s__TimeInterval)    fof(local1, axiom)
s__instance(s__TimeInterval372, s__TimeInterval)    fof(local2, axiom)
s__earlier(s__TimeInterval371, s__TimeInterval372)  fof(local3, axiom)
s__instance(s__TimePoint371, s__TimePoint)    fof(local4, axiom)
s__instance(s__TimePoint372, s__TimePoint)    fof(local5, axiom)
s__temporalPart(s__TimePoint371, s__TimeInterval371)  fof(local6, axiom)
s__temporalPart(s__TimePoint372, s__TimeInterval372)  fof(local7, axiom)
¬s__before(s__TimePoint372, s__TimePoint371)    fof(prove_from_SUMO_MILO, conjecture)

```

CSR106+6.p Temporal point and interval reasoning

```

include('Axioms/CSR003+2.ax')
s__instance(s__TimeInterval371, s__TimeInterval)    fof(local1, axiom)
s__instance(s__TimeInterval372, s__TimeInterval)    fof(local2, axiom)
s__earlier(s__TimeInterval371, s__TimeInterval372)  fof(local3, axiom)
s__instance(s__TimePoint371, s__TimePoint)    fof(local4, axiom)
s__instance(s__TimePoint372, s__TimePoint)    fof(local5, axiom)
s__temporalPart(s__TimePoint371, s__TimeInterval371)  fof(local6, axiom)
s__temporalPart(s__TimePoint372, s__TimeInterval372)  fof(local7, axiom)
¬s__before(s__TimePoint372, s__TimePoint371)    fof(prove_from_ALL, conjecture)

```

CSR106+7.p Temporal point and interval reasoning

```

include('Axioms/CSR003+2.ax')
s__instance(s__TimeInterval371, s__TimeInterval)    fof(local1, axiom)
s__instance(s__TimeInterval372, s__TimeInterval)    fof(local2, axiom)
s__earlier(s__TimeInterval371, s__TimeInterval372)  fof(local3, axiom)
s__instance(s__TimePoint371, s__TimePoint)    fof(local4, axiom)
s__instance(s__TimePoint372, s__TimePoint)    fof(local5, axiom)
s__temporalPart(s__TimePoint371, s__TimeInterval371)  fof(local6, axiom)
s__temporalPart(s__TimePoint372, s__TimeInterval372)  fof(local7, axiom)
∃x_s__TimePoint372, x_s__TimePoint371: ¬s__before(x_s__TimePoint372, x_s__TimePoint371)    fof(prove_from_ALL, conjecture)

```

CSR107+1.p Temporal point and interval reasoning

```

include('Axioms/CSR003+0.ax')
include('Axioms/CSR003+3.ax')
s__instance(s__TimeInterval381, s__TimeInterval)    fof(local1, axiom)
s__instance(s__TimeInterval382, s__TimeInterval)    fof(local2, axiom)
s__instance(s__TimeInterval383, s__TimeInterval)    fof(local3, axiom)
s__earlier(s__TimeInterval381, s__TimeInterval382)  fof(local4, axiom)
s__instance(s__TimePoint381, s__TimePoint)    fof(local5, axiom)
s__instance(s__TimePoint382, s__TimePoint)    fof(local6, axiom)
s__temporalPart(s__TimePoint381, s__TimeInterval381)  fof(local7, axiom)
s__temporalPart(s__TimePoint381, s__TimeInterval383)  fof(local8, axiom)
s__temporalPart(s__TimePoint382, s__TimeInterval382)  fof(local9, axiom)

```



```

include('Axioms/CSR003+2.ax')
s__instance(s__TimeInterval381, s__TimeInterval)    fof(local1, axiom)
s__instance(s__TimeInterval382, s__TimeInterval)    fof(local2, axiom)
s__instance(s__TimeInterval383, s__TimeInterval)    fof(local3, axiom)
s__earlier(s__TimeInterval381, s__TimeInterval382)  fof(local4, axiom)
s__instance(s__TimePoint381, s__TimePoint)         fof(local5, axiom)
s__instance(s__TimePoint382, s__TimePoint)         fof(local6, axiom)
s__temporalPart(s__TimePoint381, s__TimeInterval381) fof(local7, axiom)
s__temporalPart(s__TimePoint381, s__TimeInterval383) fof(local8, axiom)
s__temporalPart(s__TimePoint382, s__TimeInterval382) fof(local9, axiom)
s__temporalPart(s__TimePoint382, s__TimeInterval383) fof(local10, axiom)
s__overlapsTemporally(s__TimeInterval383, s__TimeInterval381) and s__overlapsTemporally(s__TimeInterval383, s__TimeInterval382)

```

CSR107+7.p Temporal point and interval reasoning

```

include('Axioms/CSR003+2.ax')
s__instance(s__TimeInterval381, s__TimeInterval)    fof(local1, axiom)
s__instance(s__TimeInterval382, s__TimeInterval)    fof(local2, axiom)
s__instance(s__TimeInterval383, s__TimeInterval)    fof(local3, axiom)
s__earlier(s__TimeInterval381, s__TimeInterval382)  fof(local4, axiom)
s__instance(s__TimePoint381, s__TimePoint)         fof(local5, axiom)
s__instance(s__TimePoint382, s__TimePoint)         fof(local6, axiom)
s__temporalPart(s__TimePoint381, s__TimeInterval381) fof(local7, axiom)
s__temporalPart(s__TimePoint381, s__TimeInterval383) fof(local8, axiom)
s__temporalPart(s__TimePoint382, s__TimeInterval382) fof(local9, axiom)
s__temporalPart(s__TimePoint382, s__TimeInterval383) fof(local10, axiom)
∃x_s__TimeInterval381, x_s__TimeInterval382: (s__overlapsTemporally(s__TimeInterval383, x_s__TimeInterval381) and s__overlapsTemporally(s__TimeInterval383, x_s__TimeInterval382))

```

CSR108+1.p Defines a new predicate of 10 arguments

```

include('Axioms/CSR003+0.ax')
include('Axioms/CSR003+3.ax')
s__instance(s__testPred44.1_M, s__Predicate)    fof(local1, axiom)
s__valence(s__testPred44.1_M, n10)             fof(local2, axiom)
s__domain(s__testPred44.1_M, n1, s__Entity)    fof(local3, axiom)
s__domain(s__testPred44.1_M, n2, s__Entity)    fof(local4, axiom)
s__domain(s__testPred44.1_M, n3, s__Entity)    fof(local5, axiom)
s__domain(s__testPred44.1_M, n4, s__Entity)    fof(local6, axiom)
s__domain(s__testPred44.1_M, n5, s__Entity)    fof(local7, axiom)
s__domain(s__testPred44.1_M, n6, s__Entity)    fof(local8, axiom)
s__domain(s__testPred44.1_M, n7, s__Entity)    fof(local9, axiom)
s__domain(s__testPred44.1_M, n8, s__Entity)    fof(local10, axiom)
s__domain(s__testPred44.1_M, n9, s__Entity)    fof(local11, axiom)
s__domain(s__testPred44.1_M, n10, s__Entity)   fof(local12, axiom)
s__instance(s__Entity44_1, s__Entity)          fof(local13, axiom)
s__instance(s__Entity44_2, s__Entity)          fof(local14, axiom)
s__instance(s__Entity44_3, s__Entity)          fof(local15, axiom)
s__instance(s__Entity44_4, s__Entity)          fof(local16, axiom)
s__instance(s__Entity44_5, s__Entity)          fof(local17, axiom)
s__instance(s__Entity44_6, s__Entity)          fof(local18, axiom)
s__instance(s__Entity44_7, s__Entity)          fof(local19, axiom)
s__instance(s__Entity44_8, s__Entity)          fof(local20, axiom)
s__instance(s__Entity44_9, s__Entity)          fof(local21, axiom)
s__instance(s__Entity44_10, s__Entity)         fof(local22, axiom)
s__testPred44.1_10(s__Entity44_1, s__Entity44_2, s__Entity44_3, s__Entity44_4, s__Entity44_5, s__Entity44_6, s__Entity44_7, s__Entity44_8, s__Entity44_9, s__Entity44_10)
∀v_ARG1, v_ARG2, v_ARG3, v_ARG4, v_ARG5, v_ARG6, v_ARG7, v_ARG8, v_ARG9, v_ARG10: (s__testPred44.1_10(v_ARG1, v_ARG2, v_ARG3, v_ARG4, v_ARG5, v_ARG6, v_ARG7, v_ARG8, v_ARG9, v_ARG10) and s__instance(v_ARG1, s__Amphibian) and s__instance(v_ARG2, s__Bird) and s__instance(v_ARG9, s__Mammal) and s__instance(v_ARG10, s__Mammal) and s__instance(s__Entity44_1, s__Animal) and s__instance(s__Entity44_2, s__Animal) and s__instance(s__Entity44_9, s__Animal) and s__instance(s__Entity44_10, s__Animal))

```

CSR108+2.p Defines a new predicate of 10 arguments

```

include('Axioms/CSR003+1.ax')
include('Axioms/CSR003+4.ax')
s__instance(s__testPred44.1_M, s__Predicate)    fof(local1, axiom)

```

```

s__valence(s__testPred44.1_M, n10)    fof(local2, axiom)
s__domain(s__testPred44.1_M, n1, s__Entity)    fof(local3, axiom)
s__domain(s__testPred44.1_M, n2, s__Entity)    fof(local4, axiom)
s__domain(s__testPred44.1_M, n3, s__Entity)    fof(local5, axiom)
s__domain(s__testPred44.1_M, n4, s__Entity)    fof(local6, axiom)
s__domain(s__testPred44.1_M, n5, s__Entity)    fof(local7, axiom)
s__domain(s__testPred44.1_M, n6, s__Entity)    fof(local8, axiom)
s__domain(s__testPred44.1_M, n7, s__Entity)    fof(local9, axiom)
s__domain(s__testPred44.1_M, n8, s__Entity)    fof(local10, axiom)
s__domain(s__testPred44.1_M, n9, s__Entity)    fof(local11, axiom)
s__domain(s__testPred44.1_M, n10, s__Entity)    fof(local12, axiom)
s__instance(s__Entity441, s__Entity)    fof(local13, axiom)
s__instance(s__Entity442, s__Entity)    fof(local14, axiom)
s__instance(s__Entity443, s__Entity)    fof(local15, axiom)
s__instance(s__Entity444, s__Entity)    fof(local16, axiom)
s__instance(s__Entity445, s__Entity)    fof(local17, axiom)
s__instance(s__Entity446, s__Entity)    fof(local18, axiom)
s__instance(s__Entity447, s__Entity)    fof(local19, axiom)
s__instance(s__Entity448, s__Entity)    fof(local20, axiom)
s__instance(s__Entity449, s__Entity)    fof(local21, axiom)
s__instance(s__Entity4410, s__Entity)    fof(local22, axiom)
s__testPred44.1-10(s__Entity441, s__Entity442, s__Entity443, s__Entity444, s__Entity445, s__Entity446, s__Entity447, s__Entity448,
∀v_ARG1, v_ARG2, v_ARG3, v_ARG4, v_ARG5, v_ARG6, v_ARG7, v_ARG8, v_ARG9, v_ARG10: (s__testPred44.1-10(v_ARG1, v
(s__instance(v_ARG1, s__Amphibian) and s__instance(v_ARG2, s__Bird) and s__instance(v_ARG9, s__Mammal) and s__instance
s__instance(s__Entity441, s__Animal) and s__instance(s__Entity442, s__Animal) and s__instance(s__Entity449, s__Animal) and s

```

CSR108+3.p Defines a new predicate of 10 arguments

```

include('Axioms/CSR003+2.ax')
include('Axioms/CSR003+5.ax')
s__instance(s__testPred44.1_M, s__Predicate)    fof(local1, axiom)
s__valence(s__testPred44.1_M, n10)    fof(local2, axiom)
s__domain(s__testPred44.1_M, n1, s__Entity)    fof(local3, axiom)
s__domain(s__testPred44.1_M, n2, s__Entity)    fof(local4, axiom)
s__domain(s__testPred44.1_M, n3, s__Entity)    fof(local5, axiom)
s__domain(s__testPred44.1_M, n4, s__Entity)    fof(local6, axiom)
s__domain(s__testPred44.1_M, n5, s__Entity)    fof(local7, axiom)
s__domain(s__testPred44.1_M, n6, s__Entity)    fof(local8, axiom)
s__domain(s__testPred44.1_M, n7, s__Entity)    fof(local9, axiom)
s__domain(s__testPred44.1_M, n8, s__Entity)    fof(local10, axiom)
s__domain(s__testPred44.1_M, n9, s__Entity)    fof(local11, axiom)
s__domain(s__testPred44.1_M, n10, s__Entity)    fof(local12, axiom)
s__instance(s__Entity441, s__Entity)    fof(local13, axiom)
s__instance(s__Entity442, s__Entity)    fof(local14, axiom)
s__instance(s__Entity443, s__Entity)    fof(local15, axiom)
s__instance(s__Entity444, s__Entity)    fof(local16, axiom)
s__instance(s__Entity445, s__Entity)    fof(local17, axiom)
s__instance(s__Entity446, s__Entity)    fof(local18, axiom)
s__instance(s__Entity447, s__Entity)    fof(local19, axiom)
s__instance(s__Entity448, s__Entity)    fof(local20, axiom)
s__instance(s__Entity449, s__Entity)    fof(local21, axiom)
s__instance(s__Entity4410, s__Entity)    fof(local22, axiom)
s__testPred44.1-10(s__Entity441, s__Entity442, s__Entity443, s__Entity444, s__Entity445, s__Entity446, s__Entity447, s__Entity448,
∀v_ARG1, v_ARG2, v_ARG3, v_ARG4, v_ARG5, v_ARG6, v_ARG7, v_ARG8, v_ARG9, v_ARG10: (s__testPred44.1-10(v_ARG1, v
(s__instance(v_ARG1, s__Amphibian) and s__instance(v_ARG2, s__Bird) and s__instance(v_ARG9, s__Mammal) and s__instance
s__instance(s__Entity441, s__Animal) and s__instance(s__Entity442, s__Animal) and s__instance(s__Entity449, s__Animal) and s

```

CSR108+4.p Defines a new predicate of 10 arguments

```

include('Axioms/CSR003+0.ax')
s__instance(s__testPred44.1_M, s__Predicate)    fof(local1, axiom)
s__valence(s__testPred44.1_M, n10)    fof(local2, axiom)

```

```

s__domain(s__testPred44_1_M, n1, s__Entity)    fof(local3, axiom)
s__domain(s__testPred44_1_M, n2, s__Entity)    fof(local4, axiom)
s__domain(s__testPred44_1_M, n3, s__Entity)    fof(local5, axiom)
s__domain(s__testPred44_1_M, n4, s__Entity)    fof(local6, axiom)
s__domain(s__testPred44_1_M, n5, s__Entity)    fof(local7, axiom)
s__domain(s__testPred44_1_M, n6, s__Entity)    fof(local8, axiom)
s__domain(s__testPred44_1_M, n7, s__Entity)    fof(local9, axiom)
s__domain(s__testPred44_1_M, n8, s__Entity)    fof(local10, axiom)
s__domain(s__testPred44_1_M, n9, s__Entity)    fof(local11, axiom)
s__domain(s__testPred44_1_M, n10, s__Entity)    fof(local12, axiom)
s__instance(s__Entity44_1, s__Entity)          fof(local13, axiom)
s__instance(s__Entity44_2, s__Entity)          fof(local14, axiom)
s__instance(s__Entity44_3, s__Entity)          fof(local15, axiom)
s__instance(s__Entity44_4, s__Entity)          fof(local16, axiom)
s__instance(s__Entity44_5, s__Entity)          fof(local17, axiom)
s__instance(s__Entity44_6, s__Entity)          fof(local18, axiom)
s__instance(s__Entity44_7, s__Entity)          fof(local19, axiom)
s__instance(s__Entity44_8, s__Entity)          fof(local20, axiom)
s__instance(s__Entity44_9, s__Entity)          fof(local21, axiom)
s__instance(s__Entity44_10, s__Entity)         fof(local22, axiom)
s__testPred44_1_10(s__Entity44_1, s__Entity44_2, s__Entity44_3, s__Entity44_4, s__Entity44_5, s__Entity44_6, s__Entity44_7, s__Entity44_8,
∀v_ARG1, v_ARG2, v_ARG3, v_ARG4, v_ARG5, v_ARG6, v_ARG7, v_ARG8, v_ARG9, v_ARG10: (s__testPred44_1_10(v_ARG1, v
(s__instance(v_ARG1, s__Amphibian) and s__instance(v_ARG2, s__Bird) and s__instance(v_ARG9, s__Mammal) and s__instance
s__instance(s__Entity44_1, s__Animal) and s__instance(s__Entity44_2, s__Animal) and s__instance(s__Entity44_9, s__Animal) and s

```

CSR108+5.p Defines a new predicate of 10 arguments

```
include('Axioms/CSR003+1.ax')
```

```

s__instance(s__testPred44_1_M, s__Predicate)    fof(local1, axiom)
s__valence(s__testPred44_1_M, n10)             fof(local2, axiom)
s__domain(s__testPred44_1_M, n1, s__Entity)    fof(local3, axiom)
s__domain(s__testPred44_1_M, n2, s__Entity)    fof(local4, axiom)
s__domain(s__testPred44_1_M, n3, s__Entity)    fof(local5, axiom)
s__domain(s__testPred44_1_M, n4, s__Entity)    fof(local6, axiom)
s__domain(s__testPred44_1_M, n5, s__Entity)    fof(local7, axiom)
s__domain(s__testPred44_1_M, n6, s__Entity)    fof(local8, axiom)
s__domain(s__testPred44_1_M, n7, s__Entity)    fof(local9, axiom)
s__domain(s__testPred44_1_M, n8, s__Entity)    fof(local10, axiom)
s__domain(s__testPred44_1_M, n9, s__Entity)    fof(local11, axiom)
s__domain(s__testPred44_1_M, n10, s__Entity)    fof(local12, axiom)
s__instance(s__Entity44_1, s__Entity)          fof(local13, axiom)
s__instance(s__Entity44_2, s__Entity)          fof(local14, axiom)
s__instance(s__Entity44_3, s__Entity)          fof(local15, axiom)
s__instance(s__Entity44_4, s__Entity)          fof(local16, axiom)
s__instance(s__Entity44_5, s__Entity)          fof(local17, axiom)
s__instance(s__Entity44_6, s__Entity)          fof(local18, axiom)
s__instance(s__Entity44_7, s__Entity)          fof(local19, axiom)
s__instance(s__Entity44_8, s__Entity)          fof(local20, axiom)
s__instance(s__Entity44_9, s__Entity)          fof(local21, axiom)
s__instance(s__Entity44_10, s__Entity)         fof(local22, axiom)
s__testPred44_1_10(s__Entity44_1, s__Entity44_2, s__Entity44_3, s__Entity44_4, s__Entity44_5, s__Entity44_6, s__Entity44_7, s__Entity44_8,
∀v_ARG1, v_ARG2, v_ARG3, v_ARG4, v_ARG5, v_ARG6, v_ARG7, v_ARG8, v_ARG9, v_ARG10: (s__testPred44_1_10(v_ARG1, v
(s__instance(v_ARG1, s__Amphibian) and s__instance(v_ARG2, s__Bird) and s__instance(v_ARG9, s__Mammal) and s__instance
s__instance(s__Entity44_1, s__Animal) and s__instance(s__Entity44_2, s__Animal) and s__instance(s__Entity44_9, s__Animal) and s

```

CSR108+6.p Defines a new predicate of 10 arguments

```
include('Axioms/CSR003+2.ax')
```

```

s__instance(s__testPred44_1_M, s__Predicate)    fof(local1, axiom)
s__valence(s__testPred44_1_M, n10)             fof(local2, axiom)
s__domain(s__testPred44_1_M, n1, s__Entity)    fof(local3, axiom)
s__domain(s__testPred44_1_M, n2, s__Entity)    fof(local4, axiom)

```

```

s__domain(s__testPred44.1_M, n3, s__Entity)    fof(local5, axiom)
s__domain(s__testPred44.1_M, n4, s__Entity)    fof(local6, axiom)
s__domain(s__testPred44.1_M, n5, s__Entity)    fof(local7, axiom)
s__domain(s__testPred44.1_M, n6, s__Entity)    fof(local8, axiom)
s__domain(s__testPred44.1_M, n7, s__Entity)    fof(local9, axiom)
s__domain(s__testPred44.1_M, n8, s__Entity)    fof(local10, axiom)
s__domain(s__testPred44.1_M, n9, s__Entity)    fof(local11, axiom)
s__domain(s__testPred44.1_M, n10, s__Entity)    fof(local12, axiom)
s__instance(s__Entity44_1, s__Entity)          fof(local13, axiom)
s__instance(s__Entity44_2, s__Entity)          fof(local14, axiom)
s__instance(s__Entity44_3, s__Entity)          fof(local15, axiom)
s__instance(s__Entity44_4, s__Entity)          fof(local16, axiom)
s__instance(s__Entity44_5, s__Entity)          fof(local17, axiom)
s__instance(s__Entity44_6, s__Entity)          fof(local18, axiom)
s__instance(s__Entity44_7, s__Entity)          fof(local19, axiom)
s__instance(s__Entity44_8, s__Entity)          fof(local20, axiom)
s__instance(s__Entity44_9, s__Entity)          fof(local21, axiom)
s__instance(s__Entity44_10, s__Entity)          fof(local22, axiom)
s__testPred44.1_10(s__Entity44_1, s__Entity44_2, s__Entity44_3, s__Entity44_4, s__Entity44_5, s__Entity44_6, s__Entity44_7, s__Entity44_8,
∀v_ARG1, v_ARG2, v_ARG3, v_ARG4, v_ARG5, v_ARG6, v_ARG7, v_ARG8, v_ARG9, v_ARG10: (s__testPred44.1_10(v_ARG1, v
(s__instance(v_ARG1, s__Amphibian) and s__instance(v_ARG2, s__Bird) and s__instance(v_ARG9, s__Mammal) and s__instance
s__instance(s__Entity44_1, s__Animal) and s__instance(s__Entity44_2, s__Animal) and s__instance(s__Entity44_9, s__Animal) and s

```

CSR108+7.p Defines a new predicate of 10 arguments

```

include('Axioms/CSR003+2.ax')
s__instance(s__testPred44.1_M, s__Predicate)    fof(local1, axiom)
s__valence(s__testPred44.1_M, n10)             fof(local2, axiom)
s__domain(s__testPred44.1_M, n1, s__Entity)    fof(local3, axiom)
s__domain(s__testPred44.1_M, n2, s__Entity)    fof(local4, axiom)
s__domain(s__testPred44.1_M, n3, s__Entity)    fof(local5, axiom)
s__domain(s__testPred44.1_M, n4, s__Entity)    fof(local6, axiom)
s__domain(s__testPred44.1_M, n5, s__Entity)    fof(local7, axiom)
s__domain(s__testPred44.1_M, n6, s__Entity)    fof(local8, axiom)
s__domain(s__testPred44.1_M, n7, s__Entity)    fof(local9, axiom)
s__domain(s__testPred44.1_M, n8, s__Entity)    fof(local10, axiom)
s__domain(s__testPred44.1_M, n9, s__Entity)    fof(local11, axiom)
s__domain(s__testPred44.1_M, n10, s__Entity)    fof(local12, axiom)
s__instance(s__Entity44_1, s__Entity)          fof(local13, axiom)
s__instance(s__Entity44_2, s__Entity)          fof(local14, axiom)
s__instance(s__Entity44_3, s__Entity)          fof(local15, axiom)
s__instance(s__Entity44_4, s__Entity)          fof(local16, axiom)
s__instance(s__Entity44_5, s__Entity)          fof(local17, axiom)
s__instance(s__Entity44_6, s__Entity)          fof(local18, axiom)
s__instance(s__Entity44_7, s__Entity)          fof(local19, axiom)
s__instance(s__Entity44_8, s__Entity)          fof(local20, axiom)
s__instance(s__Entity44_9, s__Entity)          fof(local21, axiom)
s__instance(s__Entity44_10, s__Entity)          fof(local22, axiom)
s__testPred44.1_10(s__Entity44_1, s__Entity44_2, s__Entity44_3, s__Entity44_4, s__Entity44_5, s__Entity44_6, s__Entity44_7, s__Entity44_8,
∀v_ARG1, v_ARG2, v_ARG3, v_ARG4, v_ARG5, v_ARG6, v_ARG7, v_ARG8, v_ARG9, v_ARG10: (s__testPred44.1_10(v_ARG1, v
(s__instance(v_ARG1, s__Amphibian) and s__instance(v_ARG2, s__Bird) and s__instance(v_ARG9, s__Mammal) and s__instance
∃x_s__Animal: (s__instance(s__Entity44_1, x_s__Animal) and s__instance(s__Entity44_2, x_s__Animal) and s__instance(s__Entity

```

CSR109+1.p Skolemization of a deep class hierarchy, with subsumption

```

include('Axioms/CSR003+0.ax')
include('Axioms/CSR003+3.ax')
s__instance(s__Creature50_1, s__Animal)        fof(local1, axiom)
s__subclass(s__Reptile, s__Animal) ⇒ ∃v_C1, v_C2, v_C3, v_C4, v_C5, v_C6, v_C7, v_C8, v_C9, v_C10: (s__instance(v_C1, s__SetOr
s__instance(s__Creature50_1, s__Reptile)        fof(prove_from_SUMO, conjecture)

```

CSR109+2.p Skolemization of a deep class hierarchy, with subsumption

```

include('Axioms/CSR003+1.ax')

```



```
include('Axioms/CSR003+4.ax')
s__instance(s__Creature501, s__Animal)    fof(local1, axiom)
s__subclass(s__Reptile, s__Animal) => ∃v_C1, v_C2, v_C3, v_C4, v_C5, v_C6, v_C7, v_C8, v_C9, v_C10: (s__instance(v_C1, s__SetOr)
s__instance(s__Creature501, s__Reptile)    fof(prove_from_SUMO_MILO, conjecture)
```

CSR109+3.p Skolemization of a deep class hierarchy, with subsumption

```
include('Axioms/CSR003+2.ax')
include('Axioms/CSR003+5.ax')
s__instance(s__Creature501, s__Animal)    fof(local1, axiom)
s__subclass(s__Reptile, s__Animal) => ∃v_C1, v_C2, v_C3, v_C4, v_C5, v_C6, v_C7, v_C8, v_C9, v_C10: (s__instance(v_C1, s__SetOr)
s__instance(s__Creature501, s__Reptile)    fof(prove_from_SUMO_MILO, conjecture)
```

CSR109+4.p Skolemization of a deep class hierarchy, with subsumption

```
include('Axioms/CSR003+0.ax')
s__instance(s__Creature501, s__Animal)    fof(local1, axiom)
s__subclass(s__Reptile, s__Animal) => ∃v_C1, v_C2, v_C3, v_C4, v_C5, v_C6, v_C7, v_C8, v_C9, v_C10: (s__instance(v_C1, s__SetOr)
s__instance(s__Creature501, s__Reptile)    fof(prove_from_SUMO, conjecture)
```

CSR109+5.p Skolemization of a deep class hierarchy, with subsumption

```
include('Axioms/CSR003+1.ax')
s__instance(s__Creature501, s__Animal)    fof(local1, axiom)
s__subclass(s__Reptile, s__Animal) => ∃v_C1, v_C2, v_C3, v_C4, v_C5, v_C6, v_C7, v_C8, v_C9, v_C10: (s__instance(v_C1, s__SetOr)
s__instance(s__Creature501, s__Reptile)    fof(prove_from_SUMO_MILO, conjecture)
```

CSR109+6.p Skolemization of a deep class hierarchy, with subsumption

```
include('Axioms/CSR003+2.ax')
s__instance(s__Creature501, s__Animal)    fof(local1, axiom)
s__subclass(s__Reptile, s__Animal) => ∃v_C1, v_C2, v_C3, v_C4, v_C5, v_C6, v_C7, v_C8, v_C9, v_C10: (s__instance(v_C1, s__SetOr)
s__instance(s__Creature501, s__Reptile)    fof(prove_from_SUMO_MILO, conjecture)
```

CSR109+7.p Skolemization of a deep class hierarchy, with subsumption

```
include('Axioms/CSR003+2.ax')
s__instance(s__Creature501, s__Animal)    fof(local1, axiom)
s__subclass(s__Reptile, s__Animal) => ∃v_C1, v_C2, v_C3, v_C4, v_C5, v_C6, v_C7, v_C8, v_C9, v_C10: (s__instance(v_C1, s__SetOr)
∃x_s__Creature501: s__instance(x_s__Creature501, s__Reptile)    fof(prove_from_SUMO_MILO, conjecture)
```

CSR110+1.p The SUMO axioms

```
include('Axioms/CSR003+0.ax')
```

CSR110+2.p The SUMO+MILO axioms

```
include('Axioms/CSR003+1.ax')
```

CSR110+3.p The SUMO+MILO+domain axioms

```
include('Axioms/CSR003+2.ax')
```

CSR111+2.p 1131 axioms from Cyc

```
include('Axioms/CSR002+1.ax')
```

CSR111+3.p 8005 axioms from Cyc

```
include('Axioms/CSR002+2.ax')
```

CSR111+4.p 44216 axioms from Cyc

```
include('Axioms/CSR002+3.ax')
```

CSR111+5.p 540294 axioms from Cyc

```
include('Axioms/CSR002+4.ax')
```

CSR111+6.p 3342447 axioms from Cyc

```
include('Axioms/CSR002+5.ax')
```

CSR114+21.p In which Italian city can you find the Colosseum?

```
include('Axioms/CSR004+0.ax')
∃x0, x1, x2, x3, x4: (in(x2, x0) and attr(x0, x1) and loc(x4, x2) and scar(x4, x3) and sub(x1, name_11) and sub(x0, stadt_11) and
attr(c12, c13) and sub(c12, stadt_11) and sub(c13, name_11) and val(c13, rom0) and aff(c19, c5) and subs(c19, restaurieren_11) and
```

CSR114+27.p In which Italian city can you find the Colosseum?

```
include('Axioms/CSR004+0.ax')
∃x0, x1, x2, x3, x4: (in(x2, x0) and attr(x0, x1) and loc(x4, x2) and scar(x4, x3) and sub(x1, name_11) and sub(x0, stadt_11) and
obj(c16, c21) and subs(c16, aufnehmen_11) and loc(c21, c35) and sub(c21, konzert_11) and loc(c25, c34) and sub(c25, kolosseum_11) and
```

CSR114+6.p In which Italian city can you find the Colosseum?

include('Axioms/CSR004+0.ax')

$\exists x_0, x_1: \text{attr}(x_0, x_1) \quad \text{fof}(\text{synth_qa07_004_mira_news}_{526}, \text{conjecture})$

$\text{attr}(c_5, c_6) \text{ and } \text{attr}(c_5, c_7) \text{ and } \text{sub}(c_6, \text{tag_1}_1) \text{ and } \text{val}(c_6, c_3) \text{ and } \text{sub}(c_7, \text{monat_1}_1) \text{ and } \text{val}(c_7, c_4) \text{ and } \text{sort}(c_5, t) \text{ and } \text{card}(c_5, t)$

CSR114+8.p In which Italian city can you find the Colosseum?

include('Axioms/CSR004+0.ax')

$\exists x_0, x_1, x_2, x_3: (\text{attr}(x_0, x_1) \text{ and } \text{scar}(x_3, x_2) \text{ and } \text{sub}(x_1, \text{name_1}_1) \text{ and } \text{sub}(x_0, \text{stadt_1}_1) \text{ and } \text{val}(x_1, \text{rom}_0)) \quad \text{fof}(\text{synth_qa07_004_mira_news}_{526}, \text{conjecture})$

$\text{attr}(c_{11}, c_{12}) \text{ and } \text{sub}(c_{11}, \text{stadt_1}_1) \text{ and } \text{sub}(c_{12}, \text{name_1}_1) \text{ and } \text{val}(c_{12}, \text{rom}_0) \text{ and } \text{attr}(c_{18}, c_{19}) \text{ and } \text{attr}(c_{18}, c_{20}) \text{ and } \text{sub}(c_{18}, c_{19})$

CSR115+28.p Which British company was taken over by BMW in 1994?

include('Axioms/CSR004+0.ax')

$\exists x_0, x_1, x_2, x_3, x_4, x_5: (\text{attr}(x_2, x_1) \text{ and } \text{attr}(x_4, x_5) \text{ and } \text{obj}(x_3, x_0) \text{ and } \text{sub}(x_1, \text{name_1}_1)) \quad \text{fof}(\text{synth_qa07_007_mira_news}_{1087}, \text{conjecture})$

$\text{attr}(c_{15}, c_{16}) \text{ and } \text{sub}(c_{15}, \text{stadt_1}_1) \text{ and } \text{sub}(c_{16}, \text{name_1}_1) \text{ and } \text{val}(c_{16}, \text{genf}_0) \text{ and } \text{attr}(c_{22}, c_{23}) \text{ and } \text{attr}(c_{22}, c_{24}) \text{ and } \text{sub}(c_{22}, c_{23})$

CSR115+29.p Which British company was taken over by BMW in 1994?

include('Axioms/CSR004+0.ax')

$\exists x_0, x_1, x_2, x_3, x_4, x_5, x_6: (\text{attr}(x_0, x_1) \text{ and } \text{attr}(x_3, x_2) \text{ and } \text{attr}(x_5, x_6) \text{ and } \text{obj}(x_4, x_0) \text{ and } \text{sub}(x_1, \text{name_1}_1) \text{ and } \text{sub}(x_2, \text{name_1}_1)) \quad \text{fof}(\text{synth_qa07_007_mira_news}_{1087}, \text{conjecture})$

$\text{attr}(c_{15}, c_{16}) \text{ and } \text{sub}(c_{15}, \text{stadt_1}_1) \text{ and } \text{sub}(c_{16}, \text{name_1}_1) \text{ and } \text{val}(c_{16}, \text{genf}_0) \text{ and } \text{attr}(c_{22}, c_{23}) \text{ and } \text{attr}(c_{22}, c_{24}) \text{ and } \text{sub}(c_{22}, c_{23})$

CSR115+4.p Which British company was taken over by BMW in 1994?

include('Axioms/CSR004+0.ax')

$\exists x_0, x_1: \text{obj}(x_1, x_0) \quad \text{fof}(\text{synth_qa07_007_mira_news}_{1087}, \text{conjecture})$

$\text{sub}(c_{2383}, \text{mark_1}_1) \text{ and } \text{sub}(c_{2403}, \text{beitrag_1}_1) \text{ and } \text{quant_p}_3(c_{2409}, c_{2406}, \text{million_1}_1) \text{ and } \text{tupl_p}_4(c_{2590}, c_{2383}, c_{2403}, c_{2409}) \text{ and } \text{sub}(c_{2383}, \text{mark_1}_1)$

CSR115+70.p Which British company was taken over by BMW in 1994?

include('Axioms/CSR004+0.ax')

$\exists x_0, x_1, x_2, x_3, x_4, x_5, x_6: (\text{attr}(x_0, x_1) \text{ and } \text{attr}(x_3, x_2) \text{ and } \text{attr}(x_5, x_6) \text{ and } \text{obj}(x_4, x_0) \text{ and } \text{sub}(x_1, \text{name_1}_1) \text{ and } \text{sub}(x_0, \text{firm}_0)) \quad \text{fof}(\text{synth_qa07_007_mira_news}_{1087}, \text{conjecture})$

$\text{arg}_1(c_{11}, c_3) \text{ and } \text{arg}_2(c_{11}, c_{25}) \text{ and } \text{subs}(c_{11}, \text{behandeln_1}_1) \text{ and } \text{sub}(c_{25}, \text{geschichte_1}_1) \text{ and } \text{mcont}(c_3, c_{25}) \text{ and } \text{atth}(c_{40}, c_{25})$

CSR115+92.p Which British company was taken over by BMW in 1994?

include('Axioms/CSR004+0.ax')

$\exists x_0, x_1, x_2, x_3, x_4, x_5, x_6: (\text{attr}(x_0, x_1) \text{ and } \text{attr}(x_3, x_2) \text{ and } \text{attr}(x_5, x_6) \text{ and } \text{obj}(x_4, x_0) \text{ and } \text{sub}(x_1, \text{name_1}_1) \text{ and } \text{sub}(x_0, \text{firm}_0)) \quad \text{fof}(\text{synth_qa07_007_mira_news}_{1087}, \text{conjecture})$

$\text{attr}(c_{17728}, c_{17729}) \text{ and } \text{attr}(c_{17728}, c_{17760}) \text{ and } \text{sub}(c_{17728}, \text{firma_1}_1) \text{ and } \text{sub}(c_{17729}, \text{name_1}_1) \text{ and } \text{val}(c_{17729}, \text{bmw}_0) \text{ and } \text{sub}(c_{17728}, \text{firma_1}_1)$

CSR116+30.p Who was the first black president elected in South Africa?

include('Axioms/CSR004+0.ax')

$\exists x_0, x_1, x_2, x_3, x_4, x_5, x_6, x_7, x_8: (\text{arg}_1(x_3, x_0) \text{ and } \text{arg}_2(x_3, x_4) \text{ and } \text{attr}(x_0, x_1) \text{ and } \text{attr}(x_0, x_2) \text{ and } \text{attr}(x_5, x_6) \text{ and } \text{obj}(x_7, x_0)) \quad \text{fof}(\text{synth_qa07_007_mira_news}_{1087}, \text{conjecture})$

$\text{attr}(c_{11}, c_{12}) \text{ and } \text{sub}(c_{11}, \text{stadt_1}_1) \text{ and } \text{sub}(c_{12}, \text{name_1}_1) \text{ and } \text{val}(c_{12}, \text{maputo}_0) \text{ and } \text{attr}(c_{18}, c_{19}) \text{ and } \text{attr}(c_{18}, c_{20}) \text{ and } \text{sub}(c_{18}, c_{19})$

CSR118+1.p Abraham Lincoln is a mammal

include('Axioms/CSR003+0.ax')

include('Axioms/CSR003+3.ax')

$\text{s_instance}(\text{s_AbrahamLincoln}, \text{s_Human}) \quad \text{fof}(\text{abe_human}, \text{axiom})$

$\text{s_instance}(\text{s_AbrahamLincoln}, \text{s_Mammal}) \quad \text{fof}(\text{abe_mammal}, \text{conjecture})$

CSR118+2.p Abraham Lincoln is a mammal

include('Axioms/CSR003+1.ax')

include('Axioms/CSR003+4.ax')

$\text{s_instance}(\text{s_AbrahamLincoln}, \text{s_Human}) \quad \text{fof}(\text{abe_human}, \text{axiom})$

$\text{s_instance}(\text{s_AbrahamLincoln}, \text{s_Mammal}) \quad \text{fof}(\text{abe_mammal}, \text{conjecture})$

CSR118+3.p Abraham Lincoln is a mammal

include('Axioms/CSR003+2.ax')

include('Axioms/CSR003+5.ax')

$\text{s_instance}(\text{s_AbrahamLincoln}, \text{s_Human}) \quad \text{fof}(\text{abe_human}, \text{axiom})$

$\text{s_instance}(\text{s_AbrahamLincoln}, \text{s_Mammal}) \quad \text{fof}(\text{abe_mammal}, \text{conjecture})$

CSR118+4.p Abraham Lincoln is a mammal

include('Axioms/CSR003+0.ax')

$\text{s_instance}(\text{s_AbrahamLincoln}, \text{s_Human}) \quad \text{fof}(\text{abe_human}, \text{axiom})$

$\text{s_instance}(\text{s_AbrahamLincoln}, \text{s_Mammal}) \quad \text{fof}(\text{abe_mammal}, \text{conjecture})$

CSR118+5.p Abraham Lincoln is a mammal

include('Axioms/CSR003+1.ax')

$\text{s_instance}(\text{s_AbrahamLincoln}, \text{s_Human}) \quad \text{fof}(\text{abe_human}, \text{axiom})$

$\text{s_instance}(\text{s_AbrahamLincoln}, \text{s_Mammal}) \quad \text{fof}(\text{abe_mammal}, \text{conjecture})$

CSR118+6.p Abraham Lincoln is a mammal

```
include('Axioms/CSR003+2.ax')
s__instance(s__AbrahamLincoln, s__Human)    fof(abe_human, axiom)
s__instance(s__AbrahamLincoln, s__Mammal)    fof(abe_mammal, conjecture)
```

CSR118+7.p Abraham Lincoln is a mammal

```
include('Axioms/CSR003+2.ax')
s__instance(s__AbrahamLincoln, s__Human)    fof(abe_human, axiom)
∃x_s__AbrahamLincoln: s__instance(x_s__AbrahamLincoln, s__Mammal)    fof(abe_mammal, conjecture)
```

CSR119^1.p Did someone like Bill in 2009?

During 2009 Mary liked Bill and Sue liked Bill. Is it the case that someone liked Bill during 2009?

```
num: $tType    thf(numbers, type)
holdsDuring_THFTYPE_IiooI: $i → $o → $o    thf(holdsDuring_THFTYPE_IiooI, type)
lBill_THFTYPE_i: $i    thf(lBill_THFTYPE_i, type)
lMary_THFTYPE_i: $i    thf(lMary_THFTYPE_i, type)
lSue_THFTYPE_i: $i    thf(lSue_THFTYPE_i, type)
lYearFn_THFTYPE_IiiiI: $i → $i    thf(lYearFn_THFTYPE_IiiiI, type)
likes_THFTYPE_IiooI: $i → $i → $o    thf(likes_THFTYPE_IiooI, type)
n2009_THFTYPE_i: $i    thf(n2009_THFTYPE_i, type)
holdsDuring_THFTYPE_IiooI@(lYearFn_THFTYPE_IiiiI@n2009_THFTYPE_i)@(likes_THFTYPE_IiooI@lMary_THFTYPE_i)
∃y: $i: (holdsDuring_THFTYPE_IiooI@(lYearFn_THFTYPE_IiiiI@n2009_THFTYPE_i)@(likes_THFTYPE_IiooI@y@lBill_THFTYPE_i))
```

CSR119^3.p Did someone like Bill in 2009?

During 2009 Mary liked Bill and Sue liked Bill. Is it the case that someone liked Bill during 2009?

```
include('Axioms/CSR005^0.ax')
lBill_THFTYPE_i: $i    thf(lBill_THFTYPE_i, type)
lMary_THFTYPE_i: $i    thf(lMary_THFTYPE_i, type)
lSue_THFTYPE_i: $i    thf(lSue_THFTYPE_i, type)
likes_THFTYPE_IiooI: $i → $i → $o    thf(likes_THFTYPE_IiooI, type)
n2009_THFTYPE_i: $i    thf(n2009_THFTYPE_i, type)
holdsDuring_THFTYPE_IiooI@(lYearFn_THFTYPE_IiiiI@n2009_THFTYPE_i)@(likes_THFTYPE_IiooI@lMary_THFTYPE_i)
∃y: $i: (holdsDuring_THFTYPE_IiooI@(lYearFn_THFTYPE_IiiiI@n2009_THFTYPE_i)@(likes_THFTYPE_IiooI@y@lBill_THFTYPE_i))
```

CSR120^1.p Did someone like Bill in 2009?

During 2009 Mary liked Bill and Sue liked Bill (formulated via de-Morgan rule instead of a simply using and). Is it the case that someone liked Bill during 2009?

```
num: $tType    thf(numbers, type)
holdsDuring_THFTYPE_IiooI: $i → $o → $o    thf(holdsDuring_THFTYPE_IiooI, type)
lBill_THFTYPE_i: $i    thf(lBill_THFTYPE_i, type)
lMary_THFTYPE_i: $i    thf(lMary_THFTYPE_i, type)
lSue_THFTYPE_i: $i    thf(lSue_THFTYPE_i, type)
lYearFn_THFTYPE_IiiiI: $i → $i    thf(lYearFn_THFTYPE_IiiiI, type)
likes_THFTYPE_IiooI: $i → $i → $o    thf(likes_THFTYPE_IiooI, type)
n2009_THFTYPE_i: $i    thf(n2009_THFTYPE_i, type)
holdsDuring_THFTYPE_IiooI@(lYearFn_THFTYPE_IiiiI@n2009_THFTYPE_i)@(¬@¬@(likes_THFTYPE_IiooI@lMary_THFTYPE_i)
∃y: $i: (holdsDuring_THFTYPE_IiooI@(lYearFn_THFTYPE_IiiiI@n2009_THFTYPE_i)@(likes_THFTYPE_IiooI@y@lBill_THFTYPE_i))
```

CSR120^3.p Did someone like Bill in 2009?

During 2009 Mary liked Bill and Sue liked Bill. Is it the case that someone liked Bill during 2009?

```
include('Axioms/CSR005^0.ax')
lBill_THFTYPE_i: $i    thf(lBill_THFTYPE_i, type)
lMary_THFTYPE_i: $i    thf(lMary_THFTYPE_i, type)
lSue_THFTYPE_i: $i    thf(lSue_THFTYPE_i, type)
likes_THFTYPE_IiooI: $i → $i → $o    thf(likes_THFTYPE_IiooI, type)
n2009_THFTYPE_i: $i    thf(n2009_THFTYPE_i, type)
holdsDuring_THFTYPE_IiooI@(lYearFn_THFTYPE_IiiiI@n2009_THFTYPE_i)@(¬@¬@(likes_THFTYPE_IiooI@lMary_THFTYPE_i)
∃x: $i: (holdsDuring_THFTYPE_IiooI@(lYearFn_THFTYPE_IiiiI@n2009_THFTYPE_i)@(likes_THFTYPE_IiooI@x@lBill_THFTYPE_i))
```

CSR121^1.p Did Mary and Sue like someone in 2009?

During 2009 Mary liked Bill and Sue liked Bill (formulated via de-Morgan rule instead of a simply using and). Does someone exist who was liked by Mary and Sue during 2009?

```
num: $tType    thf(numbers, type)
```

$\text{holdsDuring_THFTYPE_IiooI}: \$i \rightarrow \$o \rightarrow \$o \quad \text{thf}(\text{holdsDuring_THFTYPE_IiooI}, \text{type})$
 $\text{lBill_THFTYPE_i}: \$i \quad \text{thf}(\text{lBill_THFTYPE_i}, \text{type})$
 $\text{lMary_THFTYPE_i}: \$i \quad \text{thf}(\text{lMary_THFTYPE_i}, \text{type})$
 $\text{lSue_THFTYPE_i}: \$i \quad \text{thf}(\text{lSue_THFTYPE_i}, \text{type})$
 $\text{lYearFn_THFTYPE_IiiI}: \$i \rightarrow \$i \quad \text{thf}(\text{lYearFn_THFTYPE_IiiI}, \text{type})$
 $\text{likes_THFTYPE_IiooI}: \$i \rightarrow \$i \rightarrow \$o \quad \text{thf}(\text{likes_THFTYPE_IiooI}, \text{type})$
 $\text{n2009_THFTYPE_i}: \$i \quad \text{thf}(\text{n2009_THFTYPE_i}, \text{type})$
 $\text{holdsDuring_THFTYPE_IiooI} @ (\text{lYearFn_THFTYPE_IiiI} @ \text{n2009_THFTYPE_i}) @ (\neg @ (\neg @ (\text{likes_THFTYPE_IiooI} @ \text{lMary_THFTYPE_i}) @ \text{lSue_THFTYPE_i})) @ \text{lBill_THFTYPE_i}$
 $\exists x: \$i: (\text{holdsDuring_THFTYPE_IiooI} @ (\text{lYearFn_THFTYPE_IiiI} @ \text{n2009_THFTYPE_i}) @ (\text{likes_THFTYPE_IiooI} @ \text{lMary_THFTYPE_i})) @ x$

CSR122 \wedge **1.p** Do Mary and Sue like Bill in 2009?

Mary likes Bill and Sue likes Bill. Does this also hold during year 2009? In order to make this statement provable we assume that 'True' holds during each time context.

$\text{num}: \$t\text{Type} \quad \text{thf}(\text{numbers}, \text{type})$
 $\text{holdsDuring_THFTYPE_IiooI}: \$i \rightarrow \$o \rightarrow \$o \quad \text{thf}(\text{holdsDuring_THFTYPE_IiooI}, \text{type})$
 $\text{lBill_THFTYPE_i}: \$i \quad \text{thf}(\text{lBill_THFTYPE_i}, \text{type})$
 $\text{lMary_THFTYPE_i}: \$i \quad \text{thf}(\text{lMary_THFTYPE_i}, \text{type})$
 $\text{lSue_THFTYPE_i}: \$i \quad \text{thf}(\text{lSue_THFTYPE_i}, \text{type})$
 $\text{lYearFn_THFTYPE_IiiI}: \$i \rightarrow \$i \quad \text{thf}(\text{lYearFn_THFTYPE_IiiI}, \text{type})$
 $\text{likes_THFTYPE_IiooI}: \$i \rightarrow \$i \rightarrow \$o \quad \text{thf}(\text{likes_THFTYPE_IiooI}, \text{type})$
 $\text{n2009_THFTYPE_i}: \$i \quad \text{thf}(\text{n2009_THFTYPE_i}, \text{type})$
 $\text{likes_THFTYPE_IiooI} @ \text{lSue_THFTYPE_i} @ \text{lBill_THFTYPE_i} \quad \text{thf}(\text{ax}, \text{axiom})$
 $\text{likes_THFTYPE_IiooI} @ \text{lMary_THFTYPE_i} @ \text{lBill_THFTYPE_i} \quad \text{thf}(\text{ax}_{001}, \text{axiom})$
 $\forall x: \$i: (\text{holdsDuring_THFTYPE_IiooI} @ x @ \$\text{true}) \quad \text{thf}(\text{ax}_{002}, \text{axiom})$
 $\text{holdsDuring_THFTYPE_IiooI} @ (\text{lYearFn_THFTYPE_IiiI} @ \text{n2009_THFTYPE_i}) @ (\text{likes_THFTYPE_IiooI} @ \text{lMary_THFTYPE_i}) @ \text{lSue_THFTYPE_i}$

CSR123 \wedge **1.p** What does Sue feel?

Mary likes Bill and Sue likes Bill. During 2009 Sue did not like Ben. Are there a relation ?P and persons ?X and ?Y, so that during the year 2009 ?P holds for Sue and ?X but ?P does not hold for Sue and ?Y.

$\text{num}: \$t\text{Type} \quad \text{thf}(\text{numbers}, \text{type})$
 $\text{holdsDuring_THFTYPE_IiooI}: \$i \rightarrow \$o \rightarrow \$o \quad \text{thf}(\text{holdsDuring_THFTYPE_IiooI}, \text{type})$
 $\text{lBen_THFTYPE_i}: \$i \quad \text{thf}(\text{lBen_THFTYPE_i}, \text{type})$
 $\text{lBill_THFTYPE_i}: \$i \quad \text{thf}(\text{lBill_THFTYPE_i}, \text{type})$
 $\text{lMary_THFTYPE_i}: \$i \quad \text{thf}(\text{lMary_THFTYPE_i}, \text{type})$
 $\text{lSue_THFTYPE_i}: \$i \quad \text{thf}(\text{lSue_THFTYPE_i}, \text{type})$
 $\text{lYearFn_THFTYPE_IiiI}: \$i \rightarrow \$i \quad \text{thf}(\text{lYearFn_THFTYPE_IiiI}, \text{type})$
 $\text{likes_THFTYPE_IiooI}: \$i \rightarrow \$i \rightarrow \$o \quad \text{thf}(\text{likes_THFTYPE_IiooI}, \text{type})$
 $\text{n2009_THFTYPE_i}: \$i \quad \text{thf}(\text{n2009_THFTYPE_i}, \text{type})$
 $\text{likes_THFTYPE_IiooI} @ \text{lSue_THFTYPE_i} @ \text{lBill_THFTYPE_i} \quad \text{thf}(\text{ax}, \text{axiom})$
 $\text{likes_THFTYPE_IiooI} @ \text{lMary_THFTYPE_i} @ \text{lBill_THFTYPE_i} \quad \text{thf}(\text{ax}_{001}, \text{axiom})$
 $\text{holdsDuring_THFTYPE_IiooI} @ (\text{lYearFn_THFTYPE_IiiI} @ \text{n2009_THFTYPE_i}) @ (\neg @ (\text{likes_THFTYPE_IiooI} @ \text{lSue_THFTYPE_i}) @ \text{lBen_THFTYPE_i})$
 $\exists p: \$i \rightarrow \$i \rightarrow \$o, x: \$i, y: \$i: (\text{holdsDuring_THFTYPE_IiooI} @ (\text{lYearFn_THFTYPE_IiiI} @ \text{n2009_THFTYPE_i}) @ (p @ \text{lSue_THFTYPE_i})) @ x @ y$

CSR124 \wedge **1.p** Do Mary and Sue like Bill in 2009?

Mary likes Bill. During 2009 Sue likes Bill. Does it hold during year 2009 that Mary likes Bill and Sue likes Bill?

$\text{num}: \$t\text{Type} \quad \text{thf}(\text{numbers}, \text{type})$
 $\text{holdsDuring_THFTYPE_IiooI}: \$i \rightarrow \$o \rightarrow \$o \quad \text{thf}(\text{holdsDuring_THFTYPE_IiooI}, \text{type})$
 $\text{lBill_THFTYPE_i}: \$i \quad \text{thf}(\text{lBill_THFTYPE_i}, \text{type})$
 $\text{lMary_THFTYPE_i}: \$i \quad \text{thf}(\text{lMary_THFTYPE_i}, \text{type})$
 $\text{lSue_THFTYPE_i}: \$i \quad \text{thf}(\text{lSue_THFTYPE_i}, \text{type})$
 $\text{lYearFn_THFTYPE_IiiI}: \$i \rightarrow \$i \quad \text{thf}(\text{lYearFn_THFTYPE_IiiI}, \text{type})$
 $\text{likes_THFTYPE_IiooI}: \$i \rightarrow \$i \rightarrow \$o \quad \text{thf}(\text{likes_THFTYPE_IiooI}, \text{type})$
 $\text{n2009_THFTYPE_i}: \$i \quad \text{thf}(\text{n2009_THFTYPE_i}, \text{type})$
 $\text{likes_THFTYPE_IiooI} @ \text{lMary_THFTYPE_i} @ \text{lBill_THFTYPE_i} \quad \text{thf}(\text{ax}, \text{axiom})$
 $\text{holdsDuring_THFTYPE_IiooI} @ (\text{lYearFn_THFTYPE_IiiI} @ \text{n2009_THFTYPE_i}) @ (\text{likes_THFTYPE_IiooI} @ \text{lSue_THFTYPE_i}) @ \text{lBill_THFTYPE_i}$
 $\text{holdsDuring_THFTYPE_IiooI} @ (\text{lYearFn_THFTYPE_IiiI} @ \text{n2009_THFTYPE_i}) @ (\text{likes_THFTYPE_IiooI} @ \text{lMary_THFTYPE_i}) @ \text{lBill_THFTYPE_i}$

CSR125 \wedge **1.p** Sue contradicts her likes

Mary likes Bill and Sue likes Bill. During 2009 Sue didn't like anybody. During year 2009 we get a contradiction.

$\text{num}: \$t\text{Type} \quad \text{thf}(\text{numbers}, \text{type})$
 $\text{holdsDuring_THFTYPE_IiooI}: \$i \rightarrow \$o \rightarrow \$o \quad \text{thf}(\text{holdsDuring_THFTYPE_IiooI}, \text{type})$

$\text{lBill_THFTYPE_i: } \$i \quad \text{thf}(\text{lBill_THFTYPE_i, type})$
 $\text{lMary_THFTYPE_i: } \$i \quad \text{thf}(\text{lMary_THFTYPE_i, type})$
 $\text{lSue_THFTYPE_i: } \$i \quad \text{thf}(\text{lSue_THFTYPE_i, type})$
 $\text{lYearFn_THFTYPE_IiiI: } \$i \rightarrow \$i \quad \text{thf}(\text{lYearFn_THFTYPE_IiiI, type})$
 $\text{likes_THFTYPE_IiooI: } \$i \rightarrow \$i \rightarrow \$o \quad \text{thf}(\text{likes_THFTYPE_IiooI, type})$
 $\text{n2009_THFTYPE_i: } \$i \quad \text{thf}(\text{n2009_THFTYPE_i, type})$
 $\text{likes_THFTYPE_IiooI@lSue_THFTYPE_i@lBill_THFTYPE_i} \quad \text{thf}(\text{ax, axiom})$
 $\text{likes_THFTYPE_IiooI@lMary_THFTYPE_i@lBill_THFTYPE_i} \quad \text{thf}(\text{ax}_{001}, \text{axiom})$
 $\forall x: \$i: (\text{holdsDuring_THFTYPE_IiooI} @ (\text{lYearFn_THFTYPE_IiiI} @ \text{n2009_THFTYPE_i}) @ (\neg @ (\text{likes_THFTYPE_IiooI} @ \text{lSue_THFTYPE_i} @ x))) \quad \text{thf}(\text{con, conjecture})$
 $\text{holdsDuring_THFTYPE_IiooI} @ (\text{lYearFn_THFTYPE_IiiI} @ \text{n2009_THFTYPE_i}) @ \$\text{false} \quad \text{thf}(\text{con, conjecture})$

CSR126^{1.p} Did Sue like Bill in 2009?

Mary likes Bill during all times. During 2009, Sue liked everybody who was liked by Mary. Is it the case that during 2009 Sue liked Bill.

$\text{num: } \$t\text{Type} \quad \text{thf}(\text{numbers, type})$
 $\text{holdsDuring_THFTYPE_IiooI: } \$i \rightarrow \$o \rightarrow \$o \quad \text{thf}(\text{holdsDuring_THFTYPE_IiooI, type})$
 $\text{lBill_THFTYPE_i: } \$i \quad \text{thf}(\text{lBill_THFTYPE_i, type})$
 $\text{lMary_THFTYPE_i: } \$i \quad \text{thf}(\text{lMary_THFTYPE_i, type})$
 $\text{lSue_THFTYPE_i: } \$i \quad \text{thf}(\text{lSue_THFTYPE_i, type})$
 $\text{lYearFn_THFTYPE_IiiI: } \$i \rightarrow \$i \quad \text{thf}(\text{lYearFn_THFTYPE_IiiI, type})$
 $\text{likes_THFTYPE_IiooI: } \$i \rightarrow \$i \rightarrow \$o \quad \text{thf}(\text{likes_THFTYPE_IiooI, type})$
 $\text{n2009_THFTYPE_i: } \$i \quad \text{thf}(\text{n2009_THFTYPE_i, type})$
 $\forall t: \$i: (\text{holdsDuring_THFTYPE_IiooI} @ t @ (\text{likes_THFTYPE_IiooI} @ \text{lMary_THFTYPE_i} @ \text{lBill_THFTYPE_i})) \quad \text{thf}(\text{ax, axiom})$
 $\forall x: \$i: (\text{holdsDuring_THFTYPE_IiooI} @ (\text{lYearFn_THFTYPE_IiiI} @ \text{n2009_THFTYPE_i}) @ ((\text{likes_THFTYPE_IiooI} @ \text{lMary_THFTYPE_i} @ x) @ (\text{likes_THFTYPE_IiooI} @ \text{lSue_THFTYPE_i} @ x)))) \quad \text{thf}(\text{ax}_{001}, \text{axiom})$
 $\text{holdsDuring_THFTYPE_IiooI} @ (\text{lYearFn_THFTYPE_IiiI} @ \text{n2009_THFTYPE_i}) @ (\text{likes_THFTYPE_IiooI} @ \text{lSue_THFTYPE_i} @ x) \quad \text{thf}(\text{con, conjecture})$

CSR127^{1.p} Did someone like Bill in 2009?

Mary likes Bill. During 2009, Sue liked everybody who was liked by Mary. Is it the case that during 2009 Bill was liked by somebody?

$\text{num: } \$t\text{Type} \quad \text{thf}(\text{numbers, type})$
 $\text{holdsDuring_THFTYPE_IiooI: } \$i \rightarrow \$o \rightarrow \$o \quad \text{thf}(\text{holdsDuring_THFTYPE_IiooI, type})$
 $\text{lBill_THFTYPE_i: } \$i \quad \text{thf}(\text{lBill_THFTYPE_i, type})$
 $\text{lMary_THFTYPE_i: } \$i \quad \text{thf}(\text{lMary_THFTYPE_i, type})$
 $\text{lSue_THFTYPE_i: } \$i \quad \text{thf}(\text{lSue_THFTYPE_i, type})$
 $\text{lYearFn_THFTYPE_IiiI: } \$i \rightarrow \$i \quad \text{thf}(\text{lYearFn_THFTYPE_IiiI, type})$
 $\text{likes_THFTYPE_IiooI: } \$i \rightarrow \$i \rightarrow \$o \quad \text{thf}(\text{likes_THFTYPE_IiooI, type})$
 $\text{n2009_THFTYPE_i: } \$i \quad \text{thf}(\text{n2009_THFTYPE_i, type})$
 $\text{likes_THFTYPE_IiooI@lMary_THFTYPE_i@lBill_THFTYPE_i} \quad \text{thf}(\text{ax, axiom})$
 $\forall x: \$i: (\text{holdsDuring_THFTYPE_IiooI} @ (\text{lYearFn_THFTYPE_IiiI} @ \text{n2009_THFTYPE_i}) @ ((\text{likes_THFTYPE_IiooI} @ \text{lMary_THFTYPE_i} @ x) @ (\text{likes_THFTYPE_IiooI} @ \text{lSue_THFTYPE_i} @ x)))) \quad \text{thf}(\text{ax}_{001}, \text{axiom})$
 $\exists y: \$i: (\text{holdsDuring_THFTYPE_IiooI} @ (\text{lYearFn_THFTYPE_IiiI} @ \text{n2009_THFTYPE_i}) @ (\text{likes_THFTYPE_IiooI} @ y @ \text{lBill_THFTYPE_i})) \quad \text{thf}(\text{con, conjecture})$

CSR128^{1.p} Did Sue like someone in 2009?

During 2009, Mary likes Bill. During 2009, Sue liked everybody who was liked by Mary. Is it the case that Sue liked somebody during some time period?

$\text{num: } \$t\text{Type} \quad \text{thf}(\text{numbers, type})$
 $\text{holdsDuring_THFTYPE_IiooI: } \$i \rightarrow \$o \rightarrow \$o \quad \text{thf}(\text{holdsDuring_THFTYPE_IiooI, type})$
 $\text{lBill_THFTYPE_i: } \$i \quad \text{thf}(\text{lBill_THFTYPE_i, type})$
 $\text{lMary_THFTYPE_i: } \$i \quad \text{thf}(\text{lMary_THFTYPE_i, type})$
 $\text{lSue_THFTYPE_i: } \$i \quad \text{thf}(\text{lSue_THFTYPE_i, type})$
 $\text{lYearFn_THFTYPE_IiiI: } \$i \rightarrow \$i \quad \text{thf}(\text{lYearFn_THFTYPE_IiiI, type})$
 $\text{likes_THFTYPE_IiooI: } \$i \rightarrow \$i \rightarrow \$o \quad \text{thf}(\text{likes_THFTYPE_IiooI, type})$
 $\text{n2009_THFTYPE_i: } \$i \quad \text{thf}(\text{n2009_THFTYPE_i, type})$
 $\text{holdsDuring_THFTYPE_IiooI} @ (\text{lYearFn_THFTYPE_IiiI} @ \text{n2009_THFTYPE_i}) @ (\text{likes_THFTYPE_IiooI} @ \text{lMary_THFTYPE_i} @ x) \quad \text{thf}(\text{con, conjecture})$
 $\forall x: \$i: (\text{holdsDuring_THFTYPE_IiooI} @ (\text{lYearFn_THFTYPE_IiiI} @ \text{n2009_THFTYPE_i}) @ ((\text{likes_THFTYPE_IiooI} @ \text{lMary_THFTYPE_i} @ x) @ (\text{likes_THFTYPE_IiooI} @ \text{lSue_THFTYPE_i} @ x)))) \quad \text{thf}(\text{ax}_{001}, \text{axiom})$
 $\exists t: \$i, z: \$i: (\text{holdsDuring_THFTYPE_IiooI} @ t @ (\text{likes_THFTYPE_IiooI} @ \text{lSue_THFTYPE_i} @ z)) \quad \text{thf}(\text{con, conjecture})$

CSR129^{1.p} What do Sue and Mary feel about Bill in 2009?

In the context of year 2009: Does there exists a relation ?R that holds between Sue and Bill as well as between Mary and Bill?

```

num: $tType    thf(numbers, type)
holdsDuring_THFTYPE_IiooI: $i → $o → $o    thf(holdsDuring_THFTYPE_IiooI, type)
lAnna_THFTYPE_i: $i    thf(lAnna_THFTYPE_i, type)
lBen_THFTYPE_i: $i    thf(lBen_THFTYPE_i, type)
lBill_THFTYPE_i: $i    thf(lBill_THFTYPE_i, type)
lBob_THFTYPE_i: $i    thf(lBob_THFTYPE_i, type)
lMary_THFTYPE_i: $i    thf(lMary_THFTYPE_i, type)
lSue_THFTYPE_i: $i    thf(lSue_THFTYPE_i, type)
lYearFn_THFTYPE_IiiiI: $i → $i    thf(lYearFn_THFTYPE_IiiiI, type)
likes_THFTYPE_IiioI: $i → $i → $o    thf(likes_THFTYPE_IiioI, type)
n2009_THFTYPE_i: $i    thf(n2009_THFTYPE_i, type)
parent_THFTYPE_IiioI: $i → $i → $o    thf(parent_THFTYPE_IiioI, type)
holdsDuring_THFTYPE_IiooI@(lYearFn_THFTYPE_IiiiI@n2009_THFTYPE_i)@(parent_THFTYPE_IiioI@lMary_THFTYPE_i)
holdsDuring_THFTYPE_IiooI@(lYearFn_THFTYPE_IiiiI@n2009_THFTYPE_i)@(parent_THFTYPE_IiioI@lSue_THFTYPE_i)
holdsDuring_THFTYPE_IiooI@(lYearFn_THFTYPE_IiiiI@n2009_THFTYPE_i)@(likes_THFTYPE_IiioI@lSue_THFTYPE_i)
holdsDuring_THFTYPE_IiooI@(lYearFn_THFTYPE_IiiiI@n2009_THFTYPE_i)@(likes_THFTYPE_IiioI@lBob_THFTYPE_i)
holdsDuring_THFTYPE_IiooI@(lYearFn_THFTYPE_IiiiI@n2009_THFTYPE_i)@(likes_THFTYPE_IiioI@lMary_THFTYPE_i)
holdsDuring_THFTYPE_IiooI@(lYearFn_THFTYPE_IiiiI@n2009_THFTYPE_i)@(parent_THFTYPE_IiioI@lSue_THFTYPE_i)
holdsDuring_THFTYPE_IiooI@(lYearFn_THFTYPE_IiiiI@n2009_THFTYPE_i)@(parent_THFTYPE_IiioI@lMary_THFTYPE_i)
holdsDuring_THFTYPE_IiooI@(lYearFn_THFTYPE_IiiiI@n2009_THFTYPE_i)@(~@(likes_THFTYPE_IiioI@lSue_THFTYPE_i))
∃r: $i → $i → $o: (holdsDuring_THFTYPE_IiooI@(lYearFn_THFTYPE_IiiiI@n2009_THFTYPE_i)@(r@lSue_THFTYPE_i@lBill_THFTYPE_i))

```

CSR130^{∧1.p} In 2009, what's the common feeling between Sue and Mary, and Bill?

In the context of year 2009: Does there exists a relation ?R that holds between Sue and Bill as well as between Mary and Bill?

```

num: $tType    thf(numbers, type)
holdsDuring_THFTYPE_IiooI: $i → $o → $o    thf(holdsDuring_THFTYPE_IiooI, type)
lAnna_THFTYPE_i: $i    thf(lAnna_THFTYPE_i, type)
lBen_THFTYPE_i: $i    thf(lBen_THFTYPE_i, type)
lBill_THFTYPE_i: $i    thf(lBill_THFTYPE_i, type)
lBob_THFTYPE_i: $i    thf(lBob_THFTYPE_i, type)
lMary_THFTYPE_i: $i    thf(lMary_THFTYPE_i, type)
lSue_THFTYPE_i: $i    thf(lSue_THFTYPE_i, type)
lYearFn_THFTYPE_IiiiI: $i → $i    thf(lYearFn_THFTYPE_IiiiI, type)
likes_THFTYPE_IiioI: $i → $i → $o    thf(likes_THFTYPE_IiioI, type)
n2009_THFTYPE_i: $i    thf(n2009_THFTYPE_i, type)
parent_THFTYPE_IiioI: $i → $i → $o    thf(parent_THFTYPE_IiioI, type)
holdsDuring_THFTYPE_IiooI@(lYearFn_THFTYPE_IiiiI@n2009_THFTYPE_i)@(parent_THFTYPE_IiioI@lMary_THFTYPE_i)
holdsDuring_THFTYPE_IiooI@(lYearFn_THFTYPE_IiiiI@n2009_THFTYPE_i)@(parent_THFTYPE_IiioI@lSue_THFTYPE_i)
holdsDuring_THFTYPE_IiooI@(lYearFn_THFTYPE_IiiiI@n2009_THFTYPE_i)@(likes_THFTYPE_IiioI@lSue_THFTYPE_i)
holdsDuring_THFTYPE_IiooI@(lYearFn_THFTYPE_IiiiI@n2009_THFTYPE_i)@(likes_THFTYPE_IiioI@lBob_THFTYPE_i)
holdsDuring_THFTYPE_IiooI@(lYearFn_THFTYPE_IiiiI@n2009_THFTYPE_i)@(likes_THFTYPE_IiioI@lMary_THFTYPE_i)
holdsDuring_THFTYPE_IiooI@(lYearFn_THFTYPE_IiiiI@n2009_THFTYPE_i)@(parent_THFTYPE_IiioI@lSue_THFTYPE_i)
holdsDuring_THFTYPE_IiooI@(lYearFn_THFTYPE_IiiiI@n2009_THFTYPE_i)@(parent_THFTYPE_IiioI@lMary_THFTYPE_i)
holdsDuring_THFTYPE_IiooI@(lYearFn_THFTYPE_IiiiI@n2009_THFTYPE_i)@(~@(likes_THFTYPE_IiioI@lSue_THFTYPE_i))
∃r: $i → $i → $o: (holdsDuring_THFTYPE_IiooI@(lYearFn_THFTYPE_IiiiI@n2009_THFTYPE_i)@(r@lSue_THFTYPE_i@lBill_THFTYPE_i))

```

CSR135^{∧1.p} What's a common feeling of Sue and Mary to Bill?

Does there exists a relation ?R that holds between Sue and Bill as well as between Mary and Bill?

```

num: $tType    thf(numbers, type)
lAnna_THFTYPE_i: $i    thf(lAnna_THFTYPE_i, type)
lBen_THFTYPE_i: $i    thf(lBen_THFTYPE_i, type)
lBill_THFTYPE_i: $i    thf(lBill_THFTYPE_i, type)
lBob_THFTYPE_i: $i    thf(lBob_THFTYPE_i, type)
lMary_THFTYPE_i: $i    thf(lMary_THFTYPE_i, type)
lSue_THFTYPE_i: $i    thf(lSue_THFTYPE_i, type)
likes_THFTYPE_IiioI: $i → $i → $o    thf(likes_THFTYPE_IiioI, type)
parent_THFTYPE_IiioI: $i → $i → $o    thf(parent_THFTYPE_IiioI, type)

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$\text{likes_THFTYPE_IioI@lSue_THFTYPE_i@lBill_THFTYPE_i}$ thf(ax, axiom)
 $\neg @(\text{likes_THFTYPE_IioI@lSue_THFTYPE_i@lMary_THFTYPE_i})$ $\text{thf(ax}_{001}, \text{axiom})$
 $\text{likes_THFTYPE_IioI@lMary_THFTYPE_i@lBill_THFTYPE_i}$ $\text{thf(ax}_{002}, \text{axiom})$
 $\text{parent_THFTYPE_IioI@lMary_THFTYPE_i@lBen_THFTYPE_i}$ $\text{thf(ax}_{003}, \text{axiom})$
 $\text{parent_THFTYPE_IioI@lSue_THFTYPE_i@lBen_THFTYPE_i}$ $\text{thf(ax}_{004}, \text{axiom})$
 $\text{likes_THFTYPE_IioI@lBob_THFTYPE_i@lBill_THFTYPE_i}$ $\text{thf(ax}_{005}, \text{axiom})$
 $\text{parent_THFTYPE_IioI@lSue_THFTYPE_i@lAnna_THFTYPE_i}$ $\text{thf(ax}_{006}, \text{axiom})$
 $\text{parent_THFTYPE_IioI@lMary_THFTYPE_i@lAnna_THFTYPE_i}$ $\text{thf(ax}_{007}, \text{axiom})$
 $\exists r: \$i \rightarrow \$i \rightarrow \$o: (r@l\text{Sue_THFTYPE_i@lBill_THFTYPE_i} \text{ and } r@l\text{Mary_THFTYPE_i@lBill_THFTYPE_i})$ thf(con, conj)

CSR135^2.p What's a common feeling of Sue and Mary to Bill?

Does there exists a relation ?R that holds between Sue and Bill as well as between Mary and Bill?

$\text{num: \$tType}$ $\text{thf(numbers, type)}$
 $\text{lAnna_THFTYPE_i: \$i}$ $\text{thf(lAnna_THFTYPE_i, type)}$
 $\text{lBen_THFTYPE_i: \$i}$ $\text{thf(lBen_THFTYPE_i, type)}$
 $\text{lBill_THFTYPE_i: \$i}$ $\text{thf(lBill_THFTYPE_i, type)}$
 $\text{lBob_THFTYPE_i: \$i}$ $\text{thf(lBob_THFTYPE_i, type)}$
 $\text{lMary_THFTYPE_i: \$i}$ $\text{thf(lMary_THFTYPE_i, type)}$
 $\text{lSue_THFTYPE_i: \$i}$ $\text{thf(lSue_THFTYPE_i, type)}$
 $\text{likes_THFTYPE_IioI: \$i} \rightarrow \$i \rightarrow \o $\text{thf(likes_THFTYPE_IioI, type)}$
 $\text{parent_THFTYPE_IioI: \$i} \rightarrow \$i \rightarrow \o $\text{thf(parent_THFTYPE_IioI, type)}$
 $\text{likes_THFTYPE_IioI@lSue_THFTYPE_i@lBill_THFTYPE_i}$ thf(ax, axiom)
 $\text{likes_THFTYPE_IioI@lSue_THFTYPE_i@lBill_THFTYPE_i}$ $\text{thf(ax}_{001}, \text{axiom})$
 $\neg @(\text{likes_THFTYPE_IioI@lSue_THFTYPE_i@lMary_THFTYPE_i})$ $\text{thf(ax}_{002}, \text{axiom})$
 $\neg @(\text{likes_THFTYPE_IioI@lSue_THFTYPE_i@lMary_THFTYPE_i})$ $\text{thf(ax}_{003}, \text{axiom})$
 $\text{likes_THFTYPE_IioI@lMary_THFTYPE_i@lBill_THFTYPE_i}$ $\text{thf(ax}_{004}, \text{axiom})$
 $\text{likes_THFTYPE_IioI@lMary_THFTYPE_i@lBill_THFTYPE_i}$ $\text{thf(ax}_{005}, \text{axiom})$
 $\text{parent_THFTYPE_IioI@lMary_THFTYPE_i@lBen_THFTYPE_i}$ $\text{thf(ax}_{006}, \text{axiom})$
 $\text{parent_THFTYPE_IioI@lSue_THFTYPE_i@lBen_THFTYPE_i}$ $\text{thf(ax}_{007}, \text{axiom})$
 $\text{likes_THFTYPE_IioI@lBob_THFTYPE_i@lBill_THFTYPE_i}$ $\text{thf(ax}_{008}, \text{axiom})$
 $\text{parent_THFTYPE_IioI@lSue_THFTYPE_i@lAnna_THFTYPE_i}$ $\text{thf(ax}_{009}, \text{axiom})$
 $\text{parent_THFTYPE_IioI@lMary_THFTYPE_i@lAnna_THFTYPE_i}$ $\text{thf(ax}_{010}, \text{axiom})$
 $\exists r: \$i \rightarrow \$i \rightarrow \$o: (r@l\text{Sue_THFTYPE_i@lBill_THFTYPE_i} \text{ and } r@l\text{Mary_THFTYPE_i@lBill_THFTYPE_i})$ thf(con, conj)

CSR136^1.p What's a common feeling of Sue and Mary to Bill?

Does there exists a relation ?R that holds between Sue and Bill as well as between Mary and Bill?

$\text{num: \$tType}$ $\text{thf(numbers, type)}$
 $\text{lAnna_THFTYPE_i: \$i}$ $\text{thf(lAnna_THFTYPE_i, type)}$
 $\text{lBen_THFTYPE_i: \$i}$ $\text{thf(lBen_THFTYPE_i, type)}$
 $\text{lBill_THFTYPE_i: \$i}$ $\text{thf(lBill_THFTYPE_i, type)}$
 $\text{lBob_THFTYPE_i: \$i}$ $\text{thf(lBob_THFTYPE_i, type)}$
 $\text{lMary_THFTYPE_i: \$i}$ $\text{thf(lMary_THFTYPE_i, type)}$
 $\text{lSue_THFTYPE_i: \$i}$ $\text{thf(lSue_THFTYPE_i, type)}$
 $\text{likes_THFTYPE_IioI: \$i} \rightarrow \$i \rightarrow \o $\text{thf(likes_THFTYPE_IioI, type)}$
 $\text{parent_THFTYPE_IioI: \$i} \rightarrow \$i \rightarrow \o $\text{thf(parent_THFTYPE_IioI, type)}$
 $\text{likes_THFTYPE_IioI@lSue_THFTYPE_i@lBill_THFTYPE_i}$ thf(ax, axiom)
 $\neg @(\text{likes_THFTYPE_IioI@lSue_THFTYPE_i@lMary_THFTYPE_i})$ $\text{thf(ax}_{001}, \text{axiom})$
 $\text{likes_THFTYPE_IioI@lMary_THFTYPE_i@lBill_THFTYPE_i}$ $\text{thf(ax}_{002}, \text{axiom})$
 $\text{parent_THFTYPE_IioI@lMary_THFTYPE_i@lBen_THFTYPE_i}$ $\text{thf(ax}_{003}, \text{axiom})$
 $\text{parent_THFTYPE_IioI@lSue_THFTYPE_i@lBen_THFTYPE_i}$ $\text{thf(ax}_{004}, \text{axiom})$
 $\text{likes_THFTYPE_IioI@lBob_THFTYPE_i@lBill_THFTYPE_i}$ $\text{thf(ax}_{005}, \text{axiom})$
 $\text{parent_THFTYPE_IioI@lSue_THFTYPE_i@lAnna_THFTYPE_i}$ $\text{thf(ax}_{006}, \text{axiom})$
 $\text{parent_THFTYPE_IioI@lMary_THFTYPE_i@lAnna_THFTYPE_i}$ $\text{thf(ax}_{007}, \text{axiom})$
 $\exists r: \$i \rightarrow \$i \rightarrow \$o: (r@l\text{Sue_THFTYPE_i@lBill_THFTYPE_i} \text{ and } r@l\text{Mary_THFTYPE_i@lBill_THFTYPE_i} \text{ and } \neg @\forall a: \$i, b: \dots)$

CSR136^2.p What's a common feeling of Sue and Mary to Bill?

Does there exists a relation ?R that holds between Sue and Bill as well as between Mary and Bill?

$\text{num: \$tType}$ $\text{thf(numbers, type)}$
 $\text{lAnna_THFTYPE_i: \$i}$ $\text{thf(lAnna_THFTYPE_i, type)}$
 $\text{lBen_THFTYPE_i: \$i}$ $\text{thf(lBen_THFTYPE_i, type)}$
 $\text{lBill_THFTYPE_i: \$i}$ $\text{thf(lBill_THFTYPE_i, type)}$

$\text{lBob_THFTYPE_i: } \$i \quad \text{thf}(\text{lBob_THFTYPE_i, type})$
 $\text{lMary_THFTYPE_i: } \$i \quad \text{thf}(\text{lMary_THFTYPE_i, type})$
 $\text{lSue_THFTYPE_i: } \$i \quad \text{thf}(\text{lSue_THFTYPE_i, type})$
 $\text{likes_THFTYPE_IioI: } \$i \rightarrow \$i \rightarrow \$o \quad \text{thf}(\text{likes_THFTYPE_IioI, type})$
 $\text{parent_THFTYPE_IioI: } \$i \rightarrow \$i \rightarrow \$o \quad \text{thf}(\text{parent_THFTYPE_IioI, type})$
 $\text{likes_THFTYPE_IioI@lSue_THFTYPE_i@lBill_THFTYPE_i} \quad \text{thf}(\text{ax, axiom})$
 $\text{likes_THFTYPE_IioI@lSue_THFTYPE_i@lBill_THFTYPE_i} \quad \text{thf}(\text{ax}_{001}, \text{axiom})$
 $\neg @(\text{likes_THFTYPE_IioI@lSue_THFTYPE_i@lMary_THFTYPE_i}) \quad \text{thf}(\text{ax}_{002}, \text{axiom})$
 $\neg @(\text{likes_THFTYPE_IioI@lSue_THFTYPE_i@lMary_THFTYPE_i}) \quad \text{thf}(\text{ax}_{003}, \text{axiom})$
 $\text{likes_THFTYPE_IioI@lMary_THFTYPE_i@lBill_THFTYPE_i} \quad \text{thf}(\text{ax}_{004}, \text{axiom})$
 $\text{likes_THFTYPE_IioI@lMary_THFTYPE_i@lBill_THFTYPE_i} \quad \text{thf}(\text{ax}_{005}, \text{axiom})$
 $\text{parent_THFTYPE_IioI@lMary_THFTYPE_i@lBen_THFTYPE_i} \quad \text{thf}(\text{ax}_{006}, \text{axiom})$
 $\text{parent_THFTYPE_IioI@lSue_THFTYPE_i@lBen_THFTYPE_i} \quad \text{thf}(\text{ax}_{007}, \text{axiom})$
 $\text{likes_THFTYPE_IioI@lBob_THFTYPE_i@lBill_THFTYPE_i} \quad \text{thf}(\text{ax}_{008}, \text{axiom})$
 $\text{parent_THFTYPE_IioI@lSue_THFTYPE_i@lAnna_THFTYPE_i} \quad \text{thf}(\text{ax}_{009}, \text{axiom})$
 $\text{parent_THFTYPE_IioI@lMary_THFTYPE_i@lAnna_THFTYPE_i} \quad \text{thf}(\text{ax}_{010}, \text{axiom})$
 $\exists r: \$i \rightarrow \$i \rightarrow \$o: (r @ \text{lSue_THFTYPE_i@lBill_THFTYPE_i} \text{ and } r @ \text{lMary_THFTYPE_i@lBill_THFTYPE_i} \text{ and } \neg @ \forall a: \$i, b:$

CSR137^{1.p} Feelings from people to Bill and Anna

Do there exist relations ?R and ?Q so that ?R holds between a person ?Y and Bill and ?Q between ?Y and Anna.

$\text{num: } \$t\text{Type} \quad \text{thf}(\text{numbers, type})$
 $\text{lAnna_THFTYPE_i: } \$i \quad \text{thf}(\text{lAnna_THFTYPE_i, type})$
 $\text{lBen_THFTYPE_i: } \$i \quad \text{thf}(\text{lBen_THFTYPE_i, type})$
 $\text{lBill_THFTYPE_i: } \$i \quad \text{thf}(\text{lBill_THFTYPE_i, type})$
 $\text{lBob_THFTYPE_i: } \$i \quad \text{thf}(\text{lBob_THFTYPE_i, type})$
 $\text{lMary_THFTYPE_i: } \$i \quad \text{thf}(\text{lMary_THFTYPE_i, type})$
 $\text{lSue_THFTYPE_i: } \$i \quad \text{thf}(\text{lSue_THFTYPE_i, type})$
 $\text{likes_THFTYPE_IioI: } \$i \rightarrow \$i \rightarrow \$o \quad \text{thf}(\text{likes_THFTYPE_IioI, type})$
 $\text{parent_THFTYPE_IioI: } \$i \rightarrow \$i \rightarrow \$o \quad \text{thf}(\text{parent_THFTYPE_IioI, type})$
 $\text{likes_THFTYPE_IioI@lSue_THFTYPE_i@lBill_THFTYPE_i} \quad \text{thf}(\text{ax, axiom})$
 $\neg @(\text{likes_THFTYPE_IioI@lSue_THFTYPE_i@lMary_THFTYPE_i}) \quad \text{thf}(\text{ax}_{001}, \text{axiom})$
 $\text{likes_THFTYPE_IioI@lMary_THFTYPE_i@lBill_THFTYPE_i} \quad \text{thf}(\text{ax}_{002}, \text{axiom})$
 $\text{parent_THFTYPE_IioI@lMary_THFTYPE_i@lBen_THFTYPE_i} \quad \text{thf}(\text{ax}_{003}, \text{axiom})$
 $\text{parent_THFTYPE_IioI@lSue_THFTYPE_i@lBen_THFTYPE_i} \quad \text{thf}(\text{ax}_{004}, \text{axiom})$
 $\neg @(\text{parent_THFTYPE_IioI@lBob_THFTYPE_i@lBen_THFTYPE_i}) \quad \text{thf}(\text{ax}_{005}, \text{axiom})$
 $\text{likes_THFTYPE_IioI@lBob_THFTYPE_i@lBill_THFTYPE_i} \quad \text{thf}(\text{ax}_{006}, \text{axiom})$
 $\text{parent_THFTYPE_IioI@lSue_THFTYPE_i@lAnna_THFTYPE_i} \quad \text{thf}(\text{ax}_{007}, \text{axiom})$
 $\text{parent_THFTYPE_IioI@lMary_THFTYPE_i@lAnna_THFTYPE_i} \quad \text{thf}(\text{ax}_{008}, \text{axiom})$
 $\neg @(\text{parent_THFTYPE_IioI@lBob_THFTYPE_i@lAnna_THFTYPE_i}) \quad \text{thf}(\text{ax}_{009}, \text{axiom})$
 $\exists q: \$i \rightarrow \$i \rightarrow \$o, r: \$i \rightarrow \$i \rightarrow \$o, y: \$i: (r @ y @ \text{lBill_THFTYPE_i} \text{ and } q @ y @ \text{lAnna_THFTYPE_i} \text{ and } \neg @ \forall a: \$i, b: \$i: (r @ a @ b)$

CSR138^{1.p} Feelings from people to Bill and Anna

Do there exist relations ?R and ?Q so that ?R holds between a person ?Y and Bill and ?Q between ?Y and Anna.

$\text{num: } \$t\text{Type} \quad \text{thf}(\text{numbers, type})$
 $\text{lAnna_THFTYPE_i: } \$i \quad \text{thf}(\text{lAnna_THFTYPE_i, type})$
 $\text{lBen_THFTYPE_i: } \$i \quad \text{thf}(\text{lBen_THFTYPE_i, type})$
 $\text{lBill_THFTYPE_i: } \$i \quad \text{thf}(\text{lBill_THFTYPE_i, type})$
 $\text{lBob_THFTYPE_i: } \$i \quad \text{thf}(\text{lBob_THFTYPE_i, type})$
 $\text{lMary_THFTYPE_i: } \$i \quad \text{thf}(\text{lMary_THFTYPE_i, type})$
 $\text{lSue_THFTYPE_i: } \$i \quad \text{thf}(\text{lSue_THFTYPE_i, type})$
 $\text{likes_THFTYPE_IioI: } \$i \rightarrow \$i \rightarrow \$o \quad \text{thf}(\text{likes_THFTYPE_IioI, type})$
 $\text{parent_THFTYPE_IioI: } \$i \rightarrow \$i \rightarrow \$o \quad \text{thf}(\text{parent_THFTYPE_IioI, type})$
 $\text{likes_THFTYPE_IioI@lSue_THFTYPE_i@lBill_THFTYPE_i} \quad \text{thf}(\text{ax, axiom})$
 $\text{likes_THFTYPE_IioI@lMary_THFTYPE_i@lBill_THFTYPE_i} \quad \text{thf}(\text{ax}_{001}, \text{axiom})$
 $\exists x: \$i, y: \$i: (\neg @(\text{parent_THFTYPE_IioI}@x@y)) \quad \text{thf}(\text{ax}_{002}, \text{axiom})$
 $\exists x: \$i, y: \$i: (\neg @(\text{likes_THFTYPE_IioI}@x@y)) \quad \text{thf}(\text{ax}_{003}, \text{axiom})$
 $\text{parent_THFTYPE_IioI@lMary_THFTYPE_i@lBen_THFTYPE_i} \quad \text{thf}(\text{ax}_{004}, \text{axiom})$
 $\text{parent_THFTYPE_IioI@lSue_THFTYPE_i@lBen_THFTYPE_i} \quad \text{thf}(\text{ax}_{005}, \text{axiom})$
 $\text{likes_THFTYPE_IioI@lBob_THFTYPE_i@lBill_THFTYPE_i} \quad \text{thf}(\text{ax}_{006}, \text{axiom})$
 $\text{parent_THFTYPE_IioI@lSue_THFTYPE_i@lAnna_THFTYPE_i} \quad \text{thf}(\text{ax}_{007}, \text{axiom})$

parent_THFTYPE_IioI@lMary_THFTYPE_i@lAnna_THFTYPE_i thf(ax008, axiom)
 $\exists q: \$i \rightarrow \$i \rightarrow \$o, r: \$i \rightarrow \$i \rightarrow \$o, y: \$i: (r@y@lBill_THFTYPE_i \text{ and } q@y@lAnna_THFTYPE_i \text{ and } \neg@r =$
 $(\lambda z: \$i, w: \$i: \$true) \text{ and } \neg@q = (\lambda z: \$i, w: \$i: \$true))$ thf(con, conjecture)

CSR139^1.p Different feelings from people to Bill and Anna

Do there exists different relations ?R and ?Q so that ?R holds between a person ?Y and Bill and ?Q between ?Y and Anna.

num: \$tType thf(numbers, type)
 lAnna_THFTYPE_i: \$i thf(lAnna_THFTYPE_i, type)
 lBen_THFTYPE_i: \$i thf(lBen_THFTYPE_i, type)
 lBill_THFTYPE_i: \$i thf(lBill_THFTYPE_i, type)
 lBob_THFTYPE_i: \$i thf(lBob_THFTYPE_i, type)
 lMary_THFTYPE_i: \$i thf(lMary_THFTYPE_i, type)
 lSue_THFTYPE_i: \$i thf(lSue_THFTYPE_i, type)
 likes_THFTYPE_IioI: \$i → \$i → \$o thf(likes_THFTYPE_IioI, type)
 parent_THFTYPE_IioI: \$i → \$i → \$o thf(parent_THFTYPE_IioI, type)
 likes_THFTYPE_IioI@lSue_THFTYPE_i@lBill_THFTYPE_i thf(ax, axiom)
 $\neg@(likes_THFTYPE_IioI@lSue_THFTYPE_i@lMary_THFTYPE_i)$ thf(ax001, axiom)
 likes_THFTYPE_IioI@lMary_THFTYPE_i@lBill_THFTYPE_i thf(ax002, axiom)
 parent_THFTYPE_IioI@lMary_THFTYPE_i@lBen_THFTYPE_i thf(ax003, axiom)
 parent_THFTYPE_IioI@lSue_THFTYPE_i@lBen_THFTYPE_i thf(ax004, axiom)
 $\neg@(parent_THFTYPE_IioI@lBob_THFTYPE_i@lBen_THFTYPE_i)$ thf(ax005, axiom)
 likes_THFTYPE_IioI@lBob_THFTYPE_i@lBill_THFTYPE_i thf(ax006, axiom)
 parent_THFTYPE_IioI@lSue_THFTYPE_i@lAnna_THFTYPE_i thf(ax007, axiom)
 parent_THFTYPE_IioI@lMary_THFTYPE_i@lAnna_THFTYPE_i thf(ax008, axiom)
 $\neg@(parent_THFTYPE_IioI@lBob_THFTYPE_i@lAnna_THFTYPE_i)$ thf(ax009, axiom)
 $\exists q: \$i \rightarrow \$i \rightarrow \$o, r: \$i \rightarrow \$i \rightarrow \$o, y: \$i: (r@y@lBill_THFTYPE_i \text{ and } q@y@lAnna_THFTYPE_i \text{ and } \neg@r =$
 $q)$ thf(con, conjecture)

CSR140^1.p Different feelings for Anna

Does there exists a relation ?R and persons ?X and ?Y so that ?R holds between ?X and Anna but not between ?Y and Anna.

num: \$tType thf(numbers, type)
 lAnna_THFTYPE_i: \$i thf(lAnna_THFTYPE_i, type)
 lBen_THFTYPE_i: \$i thf(lBen_THFTYPE_i, type)
 lBill_THFTYPE_i: \$i thf(lBill_THFTYPE_i, type)
 lBob_THFTYPE_i: \$i thf(lBob_THFTYPE_i, type)
 lMary_THFTYPE_i: \$i thf(lMary_THFTYPE_i, type)
 lSue_THFTYPE_i: \$i thf(lSue_THFTYPE_i, type)
 likes_THFTYPE_IioI: \$i → \$i → \$o thf(likes_THFTYPE_IioI, type)
 parent_THFTYPE_IioI: \$i → \$i → \$o thf(parent_THFTYPE_IioI, type)
 likes_THFTYPE_IioI@lSue_THFTYPE_i@lBill_THFTYPE_i thf(ax, axiom)
 $\neg@(likes_THFTYPE_IioI@lSue_THFTYPE_i@lMary_THFTYPE_i)$ thf(ax001, axiom)
 likes_THFTYPE_IioI@lMary_THFTYPE_i@lBill_THFTYPE_i thf(ax002, axiom)
 parent_THFTYPE_IioI@lMary_THFTYPE_i@lBen_THFTYPE_i thf(ax003, axiom)
 parent_THFTYPE_IioI@lSue_THFTYPE_i@lBen_THFTYPE_i thf(ax004, axiom)
 $\neg@(parent_THFTYPE_IioI@lBob_THFTYPE_i@lBen_THFTYPE_i)$ thf(ax005, axiom)
 likes_THFTYPE_IioI@lBob_THFTYPE_i@lBill_THFTYPE_i thf(ax006, axiom)
 parent_THFTYPE_IioI@lSue_THFTYPE_i@lAnna_THFTYPE_i thf(ax007, axiom)
 parent_THFTYPE_IioI@lMary_THFTYPE_i@lAnna_THFTYPE_i thf(ax008, axiom)
 $\neg@(parent_THFTYPE_IioI@lBob_THFTYPE_i@lAnna_THFTYPE_i)$ thf(ax009, axiom)
 $\exists r: \$i \rightarrow \$i \rightarrow \$o, x: \$i, y: \$i: (r@x@lAnna_THFTYPE_i \text{ and } \neg@(r@y@lAnna_THFTYPE_i))$ thf(con, conjecture)

CSR141^1.p Reiner and MariaPaola are not connected at the CADE meeting

CADE_BM is a Meeting. One agent of this meeting is MariaPaola and one is Reiner. It holds that both agents are not connected during the meeting.

num: \$tType thf(numbers, type)
 agent_THFTYPE_IioI: \$i → \$i → \$o thf(agent_THFTYPE_IioI, type)
 connected_THFTYPE_IioI: \$i → \$i → \$o thf(connected_THFTYPE_IioI, type)
 holdsDuring_THFTYPE_IioI: \$i → \$o → \$o thf(holdsDuring_THFTYPE_IioI, type)
 instance_THFTYPE_IioI: \$i → \$i → \$o thf(instance_THFTYPE_IioI, type)

ICADE_BM_THFTYPE.i: \$i thf(ICADE_BM_THFTYPE.i, type)
 lMariaPaola_THFTYPE.i: \$i thf(lMariaPaola_THFTYPE.i, type)
 lMeeting_THFTYPE.i: \$i thf(lMeeting_THFTYPE.i, type)
 lReiner_THFTYPE.i: \$i thf(lReiner_THFTYPE.i, type)
 lWhenFn_THFTYPE.IiiI: \$i → \$i thf(lWhenFn_THFTYPE.IiiI, type)
 lNear_THFTYPE.i: \$i thf(lNear_THFTYPE.i, type)
 orientation_THFTYPE.IiiiI: \$i → \$i → \$i → \$o thf(orientation_THFTYPE.IiiiI, type)
 agent_THFTYPE.IiiiI@lCADE_BM_THFTYPE.i@lReiner_THFTYPE.i thf(ax, axiom)
 agent_THFTYPE.IiiiI@lCADE_BM_THFTYPE.i@lMariaPaola_THFTYPE.i thf(ax₀₀₁, axiom)
 instance_THFTYPE.IiiiI@lCADE_BM_THFTYPE.i@lMeeting_THFTYPE.i thf(ax₀₀₂, axiom)
 holdsDuring_THFTYPE.IiooI@(lWhenFn_THFTYPE.IiiI@lCADE_BM_THFTYPE.i)@\$true thf(ax₀₀₃, axiom)
 $\forall mEET: \$i, aGENT_2: \$i, aGENT_1: \$i: ((instance_THFTYPE_IiiiI@mEET@lMeeting_THFTYPE.i \text{ and } agent_THFTYPE_IiiiI@lCADE_BM_THFTYPE.i) \Rightarrow (holdsDuring_THFTYPE_IiooI@(lWhenFn_THFTYPE_IiiI@mEET)@(orientation_THFTYPE_IiiiI@aGENT_1@aGENT_2@lNear_THFTYPE.i)))$
 $\forall oBJ_1: \$i, oBJ_2: \$i: ((orientation_THFTYPE_IiiiI@oBJ_1@oBJ_2@lNear_THFTYPE.i) \Rightarrow (\neg @(connected_THFTYPE_IiiiI@lCADE_BM_THFTYPE.i)@(\neg @(connected_THFTYPE_IiiiI@lCADE_BM_THFTYPE.i))))$

CSR141 \wedge 3.p Reiner and MariaPaola are not connected at the CADE meeting

CADE_BM is a Meeting. One agent of this meeting is MariaPaola and one is Reiner. It holds that both agents are not connected during the meeting.

num: \$tType thf(numbers, type)
 agent_THFTYPE.IiiiI: \$i → \$i → \$o thf(agent_THFTYPE.IiiiI, type)
 connected_THFTYPE.IiiiI: \$i → \$i → \$o thf(connected_THFTYPE.IiiiI, type)
 holdsDuring_THFTYPE.IiooI: \$i → \$o → \$o thf(holdsDuring_THFTYPE.IiooI, type)
 instance_THFTYPE.IiiiI: \$i → \$i → \$o thf(instance_THFTYPE.IiiiI, type)
 ICADE_BM_THFTYPE.i: \$i thf(ICADE_BM_THFTYPE.i, type)
 lMariaPaola_THFTYPE.i: \$i thf(lMariaPaola_THFTYPE.i, type)
 lMeeting_THFTYPE.i: \$i thf(lMeeting_THFTYPE.i, type)
 lReiner_THFTYPE.i: \$i thf(lReiner_THFTYPE.i, type)
 lWhenFn_THFTYPE.IiiI: \$i → \$i thf(lWhenFn_THFTYPE.IiiI, type)
 agent_THFTYPE.IiiiI@lCADE_BM_THFTYPE.i@lReiner_THFTYPE.i thf(ax, axiom)
 agent_THFTYPE.IiiiI@lCADE_BM_THFTYPE.i@lMariaPaola_THFTYPE.i thf(ax₀₀₁, axiom)
 instance_THFTYPE.IiiiI@lCADE_BM_THFTYPE.i@lMeeting_THFTYPE.i thf(ax₀₀₂, axiom)
 holdsDuring_THFTYPE.IiooI@(lWhenFn_THFTYPE.IiiI@lCADE_BM_THFTYPE.i)@\$true thf(ax₀₀₃, axiom)
 holdsDuring_THFTYPE.IiooI@(lWhenFn_THFTYPE.IiiI@lCADE_BM_THFTYPE.i)@(\neg @(connected_THFTYPE.IiiiI@lCADE_BM_THFTYPE.i))

CSR142 \wedge 1.p Who is the husband of Corina?

Corina is the wife of Chris. Who is the husband of Corina?

num: \$tType thf(numbers, type)
 husband_THFTYPE.IiiiI: \$i → \$i → \$o thf(husband_THFTYPE.IiiiI, type)
 lChris_THFTYPE.i: \$i thf(lChris_THFTYPE.i, type)
 lCorina_THFTYPE.i: \$i thf(lCorina_THFTYPE.i, type)
 wife_THFTYPE.IiiiI: \$i → \$i → \$o thf(wife_THFTYPE.IiiiI, type)
 inverse_THFTYPE.IiiiI@lhusband_THFTYPE.IiiiI@lwife_THFTYPE.IiiiI: (\$i → \$i → \$o) → (\$i → \$i → \$o) → \$o thf(inverse_THFTYPE.IiiiI@lhusband_THFTYPE.IiiiI@lwife_THFTYPE.IiiiI, type)
 $\forall rEL_2: \$i \rightarrow \$i \rightarrow \$o, rEL_1: \$i \rightarrow \$i \rightarrow \$o: ((inverse_THFTYPE_IiiiI@rEL_1@rEL_2) \Rightarrow \forall iNST_1: \$i, iNST_2: \$i: ((rEL_1@iNST_1) \Rightarrow (rEL_2@iNST_2)))$ thf(ax₀₀₁, axiom)
 wife_THFTYPE.IiiiI@lCorina_THFTYPE.i@lChris_THFTYPE.i thf(ax₀₀₂, axiom)
 $\exists x: \$i: (husband_THFTYPE_IiiiI@x@lCorina_THFTYPE.i) \text{ thf(con, conjecture)}$

CSR142 \wedge 3.p Who is the husband of Corina?

Corina is the wife of Chris. Who is the husband of Corina?

num: \$tType thf(numbers, type)
 husband_THFTYPE.IiiiI: \$i → \$i → \$o thf(husband_THFTYPE.IiiiI, type)
 lChris_THFTYPE.i: \$i thf(lChris_THFTYPE.i, type)
 lCorina_THFTYPE.i: \$i thf(lCorina_THFTYPE.i, type)
 wife_THFTYPE.IiiiI: \$i → \$i → \$o thf(wife_THFTYPE.IiiiI, type)
 wife_THFTYPE.IiiiI@lCorina_THFTYPE.i@lChris_THFTYPE.i thf(ax, axiom)
 $\exists x: \$i: (husband_THFTYPE_IiiiI@x@lCorina_THFTYPE.i) \text{ thf(con, conjecture)}$

CSR143 \wedge 1.p Who is the husband of Corina during 2009?

During 2009 Corina is the wife of Chris. True holds at any time. Who is the husband of Corina during 2009?

$\text{num: } \$t\text{Type} \quad \text{thf}(\text{numbers}, \text{type})$
 $\text{holdsDuring_THFTYPE_IiooI: } \$i \rightarrow \$o \rightarrow \$o \quad \text{thf}(\text{holdsDuring_THFTYPE_IiooI}, \text{type})$
 $\text{husband_THFTYPE_IiooI: } \$i \rightarrow \$i \rightarrow \$o \quad \text{thf}(\text{husband_THFTYPE_IiooI}, \text{type})$
 $\text{lChris_THFTYPE_i: } \$i \quad \text{thf}(\text{lChris_THFTYPE_i}, \text{type})$
 $\text{lCorina_THFTYPE_i: } \$i \quad \text{thf}(\text{lCorina_THFTYPE_i}, \text{type})$
 $\text{lYearFn_THFTYPE_IiiiI: } \$i \rightarrow \$i \quad \text{thf}(\text{lYearFn_THFTYPE_IiiiI}, \text{type})$
 $\text{n2009_THFTYPE_i: } \$i \quad \text{thf}(\text{n2009_THFTYPE_i}, \text{type})$
 $\text{wife_THFTYPE_IiooI: } \$i \rightarrow \$i \rightarrow \$o \quad \text{thf}(\text{wife_THFTYPE_IiooI}, \text{type})$
 $\text{inverse_THFTYPE_IiiiIiiiIoIoI: } (\$i \rightarrow \$i \rightarrow \$o) \rightarrow (\$i \rightarrow \$i \rightarrow \$o) \rightarrow \$o \quad \text{thf}(\text{inverse_THFTYPE_IiiiIiiiIoIoI}, \text{type})$
 $\text{inverse_THFTYPE_IiiiIiiiIoIoI@husband_THFTYPE_IiooI@wife_THFTYPE_IiooI} \quad \text{thf}(\text{ax}, \text{axiom})$
 $\forall rEL_2: \$i \rightarrow \$i \rightarrow \$o, rEL_1: \$i \rightarrow \$i \rightarrow \$o: ((\text{inverse_THFTYPE_IiiiIiiiIoIoI}@rEL_1@rEL_2) \Rightarrow \forall iNST_1: \$i, iNST_2: \$i: ((rEL_1@$
 $(rEL_2@iNST_2@iNST_1))) \quad \text{thf}(\text{ax}_{001}, \text{axiom})$
 $\forall z: \$i: (\text{holdsDuring_THFTYPE_IiooI}@z@\$true) \quad \text{thf}(\text{ax}_{002}, \text{axiom})$
 $\text{holdsDuring_THFTYPE_IiooI@lYearFn_THFTYPE_IiiiI@n2009_THFTYPE_i}@(\text{wife_THFTYPE_IiooI}@lCorina_THFTYPE_i}$
 $\exists x: \$i: (\text{holdsDuring_THFTYPE_IiooI}@lYearFn_THFTYPE_IiiiI@n2009_THFTYPE_i}@(\text{husband_THFTYPE_IiooI}@x@lCorina_THFTYPE_i})$

CSR143^3.p Who is the husband of Corina during 2009?

During 2009 Corina is the wife of Chris. True holds at any time. Who is the husband of Corina during 2009?

$\text{num: } \$t\text{Type} \quad \text{thf}(\text{numbers}, \text{type})$
 $\text{holdsDuring_THFTYPE_IiooI: } \$i \rightarrow \$o \rightarrow \$o \quad \text{thf}(\text{holdsDuring_THFTYPE_IiooI}, \text{type})$
 $\text{husband_THFTYPE_IiooI: } \$i \rightarrow \$i \rightarrow \$o \quad \text{thf}(\text{husband_THFTYPE_IiooI}, \text{type})$
 $\text{lChris_THFTYPE_i: } \$i \quad \text{thf}(\text{lChris_THFTYPE_i}, \text{type})$
 $\text{lCorina_THFTYPE_i: } \$i \quad \text{thf}(\text{lCorina_THFTYPE_i}, \text{type})$
 $\text{lYearFn_THFTYPE_IiiiI: } \$i \rightarrow \$i \quad \text{thf}(\text{lYearFn_THFTYPE_IiiiI}, \text{type})$
 $\text{n2009_THFTYPE_i: } \$i \quad \text{thf}(\text{n2009_THFTYPE_i}, \text{type})$
 $\text{wife_THFTYPE_IiooI: } \$i \rightarrow \$i \rightarrow \$o \quad \text{thf}(\text{wife_THFTYPE_IiooI}, \text{type})$
 $\forall z: \$i: (\text{holdsDuring_THFTYPE_IiooI}@z@\$true) \quad \text{thf}(\text{ax}, \text{axiom})$
 $\text{holdsDuring_THFTYPE_IiooI@lYearFn_THFTYPE_IiiiI@n2009_THFTYPE_i}@(\text{wife_THFTYPE_IiooI}@lCorina_THFTYPE_i}$
 $\exists x: \$i: (\text{holdsDuring_THFTYPE_IiooI}@lYearFn_THFTYPE_IiiiI@n2009_THFTYPE_i}@(\text{husband_THFTYPE_IiooI}@x@lCorina_THFTYPE_i})$

CSR144^1.p Does Max think he's single?

There is no time during which Max considers to have a wife. Is it true that Max does not believe that he is a husband of somebody?.

$\text{num: } \$t\text{Type} \quad \text{thf}(\text{numbers}, \text{type})$
 $\text{believes_THFTYPE_IiooI: } \$i \rightarrow \$o \rightarrow \$o \quad \text{thf}(\text{believes_THFTYPE_IiooI}, \text{type})$
 $\text{considers_THFTYPE_IiooI: } \$i \rightarrow \$o \rightarrow \$o \quad \text{thf}(\text{considers_THFTYPE_IiooI}, \text{type})$
 $\text{holdsDuring_THFTYPE_IiooI: } \$i \rightarrow \$o \rightarrow \$o \quad \text{thf}(\text{holdsDuring_THFTYPE_IiooI}, \text{type})$
 $\text{husband_THFTYPE_IiooI: } \$i \rightarrow \$i \rightarrow \$o \quad \text{thf}(\text{husband_THFTYPE_IiooI}, \text{type})$
 $\text{lMax_THFTYPE_i: } \$i \quad \text{thf}(\text{lMax_THFTYPE_i}, \text{type})$
 $\text{wife_THFTYPE_IiooI: } \$i \rightarrow \$i \rightarrow \$o \quad \text{thf}(\text{wife_THFTYPE_IiooI}, \text{type})$
 $\text{inverse_THFTYPE_IiiiIiiiIoIoI: } (\$i \rightarrow \$i \rightarrow \$o) \rightarrow (\$i \rightarrow \$i \rightarrow \$o) \rightarrow \$o \quad \text{thf}(\text{inverse_THFTYPE_IiiiIiiiIoIoI}, \text{type})$
 $\text{inverse_THFTYPE_IiiiIiiiIoIoI@husband_THFTYPE_IiooI@wife_THFTYPE_IiooI} \quad \text{thf}(\text{ax}, \text{axiom})$
 $\forall rEL_2: \$i \rightarrow \$i \rightarrow \$o, rEL_1: \$i \rightarrow \$i \rightarrow \$o: ((\text{inverse_THFTYPE_IiiiIiiiIoIoI}@rEL_1@rEL_2) \Rightarrow \forall iNST_1: \$i, iNST_2: \$i: ((rEL_1@$
 $(rEL_2@iNST_2@iNST_1))) \quad \text{thf}(\text{ax}_{001}, \text{axiom})$
 $\forall fORMULA: \$o, aGENT: \$i: ((\text{believes_THFTYPE_IiooI}@aGENT@fORMULA) \Rightarrow \exists tIME: \$i: (\text{holdsDuring_THFTYPE_IiooI}@tIME@fORMULA))$
 $\forall x: \$i: (\neg @ \exists z: \$i: (\text{holdsDuring_THFTYPE_IiooI}@z@(\text{considers_THFTYPE_IiooI}@lMax_THFTYPE_i@(\text{wife_THFTYPE_IiooI}@z@\$true))))$
 $\exists z: \$i: (\neg @(\text{believes_THFTYPE_IiooI}@lMax_THFTYPE_i@(\text{husband_THFTYPE_IiooI}@lMax_THFTYPE_i@z))) \quad \text{thf}(\text{con}$

CSR144^3.p Does Max think he's single?

There is no time during which Max considers to have a wife. Is it true that Max does not believe that he is a husband of somebody?.

$\text{num: } \$t\text{Type} \quad \text{thf}(\text{numbers}, \text{type})$
 $\text{believes_THFTYPE_IiooI: } \$i \rightarrow \$o \rightarrow \$o \quad \text{thf}(\text{believes_THFTYPE_IiooI}, \text{type})$
 $\text{considers_THFTYPE_IiooI: } \$i \rightarrow \$o \rightarrow \$o \quad \text{thf}(\text{considers_THFTYPE_IiooI}, \text{type})$
 $\text{holdsDuring_THFTYPE_IiooI: } \$i \rightarrow \$o \rightarrow \$o \quad \text{thf}(\text{holdsDuring_THFTYPE_IiooI}, \text{type})$
 $\text{husband_THFTYPE_IiooI: } \$i \rightarrow \$i \rightarrow \$o \quad \text{thf}(\text{husband_THFTYPE_IiooI}, \text{type})$
 $\text{lMax_THFTYPE_i: } \$i \quad \text{thf}(\text{lMax_THFTYPE_i}, \text{type})$
 $\text{wife_THFTYPE_IiooI: } \$i \rightarrow \$i \rightarrow \$o \quad \text{thf}(\text{wife_THFTYPE_IiooI}, \text{type})$
 $\forall x: \$i: (\neg @ \exists z: \$i: (\text{holdsDuring_THFTYPE_IiooI}@z@(\text{considers_THFTYPE_IiooI}@lMax_THFTYPE_i@(\text{wife_THFTYPE_IiooI}@z@\$true))))$
 $\exists z: \$i: (\neg @(\text{believes_THFTYPE_IiooI}@lMax_THFTYPE_i@(\text{husband_THFTYPE_IiooI}@lMax_THFTYPE_i@z))) \quad \text{thf}(\text{con}$

CSR145^1.p What is the relation between Chris and Corina?

Corina is the wife of Chris. There is some person Chris is not husband of. What is the relationship between Chris and Corina?

```

num: $tType    thf(numbers, type)
husband_THFTYPE_IiioI: $i → $i → $o    thf(husband_THFTYPE_IiioI, type)
lChris_THFTYPE_i: $i    thf(lChris_THFTYPE_i, type)
lCorina_THFTYPE_i: $i    thf(lCorina_THFTYPE_i, type)
wife_THFTYPE_IiioI: $i → $i → $o    thf(wife_THFTYPE_IiioI, type)
inverse_THFTYPE_IiioIiioIoI: ($i → $i → $o) → ($i → $i → $o) → $o    thf(inverse_THFTYPE_IiioIiioIoI, type)
inverse_THFTYPE_IiioIiioIoI@husband_THFTYPE_IiioI@wife_THFTYPE_IiioI    thf(ax, axiom)
∀rEL2: $i → $i → $o, rEL1: $i → $i → $o: ((inverse_THFTYPE_IiioIiioIoI@rEL1@rEL2) ⇒ ∀iNST1: $i, iNST2: $i: ((rEL1@(rEL2@iNST2@iNST1)))    thf(ax001, axiom)
∃x: $i: (¬@(husband_THFTYPE_IiioI@lChris_THFTYPE_i@x))    thf(ax002, axiom)
wife_THFTYPE_IiioI@lCorina_THFTYPE_i@lChris_THFTYPE_i    thf(ax003, axiom)
∃r: $i → $i → $o: (r@lChris_THFTYPE_i@lCorina_THFTYPE_i and ¬@r = (λx: $i, y: $i: $true))    thf(con, conjecture)

```

CSR145^3.p What is the relation between Chris and Corina?

Corina is the wife of Chris. There is some person Chris is not husband of. What is the relationship between Chris and Corina?

```

num: $tType    thf(numbers, type)
husband_THFTYPE_IiioI: $i → $i → $o    thf(husband_THFTYPE_IiioI, type)
lChris_THFTYPE_i: $i    thf(lChris_THFTYPE_i, type)
lCorina_THFTYPE_i: $i    thf(lCorina_THFTYPE_i, type)
wife_THFTYPE_IiioI: $i → $i → $o    thf(wife_THFTYPE_IiioI, type)
∃x: $i: (¬@(husband_THFTYPE_IiioI@lChris_THFTYPE_i@x))    thf(ax, axiom)
wife_THFTYPE_IiioI@lCorina_THFTYPE_i@lChris_THFTYPE_i    thf(ax001, axiom)
∃r: $i → $i → $o: (r@lChris_THFTYPE_i@lCorina_THFTYPE_i and ¬@r = (λx: $i, y: $i: $true))    thf(con, conjecture)

```

CSR146^1.p What is the relation between Chris and Corina during 2009?

During 2009 Corina is the wife of Chris. True holds at any time. What is the relation between Chris and Corina during 2009?

```

num: $tType    thf(numbers, type)
holdsDuring_THFTYPE_IiioI: $i → $o → $o    thf(holdsDuring_THFTYPE_IiioI, type)
lChris_THFTYPE_i: $i    thf(lChris_THFTYPE_i, type)
lCorina_THFTYPE_i: $i    thf(lCorina_THFTYPE_i, type)
lYearFn_THFTYPE_Iiil: $i → $i    thf(lYearFn_THFTYPE_Iiil, type)
n2009_THFTYPE_i: $i    thf(n2009_THFTYPE_i, type)
wife_THFTYPE_IiioI: $i → $i → $o    thf(wife_THFTYPE_IiioI, type)
husband_THFTYPE_IiioI: $i → $i → $o    thf(husband_THFTYPE_IiioI, type)
inverse_THFTYPE_IiioIiioIoI: ($i → $i → $o) → ($i → $i → $o) → $o    thf(inverse_THFTYPE_IiioIiioIoI, type)
inverse_THFTYPE_IiioIiioIoI@husband_THFTYPE_IiioI@wife_THFTYPE_IiioI    thf(ax1, axiom)
∀rEL2: $i → $i → $o, rEL1: $i → $i → $o: ((inverse_THFTYPE_IiioIiioIoI@rEL1@rEL2) ⇒ ∀iNST1: $i, iNST2: $i: ((rEL1@(rEL2@iNST2@iNST1)))    thf(ax2, axiom)
∀z: $i: (holdsDuring_THFTYPE_IiioI@z@$true)    thf(ax3, axiom)
∃x: $i: (¬@(husband_THFTYPE_IiioI@lChris_THFTYPE_i@x))    thf(ax4, axiom)
holdsDuring_THFTYPE_IiioI@(lYearFn_THFTYPE_Iiil@n2009_THFTYPE_i)@(wife_THFTYPE_IiioI@lCorina_THFTYPE_i)
∃r: $i → $i → $o: (holdsDuring_THFTYPE_IiioI@(lYearFn_THFTYPE_Iiil@n2009_THFTYPE_i)@(r@lChris_THFTYPE_i) (λx: $i, y: $i: $true))    thf(con, conjecture)

```

CSR146^3.p What is the relation between Chris and Corina during 2009?

During 2009 Corina is the wife of Chris. True holds at any time. What is the relation between Chris and Corina during 2009?

```

num: $tType    thf(numbers, type)
holdsDuring_THFTYPE_IiioI: $i → $o → $o    thf(holdsDuring_THFTYPE_IiioI, type)
husband_THFTYPE_IiioI: $i → $i → $o    thf(husband_THFTYPE_IiioI, type)
lChris_THFTYPE_i: $i    thf(lChris_THFTYPE_i, type)
lCorina_THFTYPE_i: $i    thf(lCorina_THFTYPE_i, type)
lYearFn_THFTYPE_Iiil: $i → $i    thf(lYearFn_THFTYPE_Iiil, type)
n2009_THFTYPE_i: $i    thf(n2009_THFTYPE_i, type)
wife_THFTYPE_IiioI: $i → $i → $o    thf(wife_THFTYPE_IiioI, type)
inverse_THFTYPE_IiioIiioIoI: ($i → $i → $o) → ($i → $i → $o) → $o    thf(inverse_THFTYPE_IiioIiioIoI, type)

```

inverse_THFTYPE_IiioIiioIoI@husband_THFTYPE_IiioI@wife_THFTYPE_IiioI thf(ax, axiom)
 $\forall rEL_2: \$i \rightarrow \$i \rightarrow \$o, rEL_1: \$i \rightarrow \$i \rightarrow \$o: ((inverse_THFTYPE_IiioIiioIoI@rEL_1@rEL_2) \Rightarrow \forall iNST_1: \$i, iNST_2: \$i: ((rEL_1@rEL_2@iNST_2@iNST_1)))$ thf(ax₀₀₁, axiom)
 $\forall z: \$i: (holdsDuring_THFTYPE_IiioI@z@\$true)$ thf(ax₀₀₂, axiom)
 $\exists x: \$i: (\neg@(husband_THFTYPE_IiioI@lChris_THFTYPE_i@x))$ thf(ax₀₀₃, axiom)
holdsDuring_THFTYPE_IiioI@(lYearFn_THFTYPE_IiioI@n2009_THFTYPE_i)@(wife_THFTYPE_IiioI@lCorina_THFTYPE_i)
 $\exists r: \$i \rightarrow \$i \rightarrow \$o: (holdsDuring_THFTYPE_IiioI@(lYearFn_THFTYPE_IiioI@n2009_THFTYPE_i)@(r@lChris_THFTYPE_i@(\lambda x: \$i, y: \$i: \$true)))$ thf(con, conjecture)

CSR147+1.p My experienced brother

An older human sibling is more experienced than a younger one, or the younger one has seen more of the world.

$\exists a: s_Human(a)$ fof(human_type, axiom)
 $\exists a: s_LivingThing(a)$ fof(living_type, axiom)
 $\forall a: (s_Human(a) \Rightarrow s_LivingThing(a))$ fof(humans_are_living, axiom)
s_Human(geoff) fof(geoff_human, axiom)
s_Human(jim) fof(jim_human, axiom)
 $\forall a: (s_Human(a) \Rightarrow s_Human(s_siblingFn(a)))$ fof(sibling_type, axiom)
 $\forall o, oAge, yAge: (s_Human(o) \Rightarrow ((s_age(o, oAge) \text{ and } s_age(s_siblingFn(o), yAge) \text{ and } greater(oAge, yAge)) \Rightarrow (s_more_experienced(o, s_siblingFn(o)) \text{ or } s_has_seen_more(s_siblingFn(o), o))))$ fof(experience, axiom)
 $\forall x, y: ((s_Human(x) \text{ and } s_Human(y)) \Rightarrow (x = s_siblingFn(y) \Rightarrow y = s_siblingFn(x)))$ fof(sibling_symmetry, axiom)
s_age(geoff, n₄₈) fof(geoff₄₈, axiom)
s_age(jim, n₅₄) fof(jim₅₄, axiom)
greater(n₅₄, n₄₈) fof(greater₅₄₄₈, axiom)
geoff = s_siblingFn(jim) fof(geoff_and_jim, axiom)
 $\neg s_has_seen_more(geoff, jim)$ fof(jim_has_seen_more, axiom)
s_more_experienced(jim, geoff) fof(jim_is_experienced, conjecture)

CSR148^1.p Is there a year in which Sue liked somebody?

What holds that holds at all times. Mary likes Bill. During 2009 Sue liked whoever Mary liked. Is there a year in which Sue liked somebody?

num: \$tType thf(numbers, type)
holdsDuring_THFTYPE_IiioI: $\$i \rightarrow \$o \rightarrow \$o$ thf(holdsDuring_THFTYPE_IiioI, type)
lBill_THFTYPE_i: $\$i$ thf(lBill_THFTYPE_i, type)
lMary_THFTYPE_i: $\$i$ thf(lMary_THFTYPE_i, type)
lSue_THFTYPE_i: $\$i$ thf(lSue_THFTYPE_i, type)
lYearFn_THFTYPE_IiioI: $\$i \rightarrow \i thf(lYearFn_THFTYPE_IiioI, type)
likes_THFTYPE_IiioI: $\$i \rightarrow \$i \rightarrow \$o$ thf(likes_THFTYPE_IiioI, type)
n2009_THFTYPE_i: $\$i$ thf(n2009_THFTYPE_i, type)
likes_THFTYPE_IiioI@lMary_THFTYPE_i@lBill_THFTYPE_i thf(ax, axiom)
holdsDuring_THFTYPE_IiioI@(lYearFn_THFTYPE_IiioI@n2009_THFTYPE_i)@ $\forall x: \$i: ((likes_THFTYPE_IiioI@lMary_THFTYPE_i@x) \Rightarrow (likes_THFTYPE_IiioI@lSue_THFTYPE_i@x))$ thf(ax₀₀₁, axiom)
 $\forall p: \$o, y: \$i: (p \Rightarrow (holdsDuring_THFTYPE_IiioI@y@p))$ thf(ax₀₀₂, axiom)
 $\exists x: \$i, y: \$i: (holdsDuring_THFTYPE_IiioI@(lYearFn_THFTYPE_IiioI@y)@(likes_THFTYPE_IiioI@lSue_THFTYPE_i@x))$

CSR148^3.p Did someone like Bill in 2009?

During 2009 Mary liked Bill and Sue liked Bill. Is it the case that someone liked Bill during 2009?

include('Axioms/CSR005^0.ax')
lBill_THFTYPE_i: $\$i$ thf(lBill_THFTYPE_i, type)
lMary_THFTYPE_i: $\$i$ thf(lMary_THFTYPE_i, type)
lSue_THFTYPE_i: $\$i$ thf(lSue_THFTYPE_i, type)
likes_THFTYPE_IiioI: $\$i \rightarrow \$i \rightarrow \$o$ thf(likes_THFTYPE_IiioI, type)
n2009_THFTYPE_i: $\$i$ thf(n2009_THFTYPE_i, type)
likes_THFTYPE_IiioI@lMary_THFTYPE_i@lBill_THFTYPE_i thf(ax, axiom)
holdsDuring_THFTYPE_IiioI@(lYearFn_THFTYPE_IiioI@n2009_THFTYPE_i)@ $\forall x: \$i: ((likes_THFTYPE_IiioI@lMary_THFTYPE_i@x) \Rightarrow (likes_THFTYPE_IiioI@lSue_THFTYPE_i@x))$ thf(ax₀₀₁, axiom)
 $\forall p: \$o, y: \$i: (p \Rightarrow (holdsDuring_THFTYPE_IiioI@y@p))$ thf(ax₀₀₂, axiom)
 $\exists x: \$i, y: \$i: (holdsDuring_THFTYPE_IiioI@(lYearFn_THFTYPE_IiioI@y)@(likes_THFTYPE_IiioI@lSue_THFTYPE_i@x))$

CSR149^1.p Elegantly, is there a year in which Sue liked somebody?

What holds that holds at all times (elegantly expressed). Mary likes Bill. During 2009 Sue liked whoever Mary liked. Is there a year in which Sue liked somebody?

```

num: $tType   thf(numbers, type)
holdsDuring_THFTYPE_IioI: $i → $o → $o   thf(holdsDuring_THFTYPE_IioI, type)
lBill_THFTYPE_i: $i   thf(lBill_THFTYPE_i, type)
lMary_THFTYPE_i: $i   thf(lMary_THFTYPE_i, type)
lSue_THFTYPE_i: $i   thf(lSue_THFTYPE_i, type)
lYearFn_THFTYPE_IiiI: $i → $i   thf(lYearFn_THFTYPE_IiiI, type)
likes_THFTYPE_IioI: $i → $i → $o   thf(likes_THFTYPE_IioI, type)
n2009_THFTYPE_i: $i   thf(n2009_THFTYPE_i, type)
likes_THFTYPE_IioI@lMary_THFTYPE_i@lBill_THFTYPE_i   thf(ax, axiom)
∀y: $i: (holdsDuring_THFTYPE_IioI@y@true)   thf(ax001, axiom)
holdsDuring_THFTYPE_IioI@(lYearFn_THFTYPE_IiiI@n2009_THFTYPE_i)@∀x: $i: ((likes_THFTYPE_IioI@lMary_THF
(likes_THFTYPE_IioI@lSue_THFTYPE_i@x))   thf(ax002, axiom)
∃x: $i, y: $i: (holdsDuring_THFTYPE_IioI@(lYearFn_THFTYPE_IiiI@y)@(likes_THFTYPE_IioI@lSue_THFTYPE_i@x))

```

CSR149^3.p Did someone like Bill in 2009?

During 2009 Mary liked Bill and Sue liked Bill. Is it the case that someone liked Bill during 2009?

include('Axioms/CSR005^0.ax')

```

lBill_THFTYPE_i: $i   thf(lBill_THFTYPE_i, type)
lMary_THFTYPE_i: $i   thf(lMary_THFTYPE_i, type)
lSue_THFTYPE_i: $i   thf(lSue_THFTYPE_i, type)
likes_THFTYPE_IioI: $i → $i → $o   thf(likes_THFTYPE_IioI, type)
n2009_THFTYPE_i: $i   thf(n2009_THFTYPE_i, type)
likes_THFTYPE_IioI@lMary_THFTYPE_i@lBill_THFTYPE_i   thf(ax, axiom)
∀y: $i: (holdsDuring_THFTYPE_IioI@y@true)   thf(ax001, axiom)
holdsDuring_THFTYPE_IioI@(lYearFn_THFTYPE_IiiI@n2009_THFTYPE_i)@∀x: $i: ((likes_THFTYPE_IioI@lMary_THF
(likes_THFTYPE_IioI@lSue_THFTYPE_i@x))   thf(ax002, axiom)
∃x: $i, y: $i: (holdsDuring_THFTYPE_IioI@(lYearFn_THFTYPE_IiiI@y)@(likes_THFTYPE_IioI@lSue_THFTYPE_i@x))

```

CSR150^1.p How many grandchildren does John at most have?

The number of persons John is grandparent of is maximally three. How many grandchildren does John at most have?

```

num: $tType   thf(numbers, type)
grandchild_THFTYPE_IioI: $i → $i → $o   thf(grandchild_THFTYPE_IioI, type)
grandparent_THFTYPE_IioI: $i → $i → $o   thf(grandparent_THFTYPE_IioI, type)
lCardinalityFn_THFTYPE_IioIiI: ($i → $o) → $i   thf(lCardinalityFn_THFTYPE_IioIiI, type)
lJohn_THFTYPE_i: $i   thf(lJohn_THFTYPE_i, type)
ltet_THFTYPE_IioI: $i → $i → $o   thf(ltet_THFTYPE_IioI, type)
n3_THFTYPE_i: $i   thf(n3_THFTYPE_i, type)
parent_THFTYPE_IioI: $i → $i → $o   thf(parent_THFTYPE_IioI, type)
∀x: $i, y: $i: ((grandparent_THFTYPE_IioI@x@y) ⇔ ∃z: $i: (parent_THFTYPE_IioI@x@z and parent_THFTYPE_IioI@
ltet_THFTYPE_IioI@(lCardinalityFn_THFTYPE_IioIiI@λx: $i: (grandparent_THFTYPE_IioI@lJohn_THFTYPE_i@x))@n
∀x: $i, y: $i: ((grandchild_THFTYPE_IioI@x@y) ⇔ ∃z: $i: (parent_THFTYPE_IioI@z@x and parent_THFTYPE_IioI@y
∃y: $i: (ltet_THFTYPE_IioI@(lCardinalityFn_THFTYPE_IioIiI@λx: $i: (grandchild_THFTYPE_IioI@x@lJohn_THFTYPE

```

CSR150^3.p Did someone like Bill in 2009?

During 2009 Mary liked Bill and Sue liked Bill. Is it the case that someone liked Bill during 2009?

include('Axioms/CSR005^0.ax')

```

grandchild_THFTYPE_IioI: $i → $i → $o   thf(grandchild_THFTYPE_IioI, type)
grandparent_THFTYPE_IioI: $i → $i → $o   thf(grandparent_THFTYPE_IioI, type)
lJohn_THFTYPE_i: $i   thf(lJohn_THFTYPE_i, type)
∀x: $i, y: $i: ((grandparent_THFTYPE_IioI@x@y) ⇔ ∃z: $i: (parent_THFTYPE_IioI@x@z and parent_THFTYPE_IioI@
ltet_THFTYPE_IioI@(lCardinalityFn_THFTYPE_IioIiI@λx: $i: (grandparent_THFTYPE_IioI@lJohn_THFTYPE_i@x))@n
∀x: $i, y: $i: ((grandchild_THFTYPE_IioI@x@y) ⇔ ∃z: $i: (parent_THFTYPE_IioI@z@x and parent_THFTYPE_IioI@y
∃y: $i: (ltet_THFTYPE_IioI@(lCardinalityFn_THFTYPE_IioIiI@λx: $i: (grandchild_THFTYPE_IioI@x@lJohn_THFTYPE

```

CSR151^1.p Is it the case that in 2009 Sue liked Bill and Mary liked Bill?

During 2009 Mary liked Bill and Sue liked Bill. Is it the case that in 2009 Sue liked Bill and Mary liked Bill?

```

num: $tType   thf(numbers, type)
holdsDuring_THFTYPE_IioI: $i → $o → $o   thf(holdsDuring_THFTYPE_IioI, type)
lBill_THFTYPE_i: $i   thf(lBill_THFTYPE_i, type)
lMary_THFTYPE_i: $i   thf(lMary_THFTYPE_i, type)

```

```

lSue_THFTYPE_i: $i    thf(lSue_THFTYPE_i, type)
lYearFn_THFTYPE_III: $i → $i    thf(lYearFn_THFTYPE_III, type)
likes_THFTYPE_IioI: $i → $i → $o    thf(likes_THFTYPE_IioI, type)
n2009_THFTYPE_i: $i    thf(n2009_THFTYPE_i, type)
holdsDuring_THFTYPE_IioI@(lYearFn_THFTYPE_III@n2009_THFTYPE_i)@(likes_THFTYPE_IioI@lMary_THFTYPE_i)
holdsDuring_THFTYPE_IioI@(lYearFn_THFTYPE_III@n2009_THFTYPE_i)@(likes_THFTYPE_IioI@lSue_THFTYPE_i)

```

CSR151^3.p Did someone like Bill in 2009?

During 2009 Mary liked Bill and Sue liked Bill. Is it the case that someone liked Bill during 2009?

```
include('Axioms/CSR005^0.ax')
```

```

lBill_THFTYPE_i: $i    thf(lBill_THFTYPE_i, type)
lMary_THFTYPE_i: $i    thf(lMary_THFTYPE_i, type)
lSue_THFTYPE_i: $i    thf(lSue_THFTYPE_i, type)
likes_THFTYPE_IioI: $i → $i → $o    thf(likes_THFTYPE_IioI, type)
n2009_THFTYPE_i: $i    thf(n2009_THFTYPE_i, type)
holdsDuring_THFTYPE_IioI@(lYearFn_THFTYPE_III@n2009_THFTYPE_i)@(likes_THFTYPE_IioI@lMary_THFTYPE_i)
holdsDuring_THFTYPE_IioI@(lYearFn_THFTYPE_III@n2009_THFTYPE_i)@(likes_THFTYPE_IioI@lSue_THFTYPE_i)

```

CSR152^1.p Does Chris know that Sue likes Bill?

Everybody knows that Chris is equal to Chris. Mary likes Bill. Chris knows that Sue likes whoever Mary likes. Does Chris know that Sue likes Bill?

```

num: $tType    thf(numbers, type)
knows_THFTYPE_IioI: $i → $o → $o    thf(knows_THFTYPE_IioI, type)
lBill_THFTYPE_i: $i    thf(lBill_THFTYPE_i, type)
lChris_THFTYPE_i: $i    thf(lChris_THFTYPE_i, type)
lMary_THFTYPE_i: $i    thf(lMary_THFTYPE_i, type)
lSue_THFTYPE_i: $i    thf(lSue_THFTYPE_i, type)
likes_THFTYPE_IioI: $i → $i → $o    thf(likes_THFTYPE_IioI, type)
knows_THFTYPE_IioI@lChris_THFTYPE_i@lChris_THFTYPE_i = lChris_THFTYPE_i    thf(ax, axiom)
likes_THFTYPE_IioI@lMary_THFTYPE_i@lBill_THFTYPE_i    thf(ax001, axiom)
knows_THFTYPE_IioI@lChris_THFTYPE_i@∀x: $i: ((likes_THFTYPE_IioI@lMary_THFTYPE_i@x) ⇒ (likes_THFTYPE_IioI@lSue_THFTYPE_i@x))
knows_THFTYPE_IioI@lChris_THFTYPE_i@(likes_THFTYPE_IioI@lSue_THFTYPE_i@lBill_THFTYPE_i)    thf(con, co

```

CSR152^3.p Did someone like Bill in 2009?

During 2009 Mary liked Bill and Sue liked Bill. Is it the case that someone liked Bill during 2009?

```
include('Axioms/CSR005^0.ax')
```

```

lBill_THFTYPE_i: $i    thf(lBill_THFTYPE_i, type)
lChris_THFTYPE_i: $i    thf(lChris_THFTYPE_i, type)
lMary_THFTYPE_i: $i    thf(lMary_THFTYPE_i, type)
lSue_THFTYPE_i: $i    thf(lSue_THFTYPE_i, type)
likes_THFTYPE_IioI: $i → $i → $o    thf(likes_THFTYPE_IioI, type)
knows_THFTYPE_IioI@lChris_THFTYPE_i@lChris_THFTYPE_i = lChris_THFTYPE_i    thf(ax, axiom)
likes_THFTYPE_IioI@lMary_THFTYPE_i@lBill_THFTYPE_i    thf(ax001, axiom)
knows_THFTYPE_IioI@lChris_THFTYPE_i@∀x: $i: ((likes_THFTYPE_IioI@lMary_THFTYPE_i@x) ⇒ (likes_THFTYPE_IioI@lSue_THFTYPE_i@x))
knows_THFTYPE_IioI@lChris_THFTYPE_i@(likes_THFTYPE_IioI@lSue_THFTYPE_i@lBill_THFTYPE_i)    thf(con, co

```

CSR153^1.p Is there a common relation?

Mary, Sue, Bill and Bob are mutually distinct. Mary is neither a sister of Sue nor of Bill. Bob is not a brother of Mary. Sue is a sister of Bill and of Bob. Bob is a brother of Bill. Is there a relation that holds both between Bob and Bill and between Sue and Bob?

```

num: $tType    thf(numbers, type)
brother_THFTYPE_IioI: $i → $i → $o    thf(brother_THFTYPE_IioI, type)
lBill_THFTYPE_i: $i    thf(lBill_THFTYPE_i, type)
lBob_THFTYPE_i: $i    thf(lBob_THFTYPE_i, type)
lMary_THFTYPE_i: $i    thf(lMary_THFTYPE_i, type)
lSue_THFTYPE_i: $i    thf(lSue_THFTYPE_i, type)
sister_THFTYPE_IioI: $i → $i → $o    thf(sister_THFTYPE_IioI, type)
sister_THFTYPE_IioI@lSue_THFTYPE_i@lBill_THFTYPE_i and sister_THFTYPE_IioI@lSue_THFTYPE_i@lBob_THFTYPE_i
¬@lMary_THFTYPE_i = lSue_THFTYPE_i and ¬@lMary_THFTYPE_i = lBill_THFTYPE_i and ¬@lBob_THFTYPE_i =
lMary_THFTYPE_i    thf(ax001, axiom)
¬@lSue_THFTYPE_i = lBill_THFTYPE_i and ¬@lSue_THFTYPE_i = lBob_THFTYPE_i    thf(ax002, axiom)

```

```

¬@(sister_THFTYPE_IioI@lMary_THFTYPE_i@lSue_THFTYPE_i) and ¬@(sister_THFTYPE_IioI@lMary_THFTYPE_i@
¬@lBob_THFTYPE_i = lBill_THFTYPE_i      thf(ax004, axiom)
∃r: $i → $i → $o: (r@lBob_THFTYPE_i@lBill_THFTYPE_i and r@lSue_THFTYPE_i@lBob_THFTYPE_i and ¬@∀x: $i, y: $
CSR153^3.p Did someone like Bill in 2009?
During 2009 Mary liked Bill and Sue liked Bill. Is it the case that someone liked Bill during 2009?
include('Axioms/CSR005^0.ax')
brother_THFTYPE_IioI: $i → $i → $o      thf(brother_THFTYPE_IioI, type)
lBill_THFTYPE_i: $i      thf(lBill_THFTYPE_i, type)
lBob_THFTYPE_i: $i      thf(lBob_THFTYPE_i, type)
lMary_THFTYPE_i: $i      thf(lMary_THFTYPE_i, type)
lSue_THFTYPE_i: $i      thf(lSue_THFTYPE_i, type)
sister_THFTYPE_IioI: $i → $i → $o      thf(sister_THFTYPE_IioI, type)
sister_THFTYPE_IioI@lSue_THFTYPE_i@lBill_THFTYPE_i and sister_THFTYPE_IioI@lSue_THFTYPE_i@lBob_THFTY
¬@lMary_THFTYPE_i = lSue_THFTYPE_i and ¬@lMary_THFTYPE_i = lBill_THFTYPE_i and ¬@lBob_THFTYPE_i =
lMary_THFTYPE_i      thf(ax001, axiom)
¬@lSue_THFTYPE_i = lBill_THFTYPE_i and ¬@lSue_THFTYPE_i = lBob_THFTYPE_i      thf(ax002, axiom)
¬@(sister_THFTYPE_IioI@lMary_THFTYPE_i@lSue_THFTYPE_i) and ¬@(sister_THFTYPE_IioI@lMary_THFTYPE_i@
¬@lBob_THFTYPE_i = lBill_THFTYPE_i      thf(ax004, axiom)
∃r: $i → $i → $o: (r@lBob_THFTYPE_i@lBill_THFTYPE_i and r@lSue_THFTYPE_i@lBob_THFTYPE_i and ¬@∀x: $i, y: $
CSR154+1.p Standard discrete event calculus axioms
include('Axioms/CSR001+0.ax')
CSR155+1.p LogAnswer
include('Axioms/CSR004+0.ax')

```