

# NLP axioms

## NLP problems

**NLP001+1.p** "The old dirty white Chevy" problem

A problem generated by the DORIS [Bos00] system when parsing the statement "The old dirty white Chevy barrels down a lonely street in Hollywood".

$(\exists u, v, w, x$ : (hollywood( $u$ ) and city( $u$ ) and event( $v$ ) and street( $w$ ) and way( $w$ ) and lonely( $w$ ) and chevy( $x$ ) and car( $x$ ) and v

$\exists y, z, x_1, x_2$ : (hollywood( $y$ ) and city( $y$ ) and event( $z$ ) and chevy( $x_1$ ) and car( $x_1$ ) and white( $x_1$ ) and dirty( $x_1$ ) and old( $x_1$ ) and

$\exists x_7, x_8, x_9, x_{10}$ : (hollywood( $x_7$ ) and city( $x_7$ ) and event( $x_8$ ) and street( $x_9$ ) and way( $x_9$ ) and lonely( $x_9$ ) and chevy( $x_{10}$ ) and c

**NLP001-1.p** "The old dirty white Chevy" problem

A problem generated by the DORIS [Bos00] system when parsing the statement "The old dirty white Chevy barrels down a lonely street in Hollywood".

hollywood(sk<sub>c15</sub>) cnf(clause<sub>1</sub>, negated\_conjecture)

event(sk<sub>c14</sub>) cnf(clause<sub>2</sub>, negated\_conjecture)

street(sk<sub>c13</sub>) cnf(clause<sub>3</sub>, negated\_conjecture)

old(sk<sub>c12</sub>) cnf(clause<sub>4</sub>, negated\_conjecture)

hollywood(sk<sub>c11</sub>) cnf(clause<sub>5</sub>, negated\_conjecture)

event(sk<sub>c10</sub>) cnf(clause<sub>6</sub>, negated\_conjecture)

chevy(sk<sub>c9</sub>) cnf(clause<sub>7</sub>, negated\_conjecture)

lonely(sk<sub>c8</sub>) cnf(clause<sub>8</sub>, negated\_conjecture)

ssSkC<sub>0</sub> or chevy(sk<sub>c12</sub>) cnf(clause<sub>9</sub>, negated\_conjecture)

ssSkC<sub>0</sub> or car(sk<sub>c12</sub>) cnf(clause<sub>10</sub>, negated\_conjecture)

ssSkC<sub>0</sub> or white(sk<sub>c12</sub>) cnf(clause<sub>11</sub>, negated\_conjecture)

ssSkC<sub>0</sub> or dirty(sk<sub>c12</sub>) cnf(clause<sub>12</sub>, negated\_conjecture)

ssSkC<sub>0</sub> or lonely(sk<sub>c13</sub>) cnf(clause<sub>13</sub>, negated\_conjecture)

ssSkC<sub>0</sub> or way(sk<sub>c13</sub>) cnf(clause<sub>14</sub>, negated\_conjecture)

ssSkC<sub>0</sub> or city(sk<sub>c15</sub>) cnf(clause<sub>15</sub>, negated\_conjecture)

ssSkC<sub>0</sub>  $\Rightarrow$  street(sk<sub>c8</sub>) cnf(clause<sub>16</sub>, negated\_conjecture)

ssSkC<sub>0</sub>  $\Rightarrow$  way(sk<sub>c8</sub>) cnf(clause<sub>17</sub>, negated\_conjecture)

ssSkC<sub>0</sub>  $\Rightarrow$  old(sk<sub>c9</sub>) cnf(clause<sub>18</sub>, negated\_conjecture)

ssSkC<sub>0</sub>  $\Rightarrow$  dirty(sk<sub>c9</sub>) cnf(clause<sub>19</sub>, negated\_conjecture)

ssSkC<sub>0</sub>  $\Rightarrow$  white(sk<sub>c9</sub>) cnf(clause<sub>20</sub>, negated\_conjecture)

ssSkC<sub>0</sub>  $\Rightarrow$  car(sk<sub>c9</sub>) cnf(clause<sub>21</sub>, negated\_conjecture)

ssSkC<sub>0</sub>  $\Rightarrow$  city(sk<sub>c11</sub>) cnf(clause<sub>22</sub>, negated\_conjecture)

ssSkC<sub>0</sub> or barrel(sk<sub>c14</sub>, sk<sub>c12</sub>) cnf(clause<sub>23</sub>, negated\_conjecture)

ssSkC<sub>0</sub> or down(sk<sub>c14</sub>, sk<sub>c13</sub>) cnf(clause<sub>24</sub>, negated\_conjecture)

ssSkC<sub>0</sub> or in(sk<sub>c14</sub>, sk<sub>c15</sub>) cnf(clause<sub>25</sub>, negated\_conjecture)

ssSkC<sub>0</sub>  $\Rightarrow$  barrel(sk<sub>c10</sub>, sk<sub>c9</sub>) cnf(clause<sub>26</sub>, negated\_conjecture)

ssSkC<sub>0</sub>  $\Rightarrow$  down(sk<sub>c10</sub>, sk<sub>c8</sub>) cnf(clause<sub>27</sub>, negated\_conjecture)

ssSkC<sub>0</sub>  $\Rightarrow$  in(sk<sub>c10</sub>, sk<sub>c11</sub>) cnf(clause<sub>28</sub>, negated\_conjecture)

(street( $u$ ) and way( $u$ ) and lonely( $u$ ) and old( $v$ ) and dirty( $v$ ) and white( $v$ ) and car( $v$ ) and chevy( $v$ ) and event( $w$ ) and barrel

ssSkC<sub>0</sub> cnf(clause<sub>29</sub>, negated\_conjecture)

(chevy( $u$ ) and car( $u$ ) and white( $u$ ) and dirty( $u$ ) and old( $u$ ) and lonely( $v$ ) and way( $v$ ) and street( $v$ ) and event( $w$ ) and barrel

$\neg$ ssSkC<sub>0</sub> cnf(clause<sub>30</sub>, negated\_conjecture)

**NLP002+1.p** "The old dirty white Chevy" problem 2

A problem generated by the DORIS [Bos00] system when parsing the statement "The old dirty white Chevy barrels down a lonely street in Hollywood".

$\forall u$ : (chevy( $u$ )  $\Rightarrow$  car( $u$ )) fof(ax<sub>1</sub>, axiom)

$\forall u$ : (car( $u$ )  $\Rightarrow$  vehicle( $u$ )) fof(ax<sub>2</sub>, axiom)

$\forall u$ : (vehicle( $u$ )  $\Rightarrow$  transport( $u$ )) fof(ax<sub>3</sub>, axiom)

$\forall u$ : (transport( $u$ )  $\Rightarrow$  instrumentality( $u$ )) fof(ax<sub>4</sub>, axiom)

$\forall u$ : (instrumentality( $u$ )  $\Rightarrow$  artifact( $u$ )) fof(ax<sub>5</sub>, axiom)

$\forall u$ : (instrumentality( $u$ )  $\Rightarrow$   $\neg$  way( $u$ )) fof(ax<sub>6</sub>, axiom)

$\forall u$ : (street( $u$ )  $\Rightarrow$  way( $u$ )) fof(ax<sub>7</sub>, axiom)

$\forall u$ : (way( $u$ )  $\Rightarrow$  artifact( $u$ )) fof(ax<sub>8</sub>, axiom)

$\forall u$ : (artifact( $u$ )  $\Rightarrow$  object( $u$ )) fof(ax<sub>9</sub>, axiom)

$\forall u$ : (artifact( $u$ )  $\Rightarrow$   $\neg$  location( $u$ )) fof(ax<sub>10</sub>, axiom)

$\forall u: (\text{event}(u) \Rightarrow \text{eventuality}(u)) \quad \text{fof}(\text{ax}_{11}, \text{axiom})$   
 $\forall u: (\text{hollywood}(u) \Rightarrow \text{city}(u)) \quad \text{fof}(\text{ax}_{12}, \text{axiom})$   
 $\forall u: (\text{city}(u) \Rightarrow \text{location}(u)) \quad \text{fof}(\text{ax}_{13}, \text{axiom})$   
 $\forall u: (\text{location}(u) \Rightarrow \text{object}(u)) \quad \text{fof}(\text{ax}_{14}, \text{axiom})$   
 $\forall u: (\text{object}(u) \Rightarrow \text{entity}(u)) \quad \text{fof}(\text{ax}_{15}, \text{axiom})$   
 $\forall u: (\text{old}(u) \Rightarrow \neg \text{new}(u)) \quad \text{fof}(\text{ax}_{16}, \text{axiom})$   
 $\forall u: (\text{eventuality}(u) \Rightarrow \neg \text{entity}(u)) \quad \text{fof}(\text{ax}_{17}, \text{axiom})$   
 $\forall u: (\text{abstraction}(u) \Rightarrow \neg \text{entity}(u)) \quad \text{fof}(\text{ax}_{18}, \text{axiom})$   
 $\forall u: (\text{abstraction}(u) \Rightarrow \neg \text{eventuality}(u)) \quad \text{fof}(\text{ax}_{19}, \text{axiom})$   
 $\forall u: (\text{male}(u) \Rightarrow \neg \text{female}(u)) \quad \text{fof}(\text{ax}_{20}, \text{axiom})$   
 $\forall u: (\text{man}(u) \Rightarrow \neg \text{woman}(u)) \quad \text{fof}(\text{ax}_{21}, \text{axiom})$   
 $\forall u: (\text{man}(u) \Rightarrow \text{male}(u)) \quad \text{fof}(\text{ax}_{22}, \text{axiom})$   
 $\forall u: (\text{male}(u) \Rightarrow \text{human}(u)) \quad \text{fof}(\text{ax}_{23}, \text{axiom})$   
 $\forall u: (\text{female}(u) \Rightarrow \text{human}(u)) \quad \text{fof}(\text{ax}_{24}, \text{axiom})$   
 $\forall u: (\text{woman}(u) \Rightarrow \text{female}(u)) \quad \text{fof}(\text{ax}_{25}, \text{axiom})$   
 $\forall u: (\text{drs}(u) \iff \text{proposition}(u)) \quad \text{fof}(\text{ax}_{26}, \text{axiom})$   
 $\forall u: (\text{nonhuman}(u) \Rightarrow \text{entity}(u)) \quad \text{fof}(\text{ax}_{27}, \text{axiom})$   
 $\forall u: (\text{human}(u) \Rightarrow \neg \text{nonhuman}(u)) \quad \text{fof}(\text{ax}_{28}, \text{axiom})$   
 $\forall u, v, w: ((\text{have}(u, v, w) \text{ and } \text{human}(v)) \iff (\text{owner}(v) \text{ and } \text{of}(v, w))) \quad \text{fof}(\text{ax}_{29}, \text{axiom})$   
 $\forall u, v, w: ((\text{have}(u, v, w) \text{ and } \text{nonhuman}(v) \text{ and } \text{nonhuman}(w)) \Rightarrow \text{partof}(w, v)) \quad \text{fof}(\text{ax}_{30}, \text{axiom})$   
 $\forall u, v, w: ((\text{event}(u) \text{ and } \text{have}(u, v, w)) \Rightarrow \text{of}(v, w)) \quad \text{fof}(\text{ax}_{31}, \text{axiom})$   
 $\forall u, v: (\text{of}(v, u) \Rightarrow \exists w: (\text{event}(w) \text{ and } \text{have}(w, u, v))) \quad \text{fof}(\text{ax}_{32}, \text{axiom})$   
 $\forall u, v, w: ((\text{partof}(u, v) \text{ and } \text{partof}(u, w)) \Rightarrow v = w) \quad \text{fof}(\text{ax}_{33}, \text{axiom})$   
 $\neg \exists u, v, w, x: (\text{hollywood}(u) \text{ and } \text{city}(u) \text{ and } \text{event}(v) \text{ and } \text{street}(w) \text{ and } \text{way}(w) \text{ and } \text{lonely}(w) \text{ and } \text{chevy}(x) \text{ and } \text{car}(x) \text{ and } \dots)$

### NLP002-1.p "The old dirty white Chevy" problem 2

A problem generated by the DORIS [Bos00] system when parsing the statement "The old dirty white Chevy barrels down a lonely street in Hollywood".

$\text{event}(\text{skf}_1(u, v)) \quad \text{cnf}(\text{clause}_1, \text{axiom})$   
 $\text{nonhuman}(u) \Rightarrow \text{entity}(u) \quad \text{cnf}(\text{clause}_2, \text{axiom})$   
 $\text{drs}(u) \Rightarrow \text{proposition}(u) \quad \text{cnf}(\text{clause}_3, \text{axiom})$   
 $\text{proposition}(u) \Rightarrow \text{drs}(u) \quad \text{cnf}(\text{clause}_4, \text{axiom})$   
 $\text{woman}(u) \Rightarrow \text{female}(u) \quad \text{cnf}(\text{clause}_5, \text{axiom})$   
 $\text{female}(u) \Rightarrow \text{human}(u) \quad \text{cnf}(\text{clause}_6, \text{axiom})$   
 $\text{male}(u) \Rightarrow \text{human}(u) \quad \text{cnf}(\text{clause}_7, \text{axiom})$   
 $\text{man}(u) \Rightarrow \text{male}(u) \quad \text{cnf}(\text{clause}_8, \text{axiom})$   
 $\text{object}(u) \Rightarrow \text{entity}(u) \quad \text{cnf}(\text{clause}_9, \text{axiom})$   
 $\text{location}(u) \Rightarrow \text{object}(u) \quad \text{cnf}(\text{clause}_{10}, \text{axiom})$   
 $\text{city}(u) \Rightarrow \text{location}(u) \quad \text{cnf}(\text{clause}_{11}, \text{axiom})$   
 $\text{hollywood}(u) \Rightarrow \text{city}(u) \quad \text{cnf}(\text{clause}_{12}, \text{axiom})$   
 $\text{event}(u) \Rightarrow \text{eventuality}(u) \quad \text{cnf}(\text{clause}_{13}, \text{axiom})$   
 $\text{artifact}(u) \Rightarrow \text{object}(u) \quad \text{cnf}(\text{clause}_{14}, \text{axiom})$   
 $\text{way}(u) \Rightarrow \text{artifact}(u) \quad \text{cnf}(\text{clause}_{15}, \text{axiom})$   
 $\text{street}(u) \Rightarrow \text{way}(u) \quad \text{cnf}(\text{clause}_{16}, \text{axiom})$   
 $\text{instrumentality}(u) \Rightarrow \text{artifact}(u) \quad \text{cnf}(\text{clause}_{17}, \text{axiom})$   
 $\text{transport}(u) \Rightarrow \text{instrumentality}(u) \quad \text{cnf}(\text{clause}_{18}, \text{axiom})$   
 $\text{vehicle}(u) \Rightarrow \text{transport}(u) \quad \text{cnf}(\text{clause}_{19}, \text{axiom})$   
 $\text{car}(u) \Rightarrow \text{vehicle}(u) \quad \text{cnf}(\text{clause}_{20}, \text{axiom})$   
 $\text{chevy}(u) \Rightarrow \text{car}(u) \quad \text{cnf}(\text{clause}_{21}, \text{axiom})$   
 $\text{nonhuman}(u) \Rightarrow \neg \text{human}(u) \quad \text{cnf}(\text{clause}_{22}, \text{axiom})$   
 $\text{woman}(u) \Rightarrow \neg \text{man}(u) \quad \text{cnf}(\text{clause}_{23}, \text{axiom})$   
 $\text{female}(u) \Rightarrow \neg \text{male}(u) \quad \text{cnf}(\text{clause}_{24}, \text{axiom})$   
 $\text{eventuality}(u) \Rightarrow \neg \text{abstraction}(u) \quad \text{cnf}(\text{clause}_{25}, \text{axiom})$   
 $\text{entity}(u) \Rightarrow \neg \text{abstraction}(u) \quad \text{cnf}(\text{clause}_{26}, \text{axiom})$   
 $\text{entity}(u) \Rightarrow \neg \text{eventuality}(u) \quad \text{cnf}(\text{clause}_{27}, \text{axiom})$   
 $\text{new}(u) \Rightarrow \neg \text{old}(u) \quad \text{cnf}(\text{clause}_{28}, \text{axiom})$   
 $\text{location}(u) \Rightarrow \neg \text{artifact}(u) \quad \text{cnf}(\text{clause}_{29}, \text{axiom})$   
 $\text{way}(u) \Rightarrow \neg \text{instrumentality}(u) \quad \text{cnf}(\text{clause}_{30}, \text{axiom})$   
 $(\text{owner}(u) \text{ and } \text{of}(u, v)) \Rightarrow \text{human}(u) \quad \text{cnf}(\text{clause}_{31}, \text{axiom})$   
 $\text{of}(u, v) \Rightarrow \text{have}(\text{skf}_1(u, v), v, u) \quad \text{cnf}(\text{clause}_{32}, \text{axiom})$

$(\text{human}(u) \text{ and } \text{have}(v, u, w)) \Rightarrow \text{owner}(u)$      $\text{cnf}(\text{clause}_{33}, \text{axiom})$   
 $(\text{partof}(u, v) \text{ and } \text{partof}(u, w)) \Rightarrow w = v$      $\text{cnf}(\text{clause}_{34}, \text{axiom})$   
 $(\text{have}(u, v, w) \text{ and } \text{event}(u)) \Rightarrow \text{of}(v, w)$      $\text{cnf}(\text{clause}_{35}, \text{axiom})$   
 $(\text{human}(u) \text{ and } \text{have}(v, u, w)) \Rightarrow \text{of}(u, w)$      $\text{cnf}(\text{clause}_{36}, \text{axiom})$   
 $(\text{owner}(u) \text{ and } \text{of}(u, v)) \Rightarrow \text{have}(w, u, v)$      $\text{cnf}(\text{clause}_{37}, \text{axiom})$   
 $(\text{nonhuman}(u) \text{ and } \text{nonhuman}(v) \text{ and } \text{have}(w, v, u)) \Rightarrow \text{partof}(u, v)$      $\text{cnf}(\text{clause}_{38}, \text{axiom})$   
 $\text{hollywood}(\text{skc}_7)$      $\text{cnf}(\text{clause}_{39}, \text{negated\_conjecture})$   
 $\text{city}(\text{skc}_7)$      $\text{cnf}(\text{clause}_{40}, \text{negated\_conjecture})$   
 $\text{event}(\text{skc}_6)$      $\text{cnf}(\text{clause}_{41}, \text{negated\_conjecture})$   
 $\text{street}(\text{skc}_5)$      $\text{cnf}(\text{clause}_{42}, \text{negated\_conjecture})$   
 $\text{way}(\text{skc}_5)$      $\text{cnf}(\text{clause}_{43}, \text{negated\_conjecture})$   
 $\text{lonely}(\text{skc}_5)$      $\text{cnf}(\text{clause}_{44}, \text{negated\_conjecture})$   
 $\text{old}(\text{skc}_4)$      $\text{cnf}(\text{clause}_{45}, \text{negated\_conjecture})$   
 $\text{dirty}(\text{skc}_4)$      $\text{cnf}(\text{clause}_{46}, \text{negated\_conjecture})$   
 $\text{white}(\text{skc}_4)$      $\text{cnf}(\text{clause}_{47}, \text{negated\_conjecture})$   
 $\text{car}(\text{skc}_4)$      $\text{cnf}(\text{clause}_{48}, \text{negated\_conjecture})$   
 $\text{chevy}(\text{skc}_4)$      $\text{cnf}(\text{clause}_{49}, \text{negated\_conjecture})$   
 $\text{in}(\text{skc}_6, \text{skc}_7)$      $\text{cnf}(\text{clause}_{50}, \text{negated\_conjecture})$   
 $\text{down}(\text{skc}_6, \text{skc}_5)$      $\text{cnf}(\text{clause}_{51}, \text{negated\_conjecture})$   
 $\text{barrel}(\text{skc}_6, \text{skc}_4)$      $\text{cnf}(\text{clause}_{52}, \text{negated\_conjecture})$

### NLP003+1.p "The old dirty white Chevy" problem 3

A problem generated by the DORIS [Bos00] system when parsing the statement "The old dirty white Chevy barrels down a lonely street in Hollywood".

$\forall u: (\text{chevy}(u) \Rightarrow \text{car}(u))$      $\text{fof}(\text{ax}_1, \text{axiom})$   
 $\forall u: (\text{car}(u) \Rightarrow \text{vehicle}(u))$      $\text{fof}(\text{ax}_2, \text{axiom})$   
 $\forall u: (\text{vehicle}(u) \Rightarrow \text{transport}(u))$      $\text{fof}(\text{ax}_3, \text{axiom})$   
 $\forall u: (\text{transport}(u) \Rightarrow \text{instrumentality}(u))$      $\text{fof}(\text{ax}_4, \text{axiom})$   
 $\forall u: (\text{instrumentality}(u) \Rightarrow \text{artifact}(u))$      $\text{fof}(\text{ax}_5, \text{axiom})$   
 $\forall u: (\text{instrumentality}(u) \Rightarrow \neg \text{way}(u))$      $\text{fof}(\text{ax}_6, \text{axiom})$   
 $\forall u: (\text{street}(u) \Rightarrow \text{way}(u))$      $\text{fof}(\text{ax}_7, \text{axiom})$   
 $\forall u: (\text{way}(u) \Rightarrow \text{artifact}(u))$      $\text{fof}(\text{ax}_8, \text{axiom})$   
 $\forall u: (\text{artifact}(u) \Rightarrow \text{object}(u))$      $\text{fof}(\text{ax}_9, \text{axiom})$   
 $\forall u: (\text{artifact}(u) \Rightarrow \neg \text{location}(u))$      $\text{fof}(\text{ax}_{10}, \text{axiom})$   
 $\forall u: (\text{event}(u) \Rightarrow \text{eventuality}(u))$      $\text{fof}(\text{ax}_{11}, \text{axiom})$   
 $\forall u: (\text{hollywood}(u) \Rightarrow \text{city}(u))$      $\text{fof}(\text{ax}_{12}, \text{axiom})$   
 $\forall u: (\text{city}(u) \Rightarrow \text{location}(u))$      $\text{fof}(\text{ax}_{13}, \text{axiom})$   
 $\forall u: (\text{location}(u) \Rightarrow \text{object}(u))$      $\text{fof}(\text{ax}_{14}, \text{axiom})$   
 $\forall u: (\text{object}(u) \Rightarrow \text{entity}(u))$      $\text{fof}(\text{ax}_{15}, \text{axiom})$   
 $\forall u: (\text{old}(u) \Rightarrow \neg \text{new}(u))$      $\text{fof}(\text{ax}_{16}, \text{axiom})$   
 $\forall u: (\text{eventuality}(u) \Rightarrow \neg \text{entity}(u))$      $\text{fof}(\text{ax}_{17}, \text{axiom})$   
 $\forall u: (\text{abstraction}(u) \Rightarrow \neg \text{entity}(u))$      $\text{fof}(\text{ax}_{18}, \text{axiom})$   
 $\forall u: (\text{abstraction}(u) \Rightarrow \neg \text{eventuality}(u))$      $\text{fof}(\text{ax}_{19}, \text{axiom})$   
 $\forall u: (\text{male}(u) \Rightarrow \neg \text{female}(u))$      $\text{fof}(\text{ax}_{20}, \text{axiom})$   
 $\forall u: (\text{man}(u) \Rightarrow \neg \text{woman}(u))$      $\text{fof}(\text{ax}_{21}, \text{axiom})$   
 $\forall u: (\text{man}(u) \Rightarrow \text{male}(u))$      $\text{fof}(\text{ax}_{22}, \text{axiom})$   
 $\forall u: (\text{male}(u) \Rightarrow \text{human}(u))$      $\text{fof}(\text{ax}_{23}, \text{axiom})$   
 $\forall u: (\text{female}(u) \Rightarrow \text{human}(u))$      $\text{fof}(\text{ax}_{24}, \text{axiom})$   
 $\forall u: (\text{woman}(u) \Rightarrow \text{female}(u))$      $\text{fof}(\text{ax}_{25}, \text{axiom})$   
 $\forall u: (\text{drs}(u) \iff \text{proposition}(u))$      $\text{fof}(\text{ax}_{26}, \text{axiom})$   
 $\forall u: (\text{nonhuman}(u) \Rightarrow \text{entity}(u))$      $\text{fof}(\text{ax}_{27}, \text{axiom})$   
 $\forall u: (\text{human}(u) \Rightarrow \neg \text{nonhuman}(u))$      $\text{fof}(\text{ax}_{28}, \text{axiom})$   
 $\forall u, v, w: ((\text{have}(u, v, w) \text{ and } \text{human}(v)) \iff (\text{owner}(v) \text{ and } \text{of}(v, w)))$      $\text{fof}(\text{ax}_{29}, \text{axiom})$   
 $\forall u, v, w: ((\text{have}(u, v, w) \text{ and } \text{nonhuman}(v) \text{ and } \text{nonhuman}(w)) \Rightarrow \text{partof}(w, v))$      $\text{fof}(\text{ax}_{30}, \text{axiom})$   
 $\forall u, v, w: ((\text{event}(u) \text{ and } \text{have}(u, v, w)) \Rightarrow \text{of}(v, w))$      $\text{fof}(\text{ax}_{31}, \text{axiom})$   
 $\forall u, v: (\text{of}(v, u) \Rightarrow \exists w: (\text{event}(w) \text{ and } \text{have}(w, u, v)))$      $\text{fof}(\text{ax}_{32}, \text{axiom})$   
 $\forall u, v, w: ((\text{partof}(u, v) \text{ and } \text{partof}(u, w)) \Rightarrow v = w)$      $\text{fof}(\text{ax}_{33}, \text{axiom})$   
 $\neg \exists u, v, w, x: (\text{hollywood}(u) \text{ and } \text{city}(u) \text{ and } \text{event}(v) \text{ and } \text{chevy}(w) \text{ and } \text{car}(w) \text{ and } \text{white}(w) \text{ and } \text{dirty}(w) \text{ and } \text{old}(w) \text{ and } \text{barrel}(w, x))$

### NLP003-1.p "The old dirty white Chevy" problem 3

A problem generated by the DORIS [Bos00] system when parsing the statement "The old dirty white Chevy barrels down a lonely street in Hollywood".

```

event(skf1(u, v))    cnf(clause1, axiom)
nonhuman(u) ⇒ entity(u)    cnf(clause2, axiom)
drs(u) ⇒ proposition(u)    cnf(clause3, axiom)
proposition(u) ⇒ drs(u)    cnf(clause4, axiom)
woman(u) ⇒ female(u)    cnf(clause5, axiom)
female(u) ⇒ human(u)    cnf(clause6, axiom)
male(u) ⇒ human(u)    cnf(clause7, axiom)
man(u) ⇒ male(u)    cnf(clause8, axiom)
object(u) ⇒ entity(u)    cnf(clause9, axiom)
location(u) ⇒ object(u)    cnf(clause10, axiom)
city(u) ⇒ location(u)    cnf(clause11, axiom)
hollywood(u) ⇒ city(u)    cnf(clause12, axiom)
event(u) ⇒ eventuality(u)    cnf(clause13, axiom)
artifact(u) ⇒ object(u)    cnf(clause14, axiom)
way(u) ⇒ artifact(u)    cnf(clause15, axiom)
street(u) ⇒ way(u)    cnf(clause16, axiom)
instrumentality(u) ⇒ artifact(u)    cnf(clause17, axiom)
transport(u) ⇒ instrumentality(u)    cnf(clause18, axiom)
vehicle(u) ⇒ transport(u)    cnf(clause19, axiom)
car(u) ⇒ vehicle(u)    cnf(clause20, axiom)
chevy(u) ⇒ car(u)    cnf(clause21, axiom)
nonhuman(u) ⇒ ¬ human(u)    cnf(clause22, axiom)
woman(u) ⇒ ¬ man(u)    cnf(clause23, axiom)
female(u) ⇒ ¬ male(u)    cnf(clause24, axiom)
eventuality(u) ⇒ ¬ abstraction(u)    cnf(clause25, axiom)
entity(u) ⇒ ¬ abstraction(u)    cnf(clause26, axiom)
entity(u) ⇒ ¬ eventuality(u)    cnf(clause27, axiom)
new(u) ⇒ ¬ old(u)    cnf(clause28, axiom)
location(u) ⇒ ¬ artifact(u)    cnf(clause29, axiom)
way(u) ⇒ ¬ instrumentality(u)    cnf(clause30, axiom)
(owner(u) and of(u, v)) ⇒ human(u)    cnf(clause31, axiom)
of(u, v) ⇒ have(skf1(u, v), v, u)    cnf(clause32, axiom)
(human(u) and have(v, u, w)) ⇒ owner(u)    cnf(clause33, axiom)
(partof(u, v) and partof(u, w)) ⇒ w = v    cnf(clause34, axiom)
(have(u, v, w) and event(u)) ⇒ of(v, w)    cnf(clause35, axiom)
(human(u) and have(v, u, w)) ⇒ of(u, w)    cnf(clause36, axiom)
(owner(u) and of(u, v)) ⇒ have(w, u, v)    cnf(clause37, axiom)
(nonhuman(u) and nonhuman(v) and have(w, v, u)) ⇒ partof(u, v)    cnf(clause38, axiom)
hollywood(sk7)    cnf(clause39, negated_conjecture)
city(sk7)    cnf(clause40, negated_conjecture)
event(sk6)    cnf(clause41, negated_conjecture)
chevy(sk5)    cnf(clause42, negated_conjecture)
car(sk5)    cnf(clause43, negated_conjecture)
white(sk5)    cnf(clause44, negated_conjecture)
dirty(sk5)    cnf(clause45, negated_conjecture)
old(sk5)    cnf(clause46, negated_conjecture)
lonely(sk4)    cnf(clause47, negated_conjecture)
way(sk4)    cnf(clause48, negated_conjecture)
street(sk4)    cnf(clause49, negated_conjecture)
in(sk6, sk7)    cnf(clause50, negated_conjecture)
down(sk6, sk4)    cnf(clause51, negated_conjecture)
barrel(sk6, sk5)    cnf(clause52, negated_conjecture)

```

#### NLP004+1.p "The old dirty white Chevy" problem 4

A problem generated by the DORIS [Bos00] system when parsing the statement "The old dirty white Chevy barrels down a lonely street in Hollywood".

$(\exists u, v, w, x, y, z, x_1, x_2, x_4, x_5: \text{seat}(u) \text{ and furniture}(u) \text{ and front}(u) \text{ and seat}(v) \text{ and furniture}(v) \text{ and front}(v) \text{ and hollywo}$   
 $x_2 \text{ and fellow}(x_1) \text{ and man}(x_1) \text{ and young}(x_1) \text{ and fellow}(x_2) \text{ and man}(x_2) \text{ and young}(x_2) \text{ and } x_1 = x_4 \text{ and in}(x_4, u) \text{ and } x_2$





actual\_world(sk<sub>c11</sub>)      cnf(clause<sub>2</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> or city(sk<sub>c17</sub>, sk<sub>c20</sub>)      cnf(clause<sub>3</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> or street(sk<sub>c17</sub>, sk<sub>c20</sub>)      cnf(clause<sub>4</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> or lonely(sk<sub>c17</sub>, sk<sub>c20</sub>)      cnf(clause<sub>5</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> or placename(sk<sub>c17</sub>, sk<sub>c21</sub>)      cnf(clause<sub>6</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> or hollywood\_placename(sk<sub>c17</sub>, sk<sub>c21</sub>)      cnf(clause<sub>7</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> or event(sk<sub>c17</sub>, sk<sub>c18</sub>)      cnf(clause<sub>8</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> or present(sk<sub>c17</sub>, sk<sub>c18</sub>)      cnf(clause<sub>9</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> or barrel(sk<sub>c17</sub>, sk<sub>c18</sub>)      cnf(clause<sub>10</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> or old(sk<sub>c17</sub>, sk<sub>c19</sub>)      cnf(clause<sub>11</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> or dirty(sk<sub>c17</sub>, sk<sub>c19</sub>)      cnf(clause<sub>12</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> or white(sk<sub>c17</sub>, sk<sub>c19</sub>)      cnf(clause<sub>13</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> or chevy(sk<sub>c17</sub>, sk<sub>c19</sub>)      cnf(clause<sub>14</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> ⇒ lonely(sk<sub>c11</sub>, sk<sub>c16</sub>)      cnf(clause<sub>15</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> ⇒ street(sk<sub>c11</sub>, sk<sub>c16</sub>)      cnf(clause<sub>16</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> ⇒ barrel(sk<sub>c11</sub>, sk<sub>c12</sub>)      cnf(clause<sub>17</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> ⇒ present(sk<sub>c11</sub>, sk<sub>c12</sub>)      cnf(clause<sub>18</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> ⇒ event(sk<sub>c11</sub>, sk<sub>c12</sub>)      cnf(clause<sub>19</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> ⇒ hollywood\_placename(sk<sub>c11</sub>, sk<sub>c14</sub>)      cnf(clause<sub>20</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> ⇒ placename(sk<sub>c11</sub>, sk<sub>c14</sub>)      cnf(clause<sub>21</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> ⇒ city(sk<sub>c11</sub>, sk<sub>c15</sub>)      cnf(clause<sub>22</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> ⇒ chevy(sk<sub>c11</sub>, sk<sub>c13</sub>)      cnf(clause<sub>23</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> ⇒ white(sk<sub>c11</sub>, sk<sub>c13</sub>)      cnf(clause<sub>24</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> ⇒ dirty(sk<sub>c11</sub>, sk<sub>c13</sub>)      cnf(clause<sub>25</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> ⇒ old(sk<sub>c11</sub>, sk<sub>c13</sub>)      cnf(clause<sub>26</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> or down(sk<sub>c17</sub>, sk<sub>c18</sub>, sk<sub>c20</sub>)      cnf(clause<sub>27</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> or in(sk<sub>c17</sub>, sk<sub>c18</sub>, sk<sub>c20</sub>)      cnf(clause<sub>28</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> or of(sk<sub>c17</sub>, sk<sub>c21</sub>, sk<sub>c20</sub>)      cnf(clause<sub>29</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> or agent(sk<sub>c17</sub>, sk<sub>c18</sub>, sk<sub>c19</sub>)      cnf(clause<sub>30</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> ⇒ down(sk<sub>c11</sub>, sk<sub>c12</sub>, sk<sub>c16</sub>)      cnf(clause<sub>31</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> ⇒ in(sk<sub>c11</sub>, sk<sub>c12</sub>, sk<sub>c15</sub>)      cnf(clause<sub>32</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> ⇒ of(sk<sub>c11</sub>, sk<sub>c14</sub>, sk<sub>c15</sub>)      cnf(clause<sub>33</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> ⇒ agent(sk<sub>c11</sub>, sk<sub>c12</sub>, sk<sub>c13</sub>)      cnf(clause<sub>34</sub>, negated\_conjecture)  
 (down(*u, v, w*) and lonely(*u, w*) and street(*u, w*) and barrel(*u, v*) and present(*u, v*) and event(*u, v*) and hollywood\_placename(*u, v*) and placename(*u, x*))  
 ssSkC<sub>0</sub>      cnf(clause<sub>35</sub>, negated\_conjecture)  
 (city(*u, v*) and street(*u, v*) and lonely(*u, v*) and down(*u, w, v*) and in(*u, w, v*) and placename(*u, x*) and hollywood\_placename(*u, v*))  
 ¬ ssSkC<sub>0</sub>      cnf(clause<sub>36</sub>, negated\_conjecture)

### NLP115+1.p An old dirty white Chevy, problem 2

Eliminating logically equivalent interpretations in the statement "An old dirty white chevy barrels down a lonely street in hollywood."

¬ ¬ (∃*u*: (actual\_world(*u*) and ∃*v, w, x, y*: (street(*u, v*) and lonely(*u, v*) and of(*u, w, x*) and city(*u, x*) and hollywood\_placename(*u, v*)) and ∃*z*: (actual\_world(*z*) and ∃*x<sub>1</sub>, x<sub>2</sub>, x<sub>3</sub>, x<sub>4</sub>, x<sub>5</sub>*: (of(*z, x<sub>2</sub>, x<sub>1</sub>*) and city(*z, x<sub>1</sub>*) and hollywood\_placename(*z, x<sub>2</sub>*) and placename(*z, x<sub>3</sub>*)) and ∃*u*: (actual\_world(*u*) and ∃*v, w, x, y*: (street(*u, v*) and lonely(*u, v*) and of(*u, w, x*) and city(*u, x*) and hollywood\_placename(*u, v*)))

### NLP115-1.p An old dirty white Chevy, problem 2

Eliminating logically equivalent interpretations in the statement "An old dirty white chevy barrels down a lonely street in hollywood."

actual\_world(sk<sub>c17</sub>)      cnf(clause<sub>1</sub>, negated\_conjecture)  
 actual\_world(sk<sub>c11</sub>)      cnf(clause<sub>2</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> or event(sk<sub>c17</sub>, sk<sub>c18</sub>)      cnf(clause<sub>3</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> or present(sk<sub>c17</sub>, sk<sub>c18</sub>)      cnf(clause<sub>4</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> or barrel(sk<sub>c17</sub>, sk<sub>c18</sub>)      cnf(clause<sub>5</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> or lonely(sk<sub>c17</sub>, sk<sub>c21</sub>)      cnf(clause<sub>6</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> or street(sk<sub>c17</sub>, sk<sub>c21</sub>)      cnf(clause<sub>7</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> or old(sk<sub>c17</sub>, sk<sub>c19</sub>)      cnf(clause<sub>8</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> or dirty(sk<sub>c17</sub>, sk<sub>c19</sub>)      cnf(clause<sub>9</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> or white(sk<sub>c17</sub>, sk<sub>c19</sub>)      cnf(clause<sub>10</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> or chevy(sk<sub>c17</sub>, sk<sub>c19</sub>)      cnf(clause<sub>11</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> or city(sk<sub>c17</sub>, sk<sub>c19</sub>)      cnf(clause<sub>12</sub>, negated\_conjecture)

$\text{ssSkC}_0$  or  $\text{hollywood\_placename}(\text{skc}_{17}, \text{skc}_{20})$   $\text{cnf}(\text{clause}_{13}, \text{negated\_conjecture})$   
 $\text{ssSkC}_0$  or  $\text{placename}(\text{skc}_{17}, \text{skc}_{20})$   $\text{cnf}(\text{clause}_{14}, \text{negated\_conjecture})$   
 $\text{ssSkC}_0 \Rightarrow \text{lonely}(\text{skc}_{11}, \text{skc}_{16})$   $\text{cnf}(\text{clause}_{15}, \text{negated\_conjecture})$   
 $\text{ssSkC}_0 \Rightarrow \text{street}(\text{skc}_{11}, \text{skc}_{16})$   $\text{cnf}(\text{clause}_{16}, \text{negated\_conjecture})$   
 $\text{ssSkC}_0 \Rightarrow \text{barrel}(\text{skc}_{11}, \text{skc}_{12})$   $\text{cnf}(\text{clause}_{17}, \text{negated\_conjecture})$   
 $\text{ssSkC}_0 \Rightarrow \text{present}(\text{skc}_{11}, \text{skc}_{12})$   $\text{cnf}(\text{clause}_{18}, \text{negated\_conjecture})$   
 $\text{ssSkC}_0 \Rightarrow \text{event}(\text{skc}_{11}, \text{skc}_{12})$   $\text{cnf}(\text{clause}_{19}, \text{negated\_conjecture})$   
 $\text{ssSkC}_0 \Rightarrow \text{hollywood\_placename}(\text{skc}_{11}, \text{skc}_{14})$   $\text{cnf}(\text{clause}_{20}, \text{negated\_conjecture})$   
 $\text{ssSkC}_0 \Rightarrow \text{placename}(\text{skc}_{11}, \text{skc}_{14})$   $\text{cnf}(\text{clause}_{21}, \text{negated\_conjecture})$   
 $\text{ssSkC}_0 \Rightarrow \text{city}(\text{skc}_{11}, \text{skc}_{15})$   $\text{cnf}(\text{clause}_{22}, \text{negated\_conjecture})$   
 $\text{ssSkC}_0 \Rightarrow \text{chevy}(\text{skc}_{11}, \text{skc}_{13})$   $\text{cnf}(\text{clause}_{23}, \text{negated\_conjecture})$   
 $\text{ssSkC}_0 \Rightarrow \text{white}(\text{skc}_{11}, \text{skc}_{13})$   $\text{cnf}(\text{clause}_{24}, \text{negated\_conjecture})$   
 $\text{ssSkC}_0 \Rightarrow \text{dirty}(\text{skc}_{11}, \text{skc}_{13})$   $\text{cnf}(\text{clause}_{25}, \text{negated\_conjecture})$   
 $\text{ssSkC}_0 \Rightarrow \text{old}(\text{skc}_{11}, \text{skc}_{13})$   $\text{cnf}(\text{clause}_{26}, \text{negated\_conjecture})$   
 $\text{ssSkC}_0$  or  $\text{down}(\text{skc}_{17}, \text{skc}_{18}, \text{skc}_{21})$   $\text{cnf}(\text{clause}_{27}, \text{negated\_conjecture})$   
 $\text{ssSkC}_0$  or  $\text{in}(\text{skc}_{17}, \text{skc}_{18}, \text{skc}_{19})$   $\text{cnf}(\text{clause}_{28}, \text{negated\_conjecture})$   
 $\text{ssSkC}_0$  or  $\text{agent}(\text{skc}_{17}, \text{skc}_{18}, \text{skc}_{19})$   $\text{cnf}(\text{clause}_{29}, \text{negated\_conjecture})$   
 $\text{ssSkC}_0$  or  $\text{of}(\text{skc}_{17}, \text{skc}_{20}, \text{skc}_{19})$   $\text{cnf}(\text{clause}_{30}, \text{negated\_conjecture})$   
 $\text{ssSkC}_0 \Rightarrow \text{down}(\text{skc}_{11}, \text{skc}_{12}, \text{skc}_{16})$   $\text{cnf}(\text{clause}_{31}, \text{negated\_conjecture})$   
 $\text{ssSkC}_0 \Rightarrow \text{in}(\text{skc}_{11}, \text{skc}_{12}, \text{skc}_{15})$   $\text{cnf}(\text{clause}_{32}, \text{negated\_conjecture})$   
 $\text{ssSkC}_0 \Rightarrow \text{of}(\text{skc}_{11}, \text{skc}_{14}, \text{skc}_{15})$   $\text{cnf}(\text{clause}_{33}, \text{negated\_conjecture})$   
 $\text{ssSkC}_0 \Rightarrow \text{agent}(\text{skc}_{11}, \text{skc}_{12}, \text{skc}_{13})$   $\text{cnf}(\text{clause}_{34}, \text{negated\_conjecture})$   
 $(\text{down}(u, v, w)$  and  $\text{lonely}(u, w)$  and  $\text{street}(u, w)$  and  $\text{barrel}(u, v)$  and  $\text{present}(u, v)$  and  $\text{event}(u, v)$  and  $\text{hollywood\_placename}(u, v)$  and  $\text{placename}(u, v)$  and  $\text{city}(u, w)$  and  $\text{chevy}(u, v)$  and  $\text{white}(u, v)$  and  $\text{dirty}(u, v)$  and  $\text{old}(u, v)$  and  $\text{down}(u, v, w)$  and  $\text{lonely}(u, w)$  and  $\text{street}(u, w)$  and  $\text{in}(u, v, x)$  and  $\text{agent}(u, v, w, x, y, z)$  and  $\text{of}(u, w, x)$ )  
 $\text{ssSkC}_0$   $\text{cnf}(\text{clause}_{35}, \text{negated\_conjecture})$   
 $(\text{event}(u, v)$  and  $\text{present}(u, v)$  and  $\text{barrel}(u, v)$  and  $\text{down}(u, v, w)$  and  $\text{lonely}(u, w)$  and  $\text{street}(u, w)$  and  $\text{in}(u, v, x)$  and  $\text{agent}(u, v, w, x, y, z)$  and  $\text{of}(u, w, x)$ )  
 $\neg \text{ssSkC}_0$   $\text{cnf}(\text{clause}_{36}, \text{negated\_conjecture})$

### NLP116+1.p An old dirty white Chevy, problem 3

Eliminating logically equivalent interpretations in the statement "An old dirty white chevy barrels down a lonely street in hollywood."

$\neg \neg (\exists u: (\text{actual\_world}(u)$  and  $\exists v, w, x, y: (\text{street}(u, v)$  and  $\text{lonely}(u, v)$  and  $\text{of}(u, w, x)$  and  $\text{city}(u, x)$  and  $\text{hollywood\_placename}(u, v)$  and  $\text{placename}(u, v)$  and  $\text{city}(u, w)$  and  $\text{chevy}(u, v)$  and  $\text{white}(u, v)$  and  $\text{dirty}(u, v)$  and  $\text{old}(u, v)$  and  $\text{down}(u, v, w)$  and  $\text{lonely}(u, w)$  and  $\text{street}(u, w)$  and  $\text{in}(u, v, x)$  and  $\text{agent}(u, v, w, x, y, z)$  and  $\text{of}(u, w, x)$ )  
 $\exists z: (\text{actual\_world}(z)$  and  $\exists x_1, x_2, x_3, x_4: (\text{of}(z, x_1, x_2)$  and  $\text{city}(z, x_2)$  and  $\text{hollywood\_placename}(z, x_1)$  and  $\text{placename}(z, x_1)$  and  $\text{city}(z, x_3)$  and  $\text{chevy}(z, x_3)$  and  $\text{white}(z, x_3)$  and  $\text{dirty}(z, x_3)$  and  $\text{old}(z, x_3)$  and  $\text{down}(z, x_3, x_4)$  and  $\text{lonely}(z, x_4)$  and  $\text{street}(z, x_4)$  and  $\text{in}(z, x_4, x_5)$  and  $\text{agent}(z, x_4, x_5, x_6, x_7, x_8)$  and  $\text{of}(z, x_4, x_6)$ )  
 $\exists u: (\text{actual\_world}(u)$  and  $\exists v, w, x, y: (\text{street}(u, v)$  and  $\text{lonely}(u, v)$  and  $\text{of}(u, w, x)$  and  $\text{city}(u, x)$  and  $\text{hollywood\_placename}(u, v)$  and  $\text{placename}(u, v)$  and  $\text{city}(u, w)$  and  $\text{chevy}(u, v)$  and  $\text{white}(u, v)$  and  $\text{dirty}(u, v)$  and  $\text{old}(u, v)$  and  $\text{down}(u, v, w)$  and  $\text{lonely}(u, w)$  and  $\text{street}(u, w)$  and  $\text{in}(u, v, x)$  and  $\text{agent}(u, v, w, x, y, z)$  and  $\text{of}(u, w, x)$ )

### NLP116-1.p An old dirty white Chevy, problem 3

Eliminating logically equivalent interpretations in the statement "An old dirty white chevy barrels down a lonely street in hollywood."

$\text{actual\_world}(\text{skc}_{15})$   $\text{cnf}(\text{clause}_1, \text{negated\_conjecture})$   
 $\text{actual\_world}(\text{skc}_{10})$   $\text{cnf}(\text{clause}_2, \text{negated\_conjecture})$   
 $\text{ssSkC}_0$  or  $\text{event}(\text{skc}_{15}, \text{skc}_{16})$   $\text{cnf}(\text{clause}_3, \text{negated\_conjecture})$   
 $\text{ssSkC}_0$  or  $\text{present}(\text{skc}_{15}, \text{skc}_{16})$   $\text{cnf}(\text{clause}_4, \text{negated\_conjecture})$   
 $\text{ssSkC}_0$  or  $\text{barrel}(\text{skc}_{15}, \text{skc}_{16})$   $\text{cnf}(\text{clause}_5, \text{negated\_conjecture})$   
 $\text{ssSkC}_0$  or  $\text{lonely}(\text{skc}_{15}, \text{skc}_{19})$   $\text{cnf}(\text{clause}_6, \text{negated\_conjecture})$   
 $\text{ssSkC}_0$  or  $\text{street}(\text{skc}_{15}, \text{skc}_{19})$   $\text{cnf}(\text{clause}_7, \text{negated\_conjecture})$   
 $\text{ssSkC}_0$  or  $\text{old}(\text{skc}_{15}, \text{skc}_{17})$   $\text{cnf}(\text{clause}_8, \text{negated\_conjecture})$   
 $\text{ssSkC}_0$  or  $\text{dirty}(\text{skc}_{15}, \text{skc}_{17})$   $\text{cnf}(\text{clause}_9, \text{negated\_conjecture})$   
 $\text{ssSkC}_0$  or  $\text{white}(\text{skc}_{15}, \text{skc}_{17})$   $\text{cnf}(\text{clause}_{10}, \text{negated\_conjecture})$   
 $\text{ssSkC}_0$  or  $\text{chevy}(\text{skc}_{15}, \text{skc}_{17})$   $\text{cnf}(\text{clause}_{11}, \text{negated\_conjecture})$   
 $\text{ssSkC}_0$  or  $\text{city}(\text{skc}_{15}, \text{skc}_{17})$   $\text{cnf}(\text{clause}_{12}, \text{negated\_conjecture})$   
 $\text{ssSkC}_0$  or  $\text{hollywood\_placename}(\text{skc}_{15}, \text{skc}_{18})$   $\text{cnf}(\text{clause}_{13}, \text{negated\_conjecture})$   
 $\text{ssSkC}_0$  or  $\text{placename}(\text{skc}_{15}, \text{skc}_{18})$   $\text{cnf}(\text{clause}_{14}, \text{negated\_conjecture})$   
 $\text{ssSkC}_0 \Rightarrow \text{city}(\text{skc}_{10}, \text{skc}_{13})$   $\text{cnf}(\text{clause}_{15}, \text{negated\_conjecture})$   
 $\text{ssSkC}_0 \Rightarrow \text{street}(\text{skc}_{10}, \text{skc}_{13})$   $\text{cnf}(\text{clause}_{16}, \text{negated\_conjecture})$   
 $\text{ssSkC}_0 \Rightarrow \text{lonely}(\text{skc}_{10}, \text{skc}_{13})$   $\text{cnf}(\text{clause}_{17}, \text{negated\_conjecture})$   
 $\text{ssSkC}_0 \Rightarrow \text{placename}(\text{skc}_{10}, \text{skc}_{14})$   $\text{cnf}(\text{clause}_{18}, \text{negated\_conjecture})$   
 $\text{ssSkC}_0 \Rightarrow \text{hollywood\_placename}(\text{skc}_{10}, \text{skc}_{14})$   $\text{cnf}(\text{clause}_{19}, \text{negated\_conjecture})$   
 $\text{ssSkC}_0 \Rightarrow \text{event}(\text{skc}_{10}, \text{skc}_{11})$   $\text{cnf}(\text{clause}_{20}, \text{negated\_conjecture})$   
 $\text{ssSkC}_0 \Rightarrow \text{present}(\text{skc}_{10}, \text{skc}_{11})$   $\text{cnf}(\text{clause}_{21}, \text{negated\_conjecture})$   
 $\text{ssSkC}_0 \Rightarrow \text{barrel}(\text{skc}_{10}, \text{skc}_{11})$   $\text{cnf}(\text{clause}_{22}, \text{negated\_conjecture})$   
 $\text{ssSkC}_0 \Rightarrow \text{old}(\text{skc}_{10}, \text{skc}_{12})$   $\text{cnf}(\text{clause}_{23}, \text{negated\_conjecture})$



$ssSkC_0 \Rightarrow \text{dirty}(skc_{10}, skc_{12}) \quad \text{cnf}(\text{clause}_{24}, \text{negated\_conjecture})$   
 $ssSkC_0 \Rightarrow \text{white}(skc_{10}, skc_{12}) \quad \text{cnf}(\text{clause}_{25}, \text{negated\_conjecture})$   
 $ssSkC_0 \Rightarrow \text{chevy}(skc_{10}, skc_{12}) \quad \text{cnf}(\text{clause}_{26}, \text{negated\_conjecture})$   
 $ssSkC_0 \text{ or } \text{down}(skc_{15}, skc_{16}, skc_{19}) \quad \text{cnf}(\text{clause}_{27}, \text{negated\_conjecture})$   
 $ssSkC_0 \text{ or } \text{in}(skc_{15}, skc_{16}, skc_{17}) \quad \text{cnf}(\text{clause}_{28}, \text{negated\_conjecture})$   
 $ssSkC_0 \text{ or } \text{agent}(skc_{15}, skc_{16}, skc_{17}) \quad \text{cnf}(\text{clause}_{29}, \text{negated\_conjecture})$   
 $ssSkC_0 \text{ or } \text{of}(skc_{15}, skc_{18}, skc_{17}) \quad \text{cnf}(\text{clause}_{30}, \text{negated\_conjecture})$   
 $ssSkC_0 \Rightarrow \text{down}(skc_{10}, skc_{11}, skc_{13}) \quad \text{cnf}(\text{clause}_{31}, \text{negated\_conjecture})$   
 $ssSkC_0 \Rightarrow \text{in}(skc_{10}, skc_{11}, skc_{13}) \quad \text{cnf}(\text{clause}_{32}, \text{negated\_conjecture})$   
 $ssSkC_0 \Rightarrow \text{of}(skc_{10}, skc_{14}, skc_{13}) \quad \text{cnf}(\text{clause}_{33}, \text{negated\_conjecture})$   
 $ssSkC_0 \Rightarrow \text{agent}(skc_{10}, skc_{11}, skc_{12}) \quad \text{cnf}(\text{clause}_{34}, \text{negated\_conjecture})$   
 $(\text{city}(u, v) \text{ and } \text{street}(u, v) \text{ and } \text{lonly}(u, v) \text{ and } \text{down}(u, w, v) \text{ and } \text{in}(u, w, v) \text{ and } \text{placename}(u, x) \text{ and } \text{hollywood\_placename}(u, w))$   
 $ssSkC_0 \quad \text{cnf}(\text{clause}_{35}, \text{negated\_conjecture})$   
 $(\text{event}(u, v) \text{ and } \text{present}(u, v) \text{ and } \text{barrel}(u, v) \text{ and } \text{down}(u, v, w) \text{ and } \text{lonly}(u, w) \text{ and } \text{street}(u, w) \text{ and } \text{in}(u, v, x) \text{ and } \text{agent}(u, w, x))$   
 $\neg ssSkC_0 \quad \text{cnf}(\text{clause}_{36}, \text{negated\_conjecture})$

#### NLP117+1.p An old dirty white Chevy, problem 4

Eliminating logically equivalent interpretations in the statement "An old dirty white chevy barrels down a lonely street in hollywood."

$\neg \neg (\exists u: (\text{actual\_world}(u) \text{ and } \exists v, w, x, y, z: (\text{of}(u, w, v) \text{ and } \text{city}(u, v) \text{ and } \text{hollywood\_placename}(u, w) \text{ and } \text{placename}(u, w) \text{ and } \text{street}(u, w) \text{ and } \text{lonly}(u, w) \text{ and } \text{down}(u, w, v) \text{ and } \text{in}(u, w, v) \text{ and } \text{agent}(u, w, x) \text{ and } \text{event}(u, v) \text{ and } \text{present}(u, v) \text{ and } \text{barrel}(u, v) \text{ and } \text{down}(u, v, w) \text{ and } \text{lonly}(u, w) \text{ and } \text{street}(u, w) \text{ and } \text{in}(u, v, x) \text{ and } \text{agent}(u, w, x))))$   
 $\exists x_1: (\text{actual\_world}(x_1) \text{ and } \exists x_2, x_3, x_4, x_5, x_6: (\text{of}(x_1, x_3, x_2) \text{ and } \text{city}(x_1, x_2) \text{ and } \text{hollywood\_placename}(x_1, x_3) \text{ and } \text{placename}(x_1, x_3) \text{ and } \text{street}(x_1, x_3) \text{ and } \text{lonly}(x_1, x_3) \text{ and } \text{down}(x_1, x_3, x_4) \text{ and } \text{in}(x_1, x_3, x_5) \text{ and } \text{agent}(x_1, x_3, x_6) \text{ and } \text{event}(x_1, x_3) \text{ and } \text{present}(x_1, x_3) \text{ and } \text{barrel}(x_1, x_3) \text{ and } \text{down}(x_1, x_3, x_4) \text{ and } \text{lonly}(x_1, x_3) \text{ and } \text{street}(x_1, x_3) \text{ and } \text{in}(x_1, x_3, x_5) \text{ and } \text{agent}(x_1, x_3, x_6))))$   
 $\exists u: (\text{actual\_world}(u) \text{ and } \exists v, w, x, y, z: (\text{of}(u, w, v) \text{ and } \text{city}(u, v) \text{ and } \text{hollywood\_placename}(u, w) \text{ and } \text{placename}(u, w) \text{ and } \text{street}(u, w) \text{ and } \text{lonly}(u, w) \text{ and } \text{down}(u, w, v) \text{ and } \text{in}(u, w, v) \text{ and } \text{agent}(u, w, x) \text{ and } \text{event}(u, v) \text{ and } \text{present}(u, v) \text{ and } \text{barrel}(u, v) \text{ and } \text{down}(u, v, w) \text{ and } \text{lonly}(u, w) \text{ and } \text{street}(u, w) \text{ and } \text{in}(u, v, x) \text{ and } \text{agent}(u, w, x))))$

#### NLP117-1.p An old dirty white Chevy, problem 4

Eliminating logically equivalent interpretations in the statement "An old dirty white chevy barrels down a lonely street in hollywood."

$\text{actual\_world}(skc_{18}) \quad \text{cnf}(\text{clause}_1, \text{negated\_conjecture})$   
 $\text{actual\_world}(skc_{12}) \quad \text{cnf}(\text{clause}_2, \text{negated\_conjecture})$   
 $ssSkC_0 \text{ or } \text{old}(skc_{18}, skc_{23}) \quad \text{cnf}(\text{clause}_3, \text{negated\_conjecture})$   
 $ssSkC_0 \text{ or } \text{dirty}(skc_{18}, skc_{23}) \quad \text{cnf}(\text{clause}_4, \text{negated\_conjecture})$   
 $ssSkC_0 \text{ or } \text{white}(skc_{18}, skc_{23}) \quad \text{cnf}(\text{clause}_5, \text{negated\_conjecture})$   
 $ssSkC_0 \text{ or } \text{chevy}(skc_{18}, skc_{23}) \quad \text{cnf}(\text{clause}_6, \text{negated\_conjecture})$   
 $ssSkC_0 \text{ or } \text{barrel}(skc_{18}, skc_{19}) \quad \text{cnf}(\text{clause}_7, \text{negated\_conjecture})$   
 $ssSkC_0 \text{ or } \text{present}(skc_{18}, skc_{19}) \quad \text{cnf}(\text{clause}_8, \text{negated\_conjecture})$   
 $ssSkC_0 \text{ or } \text{event}(skc_{18}, skc_{19}) \quad \text{cnf}(\text{clause}_9, \text{negated\_conjecture})$   
 $ssSkC_0 \text{ or } \text{hollywood\_placename}(skc_{18}, skc_{21}) \quad \text{cnf}(\text{clause}_{10}, \text{negated\_conjecture})$   
 $ssSkC_0 \text{ or } \text{placename}(skc_{18}, skc_{21}) \quad \text{cnf}(\text{clause}_{11}, \text{negated\_conjecture})$   
 $ssSkC_0 \text{ or } \text{city}(skc_{18}, skc_{22}) \quad \text{cnf}(\text{clause}_{12}, \text{negated\_conjecture})$   
 $ssSkC_0 \text{ or } \text{street}(skc_{18}, skc_{20}) \quad \text{cnf}(\text{clause}_{13}, \text{negated\_conjecture})$   
 $ssSkC_0 \text{ or } \text{lonly}(skc_{18}, skc_{20}) \quad \text{cnf}(\text{clause}_{14}, \text{negated\_conjecture})$   
 $ssSkC_0 \Rightarrow \text{lonly}(skc_{12}, skc_{17}) \quad \text{cnf}(\text{clause}_{15}, \text{negated\_conjecture})$   
 $ssSkC_0 \Rightarrow \text{street}(skc_{12}, skc_{17}) \quad \text{cnf}(\text{clause}_{16}, \text{negated\_conjecture})$   
 $ssSkC_0 \Rightarrow \text{barrel}(skc_{12}, skc_{13}) \quad \text{cnf}(\text{clause}_{17}, \text{negated\_conjecture})$   
 $ssSkC_0 \Rightarrow \text{present}(skc_{12}, skc_{13}) \quad \text{cnf}(\text{clause}_{18}, \text{negated\_conjecture})$   
 $ssSkC_0 \Rightarrow \text{event}(skc_{12}, skc_{13}) \quad \text{cnf}(\text{clause}_{19}, \text{negated\_conjecture})$   
 $ssSkC_0 \Rightarrow \text{hollywood\_placename}(skc_{12}, skc_{15}) \quad \text{cnf}(\text{clause}_{20}, \text{negated\_conjecture})$   
 $ssSkC_0 \Rightarrow \text{placename}(skc_{12}, skc_{15}) \quad \text{cnf}(\text{clause}_{21}, \text{negated\_conjecture})$   
 $ssSkC_0 \Rightarrow \text{city}(skc_{12}, skc_{16}) \quad \text{cnf}(\text{clause}_{22}, \text{negated\_conjecture})$   
 $ssSkC_0 \Rightarrow \text{chevy}(skc_{12}, skc_{14}) \quad \text{cnf}(\text{clause}_{23}, \text{negated\_conjecture})$   
 $ssSkC_0 \Rightarrow \text{white}(skc_{12}, skc_{14}) \quad \text{cnf}(\text{clause}_{24}, \text{negated\_conjecture})$   
 $ssSkC_0 \Rightarrow \text{dirty}(skc_{12}, skc_{14}) \quad \text{cnf}(\text{clause}_{25}, \text{negated\_conjecture})$   
 $ssSkC_0 \Rightarrow \text{old}(skc_{12}, skc_{14}) \quad \text{cnf}(\text{clause}_{26}, \text{negated\_conjecture})$   
 $ssSkC_0 \text{ or } \text{agent}(skc_{18}, skc_{19}, skc_{23}) \quad \text{cnf}(\text{clause}_{27}, \text{negated\_conjecture})$   
 $ssSkC_0 \text{ or } \text{in}(skc_{18}, skc_{19}, skc_{22}) \quad \text{cnf}(\text{clause}_{28}, \text{negated\_conjecture})$   
 $ssSkC_0 \text{ or } \text{of}(skc_{18}, skc_{21}, skc_{22}) \quad \text{cnf}(\text{clause}_{29}, \text{negated\_conjecture})$   
 $ssSkC_0 \text{ or } \text{down}(skc_{18}, skc_{19}, skc_{20}) \quad \text{cnf}(\text{clause}_{30}, \text{negated\_conjecture})$   
 $ssSkC_0 \Rightarrow \text{down}(skc_{12}, skc_{13}, skc_{17}) \quad \text{cnf}(\text{clause}_{31}, \text{negated\_conjecture})$   
 $ssSkC_0 \Rightarrow \text{in}(skc_{12}, skc_{13}, skc_{16}) \quad \text{cnf}(\text{clause}_{32}, \text{negated\_conjecture})$   
 $ssSkC_0 \Rightarrow \text{of}(skc_{12}, skc_{15}, skc_{16}) \quad \text{cnf}(\text{clause}_{33}, \text{negated\_conjecture})$   
 $ssSkC_0 \Rightarrow \text{agent}(skc_{12}, skc_{13}, skc_{14}) \quad \text{cnf}(\text{clause}_{34}, \text{negated\_conjecture})$



**NLP119-1.p** An old dirty white Chevy, problem 6

Eliminating logically equivalent interpretations in the statement "An old dirty white chevy barrels down a lonely street in hollywood."

actual\_world(sk<sub>c16</sub>)      cnf(clause<sub>1</sub>, negated\_conjecture)  
 actual\_world(sk<sub>c11</sub>)      cnf(clause<sub>2</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> or old(sk<sub>c16</sub>, sk<sub>c21</sub>)      cnf(clause<sub>3</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> or dirty(sk<sub>c16</sub>, sk<sub>c21</sub>)      cnf(clause<sub>4</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> or white(sk<sub>c16</sub>, sk<sub>c21</sub>)      cnf(clause<sub>5</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> or chevy(sk<sub>c16</sub>, sk<sub>c21</sub>)      cnf(clause<sub>6</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> or barrel(sk<sub>c16</sub>, sk<sub>c17</sub>)      cnf(clause<sub>7</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> or present(sk<sub>c16</sub>, sk<sub>c17</sub>)      cnf(clause<sub>8</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> or event(sk<sub>c16</sub>, sk<sub>c17</sub>)      cnf(clause<sub>9</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> or hollywood\_placename(sk<sub>c16</sub>, sk<sub>c19</sub>)      cnf(clause<sub>10</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> or placename(sk<sub>c16</sub>, sk<sub>c19</sub>)      cnf(clause<sub>11</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> or city(sk<sub>c16</sub>, sk<sub>c20</sub>)      cnf(clause<sub>12</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> or street(sk<sub>c16</sub>, sk<sub>c18</sub>)      cnf(clause<sub>13</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> or lonely(sk<sub>c16</sub>, sk<sub>c18</sub>)      cnf(clause<sub>14</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> ⇒ event(sk<sub>c11</sub>, sk<sub>c12</sub>)      cnf(clause<sub>15</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> ⇒ present(sk<sub>c11</sub>, sk<sub>c12</sub>)      cnf(clause<sub>16</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> ⇒ barrel(sk<sub>c11</sub>, sk<sub>c12</sub>)      cnf(clause<sub>17</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> ⇒ lonely(sk<sub>c11</sub>, sk<sub>c15</sub>)      cnf(clause<sub>18</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> ⇒ street(sk<sub>c11</sub>, sk<sub>c15</sub>)      cnf(clause<sub>19</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> ⇒ old(sk<sub>c11</sub>, sk<sub>c13</sub>)      cnf(clause<sub>20</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> ⇒ dirty(sk<sub>c11</sub>, sk<sub>c13</sub>)      cnf(clause<sub>21</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> ⇒ white(sk<sub>c11</sub>, sk<sub>c13</sub>)      cnf(clause<sub>22</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> ⇒ chevy(sk<sub>c11</sub>, sk<sub>c13</sub>)      cnf(clause<sub>23</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> ⇒ city(sk<sub>c11</sub>, sk<sub>c13</sub>)      cnf(clause<sub>24</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> ⇒ hollywood\_placename(sk<sub>c11</sub>, sk<sub>c14</sub>)      cnf(clause<sub>25</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> ⇒ placename(sk<sub>c11</sub>, sk<sub>c14</sub>)      cnf(clause<sub>26</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> or agent(sk<sub>c16</sub>, sk<sub>c17</sub>, sk<sub>c21</sub>)      cnf(clause<sub>27</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> or in(sk<sub>c16</sub>, sk<sub>c17</sub>, sk<sub>c20</sub>)      cnf(clause<sub>28</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> or of(sk<sub>c16</sub>, sk<sub>c19</sub>, sk<sub>c20</sub>)      cnf(clause<sub>29</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> or down(sk<sub>c16</sub>, sk<sub>c17</sub>, sk<sub>c18</sub>)      cnf(clause<sub>30</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> ⇒ down(sk<sub>c11</sub>, sk<sub>c12</sub>, sk<sub>c15</sub>)      cnf(clause<sub>31</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> ⇒ in(sk<sub>c11</sub>, sk<sub>c12</sub>, sk<sub>c13</sub>)      cnf(clause<sub>32</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> ⇒ agent(sk<sub>c11</sub>, sk<sub>c12</sub>, sk<sub>c13</sub>)      cnf(clause<sub>33</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> ⇒ of(sk<sub>c11</sub>, sk<sub>c14</sub>, sk<sub>c13</sub>)      cnf(clause<sub>34</sub>, negated\_conjecture)  
 (event(*u*, *v*) and present(*u*, *v*) and barrel(*u*, *v*) and down(*u*, *v*, *w*) and lonely(*u*, *w*) and street(*u*, *w*) and in(*u*, *v*, *x*) and agent(*u*, *v*, *w*))  
 ssSkC<sub>0</sub>      cnf(clause<sub>35</sub>, negated\_conjecture)  
 (agent(*u*, *v*, *w*) and old(*u*, *w*) and dirty(*u*, *w*) and white(*u*, *w*) and chevy(*u*, *w*) and barrel(*u*, *v*) and present(*u*, *v*) and event(*u*, *v*, *w*))  
 ¬ssSkC<sub>0</sub>      cnf(clause<sub>36</sub>, negated\_conjecture)

**NLP120+1.p** An old dirty white Chevy, problem 7

Eliminating logically equivalent interpretations in the statement "An old dirty white chevy barrels down a lonely street in hollywood."

¬¬(∃*u*: (actual\_world(*u*) and ∃*v*, *w*, *x*, *y*: (of(*u*, *v*, *w*) and city(*u*, *w*) and hollywood\_placename(*u*, *v*) and placename(*u*, *v*) and  
 ∃*z*: (actual\_world(*z*) and ∃*x*<sub>1</sub>, *x*<sub>2</sub>, *x*<sub>3</sub>, *x*<sub>4</sub>, *x*<sub>5</sub>: (of(*z*, *x*<sub>2</sub>, *x*<sub>1</sub>) and city(*z*, *x*<sub>1</sub>) and hollywood\_placename(*z*, *x*<sub>2</sub>) and placename(*z*, *x*<sub>3</sub>)) and  
 ∃*u*: (actual\_world(*u*) and ∃*v*, *w*, *x*, *y*: (of(*u*, *v*, *w*) and city(*u*, *w*) and hollywood\_placename(*u*, *v*) and placename(*u*, *v*) and chevy(*u*, *w*)))

**NLP120-1.p** An old dirty white Chevy, problem 7

Eliminating logically equivalent interpretations in the statement "An old dirty white chevy barrels down a lonely street in hollywood."

actual\_world(sk<sub>c17</sub>)      cnf(clause<sub>1</sub>, negated\_conjecture)  
 actual\_world(sk<sub>c11</sub>)      cnf(clause<sub>2</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> or city(sk<sub>c17</sub>, sk<sub>c20</sub>)      cnf(clause<sub>3</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> or chevy(sk<sub>c17</sub>, sk<sub>c20</sub>)      cnf(clause<sub>4</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> or white(sk<sub>c17</sub>, sk<sub>c20</sub>)      cnf(clause<sub>5</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> or dirty(sk<sub>c17</sub>, sk<sub>c20</sub>)      cnf(clause<sub>6</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> or old(sk<sub>c17</sub>, sk<sub>c20</sub>)      cnf(clause<sub>7</sub>, negated\_conjecture)  
 ssSkC<sub>0</sub> or placename(sk<sub>c17</sub>, sk<sub>c21</sub>)      cnf(clause<sub>8</sub>, negated\_conjecture)



$ssSkC_0 \Rightarrow event(sk_{10}, sk_{11}) \quad cnf(\text{clause}_{20}, \text{negated\_conjecture})$   
 $ssSkC_0 \Rightarrow present(sk_{10}, sk_{11}) \quad cnf(\text{clause}_{21}, \text{negated\_conjecture})$   
 $ssSkC_0 \Rightarrow barrel(sk_{10}, sk_{11}) \quad cnf(\text{clause}_{22}, \text{negated\_conjecture})$   
 $ssSkC_0 \Rightarrow old(sk_{10}, sk_{12}) \quad cnf(\text{clause}_{23}, \text{negated\_conjecture})$   
 $ssSkC_0 \Rightarrow dirty(sk_{10}, sk_{12}) \quad cnf(\text{clause}_{24}, \text{negated\_conjecture})$   
 $ssSkC_0 \Rightarrow white(sk_{10}, sk_{12}) \quad cnf(\text{clause}_{25}, \text{negated\_conjecture})$   
 $ssSkC_0 \Rightarrow chevy(sk_{10}, sk_{12}) \quad cnf(\text{clause}_{26}, \text{negated\_conjecture})$   
 $ssSkC_0 \text{ or } agent(sk_{15}, sk_{16}, sk_{18}) \quad cnf(\text{clause}_{27}, \text{negated\_conjecture})$   
 $ssSkC_0 \text{ or } in(sk_{15}, sk_{16}, sk_{18}) \quad cnf(\text{clause}_{28}, \text{negated\_conjecture})$   
 $ssSkC_0 \text{ or } of(sk_{15}, sk_{19}, sk_{18}) \quad cnf(\text{clause}_{29}, \text{negated\_conjecture})$   
 $ssSkC_0 \text{ or } down(sk_{15}, sk_{16}, sk_{17}) \quad cnf(\text{clause}_{30}, \text{negated\_conjecture})$   
 $ssSkC_0 \Rightarrow down(sk_{10}, sk_{11}, sk_{13}) \quad cnf(\text{clause}_{31}, \text{negated\_conjecture})$   
 $ssSkC_0 \Rightarrow in(sk_{10}, sk_{11}, sk_{13}) \quad cnf(\text{clause}_{32}, \text{negated\_conjecture})$   
 $ssSkC_0 \Rightarrow of(sk_{10}, sk_{14}, sk_{13}) \quad cnf(\text{clause}_{33}, \text{negated\_conjecture})$   
 $ssSkC_0 \Rightarrow agent(sk_{10}, sk_{11}, sk_{12}) \quad cnf(\text{clause}_{34}, \text{negated\_conjecture})$   
 $(city(u, v) \text{ and } street(u, v) \text{ and } lonely(u, v) \text{ and } down(u, w, v) \text{ and } in(u, w, v) \text{ and } placename(u, x) \text{ and } hollywood\_placename(u, x))$   
 $ssSkC_0 \quad cnf(\text{clause}_{35}, \text{negated\_conjecture})$   
 $(city(u, v) \text{ and } chevy(u, v) \text{ and } white(u, v) \text{ and } dirty(u, v) \text{ and } old(u, v) \text{ and } agent(u, w, v) \text{ and } in(u, w, v) \text{ and } placename(u, x))$   
 $\neg ssSkC_0 \quad cnf(\text{clause}_{36}, \text{negated\_conjecture})$

### NLP122+1.p An old dirty white Chevy, problem 9

Eliminating logically equivalent interpretations in the statement "An old dirty white chevy barrels down a lonely street in hollywood."

$\neg \neg (\exists u: (\text{actual\_world}(u) \text{ and } \exists v, w, x, y: (\text{of}(u, v, w) \text{ and } city(u, w) \text{ and } hollywood\_placename(u, v) \text{ and } placename(u, v) \text{ and } \exists z: (\text{actual\_world}(z) \text{ and } \exists x_1, x_2, x_3, x_4: (\text{street}(z, x_1) \text{ and } lonely(z, x_1) \text{ and } of(z, x_2, x_3) \text{ and } city(z, x_3) \text{ and } hollywood\_placename(u, v) \text{ and } chevy(u, v))))))$

### NLP122-1.p An old dirty white Chevy, problem 9

Eliminating logically equivalent interpretations in the statement "An old dirty white chevy barrels down a lonely street in hollywood."

$actual\_world(sk_{15}) \quad cnf(\text{clause}_1, \text{negated\_conjecture})$   
 $actual\_world(sk_{10}) \quad cnf(\text{clause}_2, \text{negated\_conjecture})$   
 $ssSkC_0 \text{ or } city(sk_{15}, sk_{18}) \quad cnf(\text{clause}_3, \text{negated\_conjecture})$   
 $ssSkC_0 \text{ or } chevy(sk_{15}, sk_{18}) \quad cnf(\text{clause}_4, \text{negated\_conjecture})$   
 $ssSkC_0 \text{ or } white(sk_{15}, sk_{18}) \quad cnf(\text{clause}_5, \text{negated\_conjecture})$   
 $ssSkC_0 \text{ or } dirty(sk_{15}, sk_{18}) \quad cnf(\text{clause}_6, \text{negated\_conjecture})$   
 $ssSkC_0 \text{ or } old(sk_{15}, sk_{18}) \quad cnf(\text{clause}_7, \text{negated\_conjecture})$   
 $ssSkC_0 \text{ or } placename(sk_{15}, sk_{19}) \quad cnf(\text{clause}_8, \text{negated\_conjecture})$   
 $ssSkC_0 \text{ or } hollywood\_placename(sk_{15}, sk_{19}) \quad cnf(\text{clause}_9, \text{negated\_conjecture})$   
 $ssSkC_0 \text{ or } event(sk_{15}, sk_{16}) \quad cnf(\text{clause}_{10}, \text{negated\_conjecture})$   
 $ssSkC_0 \text{ or } present(sk_{15}, sk_{16}) \quad cnf(\text{clause}_{11}, \text{negated\_conjecture})$   
 $ssSkC_0 \text{ or } barrel(sk_{15}, sk_{16}) \quad cnf(\text{clause}_{12}, \text{negated\_conjecture})$   
 $ssSkC_0 \text{ or } lonely(sk_{15}, sk_{17}) \quad cnf(\text{clause}_{13}, \text{negated\_conjecture})$   
 $ssSkC_0 \text{ or } street(sk_{15}, sk_{17}) \quad cnf(\text{clause}_{14}, \text{negated\_conjecture})$   
 $ssSkC_0 \Rightarrow event(sk_{10}, sk_{11}) \quad cnf(\text{clause}_{15}, \text{negated\_conjecture})$   
 $ssSkC_0 \Rightarrow present(sk_{10}, sk_{11}) \quad cnf(\text{clause}_{16}, \text{negated\_conjecture})$   
 $ssSkC_0 \Rightarrow barrel(sk_{10}, sk_{11}) \quad cnf(\text{clause}_{17}, \text{negated\_conjecture})$   
 $ssSkC_0 \Rightarrow lonely(sk_{10}, sk_{14}) \quad cnf(\text{clause}_{18}, \text{negated\_conjecture})$   
 $ssSkC_0 \Rightarrow street(sk_{10}, sk_{14}) \quad cnf(\text{clause}_{19}, \text{negated\_conjecture})$   
 $ssSkC_0 \Rightarrow old(sk_{10}, sk_{12}) \quad cnf(\text{clause}_{20}, \text{negated\_conjecture})$   
 $ssSkC_0 \Rightarrow dirty(sk_{10}, sk_{12}) \quad cnf(\text{clause}_{21}, \text{negated\_conjecture})$   
 $ssSkC_0 \Rightarrow white(sk_{10}, sk_{12}) \quad cnf(\text{clause}_{22}, \text{negated\_conjecture})$   
 $ssSkC_0 \Rightarrow chevy(sk_{10}, sk_{12}) \quad cnf(\text{clause}_{23}, \text{negated\_conjecture})$   
 $ssSkC_0 \Rightarrow city(sk_{10}, sk_{12}) \quad cnf(\text{clause}_{24}, \text{negated\_conjecture})$   
 $ssSkC_0 \Rightarrow hollywood\_placename(sk_{10}, sk_{13}) \quad cnf(\text{clause}_{25}, \text{negated\_conjecture})$   
 $ssSkC_0 \Rightarrow placename(sk_{10}, sk_{13}) \quad cnf(\text{clause}_{26}, \text{negated\_conjecture})$   
 $ssSkC_0 \text{ or } agent(sk_{15}, sk_{16}, sk_{18}) \quad cnf(\text{clause}_{27}, \text{negated\_conjecture})$   
 $ssSkC_0 \text{ or } in(sk_{15}, sk_{16}, sk_{18}) \quad cnf(\text{clause}_{28}, \text{negated\_conjecture})$   
 $ssSkC_0 \text{ or } of(sk_{15}, sk_{19}, sk_{18}) \quad cnf(\text{clause}_{29}, \text{negated\_conjecture})$   
 $ssSkC_0 \text{ or } down(sk_{15}, sk_{16}, sk_{17}) \quad cnf(\text{clause}_{30}, \text{negated\_conjecture})$



$\text{barrel}(u, v) \Rightarrow \text{event}(u, v) \quad \text{cnf}(\text{clause}_1, \text{axiom})$   
 $\text{event}(u, v) \Rightarrow \text{eventuality}(u, v) \quad \text{cnf}(\text{clause}_2, \text{axiom})$   
 $\text{eventuality}(u, v) \Rightarrow \text{thing}(u, v) \quad \text{cnf}(\text{clause}_3, \text{axiom})$   
 $\text{thing}(u, v) \Rightarrow \text{singleton}(u, v) \quad \text{cnf}(\text{clause}_4, \text{axiom})$   
 $\text{eventuality}(u, v) \Rightarrow \text{specific}(u, v) \quad \text{cnf}(\text{clause}_5, \text{axiom})$   
 $\text{eventuality}(u, v) \Rightarrow \text{nonexistent}(u, v) \quad \text{cnf}(\text{clause}_6, \text{axiom})$   
 $\text{eventuality}(u, v) \Rightarrow \text{unisex}(u, v) \quad \text{cnf}(\text{clause}_7, \text{axiom})$   
 $\text{street}(u, v) \Rightarrow \text{way}(u, v) \quad \text{cnf}(\text{clause}_8, \text{axiom})$   
 $\text{way}(u, v) \Rightarrow \text{artifact}(u, v) \quad \text{cnf}(\text{clause}_9, \text{axiom})$   
 $\text{artifact}(u, v) \Rightarrow \text{object}(u, v) \quad \text{cnf}(\text{clause}_{10}, \text{axiom})$   
 $\text{object}(u, v) \Rightarrow \text{entity}(u, v) \quad \text{cnf}(\text{clause}_{11}, \text{axiom})$   
 $\text{entity}(u, v) \Rightarrow \text{thing}(u, v) \quad \text{cnf}(\text{clause}_{12}, \text{axiom})$   
 $\text{entity}(u, v) \Rightarrow \text{specific}(u, v) \quad \text{cnf}(\text{clause}_{13}, \text{axiom})$   
 $\text{entity}(u, v) \Rightarrow \text{existent}(u, v) \quad \text{cnf}(\text{clause}_{14}, \text{axiom})$   
 $\text{object}(u, v) \Rightarrow \text{nonliving}(u, v) \quad \text{cnf}(\text{clause}_{15}, \text{axiom})$   
 $\text{object}(u, v) \Rightarrow \text{impartial}(u, v) \quad \text{cnf}(\text{clause}_{16}, \text{axiom})$   
 $\text{object}(u, v) \Rightarrow \text{unisex}(u, v) \quad \text{cnf}(\text{clause}_{17}, \text{axiom})$   
 $\text{placename}(u, v) \Rightarrow \text{relname}(u, v) \quad \text{cnf}(\text{clause}_{18}, \text{axiom})$   
 $\text{relname}(u, v) \Rightarrow \text{relation}(u, v) \quad \text{cnf}(\text{clause}_{19}, \text{axiom})$   
 $\text{relation}(u, v) \Rightarrow \text{abstraction}(u, v) \quad \text{cnf}(\text{clause}_{20}, \text{axiom})$   
 $\text{abstraction}(u, v) \Rightarrow \text{thing}(u, v) \quad \text{cnf}(\text{clause}_{21}, \text{axiom})$   
 $\text{abstraction}(u, v) \Rightarrow \text{nonhuman}(u, v) \quad \text{cnf}(\text{clause}_{22}, \text{axiom})$   
 $\text{abstraction}(u, v) \Rightarrow \text{general}(u, v) \quad \text{cnf}(\text{clause}_{23}, \text{axiom})$   
 $\text{abstraction}(u, v) \Rightarrow \text{unisex}(u, v) \quad \text{cnf}(\text{clause}_{24}, \text{axiom})$   
 $\text{hollywood\_placename}(u, v) \Rightarrow \text{placename}(u, v) \quad \text{cnf}(\text{clause}_{25}, \text{axiom})$   
 $\text{city}(u, v) \Rightarrow \text{location}(u, v) \quad \text{cnf}(\text{clause}_{26}, \text{axiom})$   
 $\text{location}(u, v) \Rightarrow \text{object}(u, v) \quad \text{cnf}(\text{clause}_{27}, \text{axiom})$   
 $\text{chevy}(u, v) \Rightarrow \text{car}(u, v) \quad \text{cnf}(\text{clause}_{28}, \text{axiom})$   
 $\text{car}(u, v) \Rightarrow \text{vehicle}(u, v) \quad \text{cnf}(\text{clause}_{29}, \text{axiom})$   
 $\text{vehicle}(u, v) \Rightarrow \text{transport}(u, v) \quad \text{cnf}(\text{clause}_{30}, \text{axiom})$   
 $\text{transport}(u, v) \Rightarrow \text{instrumentality}(u, v) \quad \text{cnf}(\text{clause}_{31}, \text{axiom})$   
 $\text{instrumentality}(u, v) \Rightarrow \text{artifact}(u, v) \quad \text{cnf}(\text{clause}_{32}, \text{axiom})$   
 $\text{general}(u, v) \Rightarrow \neg \text{specific}(u, v) \quad \text{cnf}(\text{clause}_{33}, \text{axiom})$   
 $\text{nonexistent}(u, v) \Rightarrow \neg \text{existent}(u, v) \quad \text{cnf}(\text{clause}_{34}, \text{axiom})$   
 $(\text{placename}(u, v) \text{ and } \text{of}(u, w, x) \text{ and } \text{placename}(u, w) \text{ and } \text{of}(u, v, x) \text{ and } \text{entity}(u, x)) \Rightarrow w = v \quad \text{cnf}(\text{clause}_{35}, \text{axiom})$   
 $\text{actual\_world}(\text{skc}_6) \quad \text{cnf}(\text{clause}_{36}, \text{negated\_conjecture})$   
 $\text{street}(\text{skc}_6, \text{skc}_{11}) \quad \text{cnf}(\text{clause}_{37}, \text{negated\_conjecture})$   
 $\text{city}(\text{skc}_6, \text{skc}_{10}) \quad \text{cnf}(\text{clause}_{38}, \text{negated\_conjecture})$   
 $\text{old}(\text{skc}_6, \text{skc}_8) \quad \text{cnf}(\text{clause}_{39}, \text{negated\_conjecture})$   
 $\text{dirty}(\text{skc}_6, \text{skc}_8) \quad \text{cnf}(\text{clause}_{40}, \text{negated\_conjecture})$   
 $\text{white}(\text{skc}_6, \text{skc}_8) \quad \text{cnf}(\text{clause}_{41}, \text{negated\_conjecture})$   
 $\text{chevy}(\text{skc}_6, \text{skc}_8) \quad \text{cnf}(\text{clause}_{42}, \text{negated\_conjecture})$   
 $\text{placename}(\text{skc}_6, \text{skc}_9) \quad \text{cnf}(\text{clause}_{43}, \text{negated\_conjecture})$   
 $\text{hollywood\_placename}(\text{skc}_6, \text{skc}_9) \quad \text{cnf}(\text{clause}_{44}, \text{negated\_conjecture})$   
 $\text{event}(\text{skc}_6, \text{skc}_7) \quad \text{cnf}(\text{clause}_{45}, \text{negated\_conjecture})$   
 $\text{present}(\text{skc}_6, \text{skc}_7) \quad \text{cnf}(\text{clause}_{46}, \text{negated\_conjecture})$   
 $\text{barrel}(\text{skc}_6, \text{skc}_7) \quad \text{cnf}(\text{clause}_{47}, \text{negated\_conjecture})$   
 $\text{lonely}(\text{skc}_6, \text{skc}_{11}) \quad \text{cnf}(\text{clause}_{48}, \text{negated\_conjecture})$   
 $\text{of}(\text{skc}_6, \text{skc}_9, \text{skc}_{10}) \quad \text{cnf}(\text{clause}_{49}, \text{negated\_conjecture})$   
 $\text{in}(\text{skc}_6, \text{skc}_7, \text{skc}_{10}) \quad \text{cnf}(\text{clause}_{50}, \text{negated\_conjecture})$   
 $\text{agent}(\text{skc}_6, \text{skc}_7, \text{skc}_8) \quad \text{cnf}(\text{clause}_{51}, \text{negated\_conjecture})$   
 $\text{down}(\text{skc}_6, \text{skc}_7, \text{skc}_{11}) \quad \text{cnf}(\text{clause}_{52}, \text{negated\_conjecture})$

### NLP125-1.p An old dirty white Chevy, problem 12

Eliminating inconsistent interpretations in the statement "An old dirty white chevy barrels down a lonely street in hollywood."

$\text{barrel}(u, v) \Rightarrow \text{event}(u, v) \quad \text{cnf}(\text{clause}_1, \text{axiom})$   
 $\text{event}(u, v) \Rightarrow \text{eventuality}(u, v) \quad \text{cnf}(\text{clause}_2, \text{axiom})$   
 $\text{eventuality}(u, v) \Rightarrow \text{thing}(u, v) \quad \text{cnf}(\text{clause}_3, \text{axiom})$   
 $\text{thing}(u, v) \Rightarrow \text{singleton}(u, v) \quad \text{cnf}(\text{clause}_4, \text{axiom})$

eventuality( $u, v$ )  $\Rightarrow$  specific( $u, v$ )    cnf(clause<sub>5</sub>, axiom)  
 eventuality( $u, v$ )  $\Rightarrow$  nonexistent( $u, v$ )    cnf(clause<sub>6</sub>, axiom)  
 eventuality( $u, v$ )  $\Rightarrow$  unisex( $u, v$ )    cnf(clause<sub>7</sub>, axiom)  
 street( $u, v$ )  $\Rightarrow$  way( $u, v$ )    cnf(clause<sub>8</sub>, axiom)  
 way( $u, v$ )  $\Rightarrow$  artifact( $u, v$ )    cnf(clause<sub>9</sub>, axiom)  
 artifact( $u, v$ )  $\Rightarrow$  object( $u, v$ )    cnf(clause<sub>10</sub>, axiom)  
 object( $u, v$ )  $\Rightarrow$  entity( $u, v$ )    cnf(clause<sub>11</sub>, axiom)  
 entity( $u, v$ )  $\Rightarrow$  thing( $u, v$ )    cnf(clause<sub>12</sub>, axiom)  
 entity( $u, v$ )  $\Rightarrow$  specific( $u, v$ )    cnf(clause<sub>13</sub>, axiom)  
 entity( $u, v$ )  $\Rightarrow$  existent( $u, v$ )    cnf(clause<sub>14</sub>, axiom)  
 object( $u, v$ )  $\Rightarrow$  nonliving( $u, v$ )    cnf(clause<sub>15</sub>, axiom)  
 object( $u, v$ )  $\Rightarrow$  impartial( $u, v$ )    cnf(clause<sub>16</sub>, axiom)  
 object( $u, v$ )  $\Rightarrow$  unisex( $u, v$ )    cnf(clause<sub>17</sub>, axiom)  
 placename( $u, v$ )  $\Rightarrow$  relname( $u, v$ )    cnf(clause<sub>18</sub>, axiom)  
 relname( $u, v$ )  $\Rightarrow$  relation( $u, v$ )    cnf(clause<sub>19</sub>, axiom)  
 relation( $u, v$ )  $\Rightarrow$  abstraction( $u, v$ )    cnf(clause<sub>20</sub>, axiom)  
 abstraction( $u, v$ )  $\Rightarrow$  thing( $u, v$ )    cnf(clause<sub>21</sub>, axiom)  
 abstraction( $u, v$ )  $\Rightarrow$  nonhuman( $u, v$ )    cnf(clause<sub>22</sub>, axiom)  
 abstraction( $u, v$ )  $\Rightarrow$  general( $u, v$ )    cnf(clause<sub>23</sub>, axiom)  
 abstraction( $u, v$ )  $\Rightarrow$  unisex( $u, v$ )    cnf(clause<sub>24</sub>, axiom)  
 hollywood\_placename( $u, v$ )  $\Rightarrow$  placename( $u, v$ )    cnf(clause<sub>25</sub>, axiom)  
 city( $u, v$ )  $\Rightarrow$  location( $u, v$ )    cnf(clause<sub>26</sub>, axiom)  
 location( $u, v$ )  $\Rightarrow$  object( $u, v$ )    cnf(clause<sub>27</sub>, axiom)  
 chevy( $u, v$ )  $\Rightarrow$  car( $u, v$ )    cnf(clause<sub>28</sub>, axiom)  
 car( $u, v$ )  $\Rightarrow$  vehicle( $u, v$ )    cnf(clause<sub>29</sub>, axiom)  
 vehicle( $u, v$ )  $\Rightarrow$  transport( $u, v$ )    cnf(clause<sub>30</sub>, axiom)  
 transport( $u, v$ )  $\Rightarrow$  instrumentality( $u, v$ )    cnf(clause<sub>31</sub>, axiom)  
 instrumentality( $u, v$ )  $\Rightarrow$  artifact( $u, v$ )    cnf(clause<sub>32</sub>, axiom)  
 general( $u, v$ )  $\Rightarrow$   $\neg$  specific( $u, v$ )    cnf(clause<sub>33</sub>, axiom)  
 nonexistent( $u, v$ )  $\Rightarrow$   $\neg$  existent( $u, v$ )    cnf(clause<sub>34</sub>, axiom)  
 (placename( $u, v$ ) and of( $u, w, x$ ) and placename( $u, w$ ) and of( $u, v, x$ ) and entity( $u, x$ ))  $\Rightarrow$   $w = v$     cnf(clause<sub>35</sub>, axiom)  
 actual\_world(sk<sub>5</sub>)    cnf(clause<sub>36</sub>, negated\_conjecture)  
 hollywood\_placename(sk<sub>5</sub>, sk<sub>9</sub>)    cnf(clause<sub>37</sub>, negated\_conjecture)  
 placename(sk<sub>5</sub>, sk<sub>9</sub>)    cnf(clause<sub>38</sub>, negated\_conjecture)  
 chevy(sk<sub>5</sub>, sk<sub>7</sub>)    cnf(clause<sub>39</sub>, negated\_conjecture)  
 white(sk<sub>5</sub>, sk<sub>7</sub>)    cnf(clause<sub>40</sub>, negated\_conjecture)  
 dirty(sk<sub>5</sub>, sk<sub>7</sub>)    cnf(clause<sub>41</sub>, negated\_conjecture)  
 old(sk<sub>5</sub>, sk<sub>7</sub>)    cnf(clause<sub>42</sub>, negated\_conjecture)  
 barrel(sk<sub>5</sub>, sk<sub>6</sub>)    cnf(clause<sub>43</sub>, negated\_conjecture)  
 present(sk<sub>5</sub>, sk<sub>6</sub>)    cnf(clause<sub>44</sub>, negated\_conjecture)  
 event(sk<sub>5</sub>, sk<sub>6</sub>)    cnf(clause<sub>45</sub>, negated\_conjecture)  
 lonely(sk<sub>5</sub>, sk<sub>8</sub>)    cnf(clause<sub>46</sub>, negated\_conjecture)  
 street(sk<sub>5</sub>, sk<sub>8</sub>)    cnf(clause<sub>47</sub>, negated\_conjecture)  
 city(sk<sub>5</sub>, sk<sub>8</sub>)    cnf(clause<sub>48</sub>, negated\_conjecture)  
 of(sk<sub>5</sub>, sk<sub>9</sub>, sk<sub>8</sub>)    cnf(clause<sub>49</sub>, negated\_conjecture)  
 agent(sk<sub>5</sub>, sk<sub>6</sub>, sk<sub>7</sub>)    cnf(clause<sub>50</sub>, negated\_conjecture)  
 in(sk<sub>5</sub>, sk<sub>6</sub>, sk<sub>8</sub>)    cnf(clause<sub>51</sub>, negated\_conjecture)  
 down(sk<sub>5</sub>, sk<sub>6</sub>, sk<sub>8</sub>)    cnf(clause<sub>52</sub>, negated\_conjecture)

### NLP126-1.p An old dirty white Chevy, problem 13

Eliminating inconsistent interpretations in the statement "An old dirty white chevy barrels down a lonely street in hollywood."

barrel( $u, v$ )  $\Rightarrow$  event( $u, v$ )    cnf(clause<sub>1</sub>, axiom)  
 event( $u, v$ )  $\Rightarrow$  eventuality( $u, v$ )    cnf(clause<sub>2</sub>, axiom)  
 eventuality( $u, v$ )  $\Rightarrow$  thing( $u, v$ )    cnf(clause<sub>3</sub>, axiom)  
 thing( $u, v$ )  $\Rightarrow$  singleton( $u, v$ )    cnf(clause<sub>4</sub>, axiom)  
 eventuality( $u, v$ )  $\Rightarrow$  specific( $u, v$ )    cnf(clause<sub>5</sub>, axiom)  
 eventuality( $u, v$ )  $\Rightarrow$  nonexistent( $u, v$ )    cnf(clause<sub>6</sub>, axiom)  
 eventuality( $u, v$ )  $\Rightarrow$  unisex( $u, v$ )    cnf(clause<sub>7</sub>, axiom)  
 street( $u, v$ )  $\Rightarrow$  way( $u, v$ )    cnf(clause<sub>8</sub>, axiom)



$\text{way}(u, v) \Rightarrow \text{artifact}(u, v) \quad \text{cnf}(\text{clause}_9, \text{axiom})$   
 $\text{artifact}(u, v) \Rightarrow \text{object}(u, v) \quad \text{cnf}(\text{clause}_{10}, \text{axiom})$   
 $\text{object}(u, v) \Rightarrow \text{entity}(u, v) \quad \text{cnf}(\text{clause}_{11}, \text{axiom})$   
 $\text{entity}(u, v) \Rightarrow \text{thing}(u, v) \quad \text{cnf}(\text{clause}_{12}, \text{axiom})$   
 $\text{entity}(u, v) \Rightarrow \text{specific}(u, v) \quad \text{cnf}(\text{clause}_{13}, \text{axiom})$   
 $\text{entity}(u, v) \Rightarrow \text{existent}(u, v) \quad \text{cnf}(\text{clause}_{14}, \text{axiom})$   
 $\text{object}(u, v) \Rightarrow \text{nonliving}(u, v) \quad \text{cnf}(\text{clause}_{15}, \text{axiom})$   
 $\text{object}(u, v) \Rightarrow \text{impartial}(u, v) \quad \text{cnf}(\text{clause}_{16}, \text{axiom})$   
 $\text{object}(u, v) \Rightarrow \text{unisex}(u, v) \quad \text{cnf}(\text{clause}_{17}, \text{axiom})$   
 $\text{placename}(u, v) \Rightarrow \text{relname}(u, v) \quad \text{cnf}(\text{clause}_{18}, \text{axiom})$   
 $\text{relname}(u, v) \Rightarrow \text{relation}(u, v) \quad \text{cnf}(\text{clause}_{19}, \text{axiom})$   
 $\text{relation}(u, v) \Rightarrow \text{abstraction}(u, v) \quad \text{cnf}(\text{clause}_{20}, \text{axiom})$   
 $\text{abstraction}(u, v) \Rightarrow \text{thing}(u, v) \quad \text{cnf}(\text{clause}_{21}, \text{axiom})$   
 $\text{abstraction}(u, v) \Rightarrow \text{nonhuman}(u, v) \quad \text{cnf}(\text{clause}_{22}, \text{axiom})$   
 $\text{abstraction}(u, v) \Rightarrow \text{general}(u, v) \quad \text{cnf}(\text{clause}_{23}, \text{axiom})$   
 $\text{abstraction}(u, v) \Rightarrow \text{unisex}(u, v) \quad \text{cnf}(\text{clause}_{24}, \text{axiom})$   
 $\text{hollywood\_placename}(u, v) \Rightarrow \text{placename}(u, v) \quad \text{cnf}(\text{clause}_{25}, \text{axiom})$   
 $\text{city}(u, v) \Rightarrow \text{location}(u, v) \quad \text{cnf}(\text{clause}_{26}, \text{axiom})$   
 $\text{location}(u, v) \Rightarrow \text{object}(u, v) \quad \text{cnf}(\text{clause}_{27}, \text{axiom})$   
 $\text{chevy}(u, v) \Rightarrow \text{car}(u, v) \quad \text{cnf}(\text{clause}_{28}, \text{axiom})$   
 $\text{car}(u, v) \Rightarrow \text{vehicle}(u, v) \quad \text{cnf}(\text{clause}_{29}, \text{axiom})$   
 $\text{vehicle}(u, v) \Rightarrow \text{transport}(u, v) \quad \text{cnf}(\text{clause}_{30}, \text{axiom})$   
 $\text{transport}(u, v) \Rightarrow \text{instrumentality}(u, v) \quad \text{cnf}(\text{clause}_{31}, \text{axiom})$   
 $\text{instrumentality}(u, v) \Rightarrow \text{artifact}(u, v) \quad \text{cnf}(\text{clause}_{32}, \text{axiom})$   
 $\text{general}(u, v) \Rightarrow \neg \text{specific}(u, v) \quad \text{cnf}(\text{clause}_{33}, \text{axiom})$   
 $\text{nonexistent}(u, v) \Rightarrow \neg \text{existent}(u, v) \quad \text{cnf}(\text{clause}_{34}, \text{axiom})$   
 $(\text{placename}(u, v) \text{ and } \text{of}(u, w, x) \text{ and } \text{placename}(u, w) \text{ and } \text{of}(u, v, x) \text{ and } \text{entity}(u, x)) \Rightarrow w = v \quad \text{cnf}(\text{clause}_{35}, \text{axiom})$   
 $\text{actual\_world}(\text{skc}_5) \quad \text{cnf}(\text{clause}_{36}, \text{negated\_conjecture})$   
 $\text{street}(\text{skc}_5, \text{skc}_9) \quad \text{cnf}(\text{clause}_{37}, \text{negated\_conjecture})$   
 $\text{placename}(\text{skc}_5, \text{skc}_8) \quad \text{cnf}(\text{clause}_{38}, \text{negated\_conjecture})$   
 $\text{hollywood\_placename}(\text{skc}_5, \text{skc}_8) \quad \text{cnf}(\text{clause}_{39}, \text{negated\_conjecture})$   
 $\text{city}(\text{skc}_5, \text{skc}_7) \quad \text{cnf}(\text{clause}_{40}, \text{negated\_conjecture})$   
 $\text{chevy}(\text{skc}_5, \text{skc}_7) \quad \text{cnf}(\text{clause}_{41}, \text{negated\_conjecture})$   
 $\text{white}(\text{skc}_5, \text{skc}_7) \quad \text{cnf}(\text{clause}_{42}, \text{negated\_conjecture})$   
 $\text{dirty}(\text{skc}_5, \text{skc}_7) \quad \text{cnf}(\text{clause}_{43}, \text{negated\_conjecture})$   
 $\text{old}(\text{skc}_5, \text{skc}_7) \quad \text{cnf}(\text{clause}_{44}, \text{negated\_conjecture})$   
 $\text{lonely}(\text{skc}_5, \text{skc}_9) \quad \text{cnf}(\text{clause}_{45}, \text{negated\_conjecture})$   
 $\text{barrel}(\text{skc}_5, \text{skc}_6) \quad \text{cnf}(\text{clause}_{46}, \text{negated\_conjecture})$   
 $\text{present}(\text{skc}_5, \text{skc}_6) \quad \text{cnf}(\text{clause}_{47}, \text{negated\_conjecture})$   
 $\text{event}(\text{skc}_5, \text{skc}_6) \quad \text{cnf}(\text{clause}_{48}, \text{negated\_conjecture})$   
 $\text{of}(\text{skc}_5, \text{skc}_8, \text{skc}_7) \quad \text{cnf}(\text{clause}_{49}, \text{negated\_conjecture})$   
 $\text{agent}(\text{skc}_5, \text{skc}_6, \text{skc}_7) \quad \text{cnf}(\text{clause}_{50}, \text{negated\_conjecture})$   
 $\text{in}(\text{skc}_5, \text{skc}_6, \text{skc}_7) \quad \text{cnf}(\text{clause}_{51}, \text{negated\_conjecture})$   
 $\text{down}(\text{skc}_5, \text{skc}_6, \text{skc}_9) \quad \text{cnf}(\text{clause}_{52}, \text{negated\_conjecture})$

#### NLP127-1.p An old dirty white Chevy, problem 14

Eliminating inconsistent interpretations in the statement "An old dirty white chevy barrels down a lonely street in hollywood."

$\text{barrel}(u, v) \Rightarrow \text{event}(u, v) \quad \text{cnf}(\text{clause}_1, \text{axiom})$   
 $\text{event}(u, v) \Rightarrow \text{eventuality}(u, v) \quad \text{cnf}(\text{clause}_2, \text{axiom})$   
 $\text{eventuality}(u, v) \Rightarrow \text{thing}(u, v) \quad \text{cnf}(\text{clause}_3, \text{axiom})$   
 $\text{thing}(u, v) \Rightarrow \text{singleton}(u, v) \quad \text{cnf}(\text{clause}_4, \text{axiom})$   
 $\text{eventuality}(u, v) \Rightarrow \text{specific}(u, v) \quad \text{cnf}(\text{clause}_5, \text{axiom})$   
 $\text{eventuality}(u, v) \Rightarrow \text{nonexistent}(u, v) \quad \text{cnf}(\text{clause}_6, \text{axiom})$   
 $\text{eventuality}(u, v) \Rightarrow \text{unisex}(u, v) \quad \text{cnf}(\text{clause}_7, \text{axiom})$   
 $\text{street}(u, v) \Rightarrow \text{way}(u, v) \quad \text{cnf}(\text{clause}_8, \text{axiom})$   
 $\text{way}(u, v) \Rightarrow \text{artifact}(u, v) \quad \text{cnf}(\text{clause}_9, \text{axiom})$   
 $\text{artifact}(u, v) \Rightarrow \text{object}(u, v) \quad \text{cnf}(\text{clause}_{10}, \text{axiom})$   
 $\text{object}(u, v) \Rightarrow \text{entity}(u, v) \quad \text{cnf}(\text{clause}_{11}, \text{axiom})$   
 $\text{entity}(u, v) \Rightarrow \text{thing}(u, v) \quad \text{cnf}(\text{clause}_{12}, \text{axiom})$

$\text{entity}(u, v) \Rightarrow \text{specific}(u, v) \quad \text{cnf}(\text{clause}_{13}, \text{axiom})$   
 $\text{entity}(u, v) \Rightarrow \text{existent}(u, v) \quad \text{cnf}(\text{clause}_{14}, \text{axiom})$   
 $\text{object}(u, v) \Rightarrow \text{nonliving}(u, v) \quad \text{cnf}(\text{clause}_{15}, \text{axiom})$   
 $\text{object}(u, v) \Rightarrow \text{impartial}(u, v) \quad \text{cnf}(\text{clause}_{16}, \text{axiom})$   
 $\text{object}(u, v) \Rightarrow \text{unisex}(u, v) \quad \text{cnf}(\text{clause}_{17}, \text{axiom})$   
 $\text{placename}(u, v) \Rightarrow \text{relname}(u, v) \quad \text{cnf}(\text{clause}_{18}, \text{axiom})$   
 $\text{relname}(u, v) \Rightarrow \text{relation}(u, v) \quad \text{cnf}(\text{clause}_{19}, \text{axiom})$   
 $\text{relation}(u, v) \Rightarrow \text{abstraction}(u, v) \quad \text{cnf}(\text{clause}_{20}, \text{axiom})$   
 $\text{abstraction}(u, v) \Rightarrow \text{thing}(u, v) \quad \text{cnf}(\text{clause}_{21}, \text{axiom})$   
 $\text{abstraction}(u, v) \Rightarrow \text{nonhuman}(u, v) \quad \text{cnf}(\text{clause}_{22}, \text{axiom})$   
 $\text{abstraction}(u, v) \Rightarrow \text{general}(u, v) \quad \text{cnf}(\text{clause}_{23}, \text{axiom})$   
 $\text{abstraction}(u, v) \Rightarrow \text{unisex}(u, v) \quad \text{cnf}(\text{clause}_{24}, \text{axiom})$   
 $\text{hollywood.placename}(u, v) \Rightarrow \text{placename}(u, v) \quad \text{cnf}(\text{clause}_{25}, \text{axiom})$   
 $\text{city}(u, v) \Rightarrow \text{location}(u, v) \quad \text{cnf}(\text{clause}_{26}, \text{axiom})$   
 $\text{location}(u, v) \Rightarrow \text{object}(u, v) \quad \text{cnf}(\text{clause}_{27}, \text{axiom})$   
 $\text{chevy}(u, v) \Rightarrow \text{car}(u, v) \quad \text{cnf}(\text{clause}_{28}, \text{axiom})$   
 $\text{car}(u, v) \Rightarrow \text{vehicle}(u, v) \quad \text{cnf}(\text{clause}_{29}, \text{axiom})$   
 $\text{vehicle}(u, v) \Rightarrow \text{transport}(u, v) \quad \text{cnf}(\text{clause}_{30}, \text{axiom})$   
 $\text{transport}(u, v) \Rightarrow \text{instrumentality}(u, v) \quad \text{cnf}(\text{clause}_{31}, \text{axiom})$   
 $\text{instrumentality}(u, v) \Rightarrow \text{artifact}(u, v) \quad \text{cnf}(\text{clause}_{32}, \text{axiom})$   
 $\text{general}(u, v) \Rightarrow \neg \text{specific}(u, v) \quad \text{cnf}(\text{clause}_{33}, \text{axiom})$   
 $\text{nonexistent}(u, v) \Rightarrow \neg \text{existent}(u, v) \quad \text{cnf}(\text{clause}_{34}, \text{axiom})$   
 $(\text{placename}(u, v) \text{ and } \text{of}(u, w, x) \text{ and } \text{placename}(u, w) \text{ and } \text{of}(u, v, x) \text{ and } \text{entity}(u, x)) \Rightarrow w = v \quad \text{cnf}(\text{clause}_{35}, \text{axiom})$   
 $\text{actual\_world}(\text{skc}_6) \quad \text{cnf}(\text{clause}_{36}, \text{negated\_conjecture})$   
 $\text{chevy}(\text{skc}_6, \text{skc}_{11}) \quad \text{cnf}(\text{clause}_{37}, \text{negated\_conjecture})$   
 $\text{city}(\text{skc}_6, \text{skc}_{10}) \quad \text{cnf}(\text{clause}_{38}, \text{negated\_conjecture})$   
 $\text{lonely}(\text{skc}_6, \text{skc}_8) \quad \text{cnf}(\text{clause}_{39}, \text{negated\_conjecture})$   
 $\text{street}(\text{skc}_6, \text{skc}_8) \quad \text{cnf}(\text{clause}_{40}, \text{negated\_conjecture})$   
 $\text{placename}(\text{skc}_6, \text{skc}_9) \quad \text{cnf}(\text{clause}_{41}, \text{negated\_conjecture})$   
 $\text{hollywood.placename}(\text{skc}_6, \text{skc}_9) \quad \text{cnf}(\text{clause}_{42}, \text{negated\_conjecture})$   
 $\text{event}(\text{skc}_6, \text{skc}_7) \quad \text{cnf}(\text{clause}_{43}, \text{negated\_conjecture})$   
 $\text{present}(\text{skc}_6, \text{skc}_7) \quad \text{cnf}(\text{clause}_{44}, \text{negated\_conjecture})$   
 $\text{barrel}(\text{skc}_6, \text{skc}_7) \quad \text{cnf}(\text{clause}_{45}, \text{negated\_conjecture})$   
 $\text{white}(\text{skc}_6, \text{skc}_{11}) \quad \text{cnf}(\text{clause}_{46}, \text{negated\_conjecture})$   
 $\text{dirty}(\text{skc}_6, \text{skc}_{11}) \quad \text{cnf}(\text{clause}_{47}, \text{negated\_conjecture})$   
 $\text{old}(\text{skc}_6, \text{skc}_{11}) \quad \text{cnf}(\text{clause}_{48}, \text{negated\_conjecture})$   
 $\text{of}(\text{skc}_6, \text{skc}_9, \text{skc}_{10}) \quad \text{cnf}(\text{clause}_{49}, \text{negated\_conjecture})$   
 $\text{in}(\text{skc}_6, \text{skc}_7, \text{skc}_{10}) \quad \text{cnf}(\text{clause}_{50}, \text{negated\_conjecture})$   
 $\text{down}(\text{skc}_6, \text{skc}_7, \text{skc}_8) \quad \text{cnf}(\text{clause}_{51}, \text{negated\_conjecture})$   
 $\text{agent}(\text{skc}_6, \text{skc}_7, \text{skc}_{11}) \quad \text{cnf}(\text{clause}_{52}, \text{negated\_conjecture})$

**NLP128-1.p** An old dirty white Chevy, problem 15

Eliminating inconsistent interpretations in the statement "An old dirty white chevy barrels down a lonely street in hollywood."

$\text{barrel}(u, v) \Rightarrow \text{event}(u, v) \quad \text{cnf}(\text{clause}_1, \text{axiom})$   
 $\text{event}(u, v) \Rightarrow \text{eventuality}(u, v) \quad \text{cnf}(\text{clause}_2, \text{axiom})$   
 $\text{eventuality}(u, v) \Rightarrow \text{thing}(u, v) \quad \text{cnf}(\text{clause}_3, \text{axiom})$   
 $\text{thing}(u, v) \Rightarrow \text{singleton}(u, v) \quad \text{cnf}(\text{clause}_4, \text{axiom})$   
 $\text{eventuality}(u, v) \Rightarrow \text{specific}(u, v) \quad \text{cnf}(\text{clause}_5, \text{axiom})$   
 $\text{eventuality}(u, v) \Rightarrow \text{nonexistent}(u, v) \quad \text{cnf}(\text{clause}_6, \text{axiom})$   
 $\text{eventuality}(u, v) \Rightarrow \text{unisex}(u, v) \quad \text{cnf}(\text{clause}_7, \text{axiom})$   
 $\text{street}(u, v) \Rightarrow \text{way}(u, v) \quad \text{cnf}(\text{clause}_8, \text{axiom})$   
 $\text{way}(u, v) \Rightarrow \text{artifact}(u, v) \quad \text{cnf}(\text{clause}_9, \text{axiom})$   
 $\text{artifact}(u, v) \Rightarrow \text{object}(u, v) \quad \text{cnf}(\text{clause}_{10}, \text{axiom})$   
 $\text{object}(u, v) \Rightarrow \text{entity}(u, v) \quad \text{cnf}(\text{clause}_{11}, \text{axiom})$   
 $\text{entity}(u, v) \Rightarrow \text{thing}(u, v) \quad \text{cnf}(\text{clause}_{12}, \text{axiom})$   
 $\text{entity}(u, v) \Rightarrow \text{specific}(u, v) \quad \text{cnf}(\text{clause}_{13}, \text{axiom})$   
 $\text{entity}(u, v) \Rightarrow \text{existent}(u, v) \quad \text{cnf}(\text{clause}_{14}, \text{axiom})$   
 $\text{object}(u, v) \Rightarrow \text{nonliving}(u, v) \quad \text{cnf}(\text{clause}_{15}, \text{axiom})$   
 $\text{object}(u, v) \Rightarrow \text{impartial}(u, v) \quad \text{cnf}(\text{clause}_{16}, \text{axiom})$

$\text{object}(u, v) \Rightarrow \text{unisex}(u, v) \quad \text{cnf}(\text{clause}_{17}, \text{axiom})$   
 $\text{placename}(u, v) \Rightarrow \text{rename}(u, v) \quad \text{cnf}(\text{clause}_{18}, \text{axiom})$   
 $\text{rename}(u, v) \Rightarrow \text{relation}(u, v) \quad \text{cnf}(\text{clause}_{19}, \text{axiom})$   
 $\text{relation}(u, v) \Rightarrow \text{abstraction}(u, v) \quad \text{cnf}(\text{clause}_{20}, \text{axiom})$   
 $\text{abstraction}(u, v) \Rightarrow \text{thing}(u, v) \quad \text{cnf}(\text{clause}_{21}, \text{axiom})$   
 $\text{abstraction}(u, v) \Rightarrow \text{nonhuman}(u, v) \quad \text{cnf}(\text{clause}_{22}, \text{axiom})$   
 $\text{abstraction}(u, v) \Rightarrow \text{general}(u, v) \quad \text{cnf}(\text{clause}_{23}, \text{axiom})$   
 $\text{abstraction}(u, v) \Rightarrow \text{unisex}(u, v) \quad \text{cnf}(\text{clause}_{24}, \text{axiom})$   
 $\text{hollywood.placename}(u, v) \Rightarrow \text{placename}(u, v) \quad \text{cnf}(\text{clause}_{25}, \text{axiom})$   
 $\text{city}(u, v) \Rightarrow \text{location}(u, v) \quad \text{cnf}(\text{clause}_{26}, \text{axiom})$   
 $\text{location}(u, v) \Rightarrow \text{object}(u, v) \quad \text{cnf}(\text{clause}_{27}, \text{axiom})$   
 $\text{chevy}(u, v) \Rightarrow \text{car}(u, v) \quad \text{cnf}(\text{clause}_{28}, \text{axiom})$   
 $\text{car}(u, v) \Rightarrow \text{vehicle}(u, v) \quad \text{cnf}(\text{clause}_{29}, \text{axiom})$   
 $\text{vehicle}(u, v) \Rightarrow \text{transport}(u, v) \quad \text{cnf}(\text{clause}_{30}, \text{axiom})$   
 $\text{transport}(u, v) \Rightarrow \text{instrumentality}(u, v) \quad \text{cnf}(\text{clause}_{31}, \text{axiom})$   
 $\text{instrumentality}(u, v) \Rightarrow \text{artifact}(u, v) \quad \text{cnf}(\text{clause}_{32}, \text{axiom})$   
 $\text{general}(u, v) \Rightarrow \neg \text{specific}(u, v) \quad \text{cnf}(\text{clause}_{33}, \text{axiom})$   
 $\text{nonexistent}(u, v) \Rightarrow \neg \text{existent}(u, v) \quad \text{cnf}(\text{clause}_{34}, \text{axiom})$   
 $(\text{placename}(u, v) \text{ and } \text{of}(u, w, x) \text{ and } \text{placename}(u, w) \text{ and } \text{of}(u, v, x) \text{ and } \text{entity}(u, x)) \Rightarrow w = v \quad \text{cnf}(\text{clause}_{35}, \text{axiom})$   
 $\text{actual\_world}(\text{skc}_5) \quad \text{cnf}(\text{clause}_{36}, \text{negated\_conjecture})$   
 $\text{hollywood.placename}(\text{skc}_5, \text{skc}_9) \quad \text{cnf}(\text{clause}_{37}, \text{negated\_conjecture})$   
 $\text{placename}(\text{skc}_5, \text{skc}_9) \quad \text{cnf}(\text{clause}_{38}, \text{negated\_conjecture})$   
 $\text{street}(\text{skc}_5, \text{skc}_7) \quad \text{cnf}(\text{clause}_{39}, \text{negated\_conjecture})$   
 $\text{lonely}(\text{skc}_5, \text{skc}_7) \quad \text{cnf}(\text{clause}_{40}, \text{negated\_conjecture})$   
 $\text{barrel}(\text{skc}_5, \text{skc}_6) \quad \text{cnf}(\text{clause}_{41}, \text{negated\_conjecture})$   
 $\text{present}(\text{skc}_5, \text{skc}_6) \quad \text{cnf}(\text{clause}_{42}, \text{negated\_conjecture})$   
 $\text{event}(\text{skc}_5, \text{skc}_6) \quad \text{cnf}(\text{clause}_{43}, \text{negated\_conjecture})$   
 $\text{old}(\text{skc}_5, \text{skc}_8) \quad \text{cnf}(\text{clause}_{44}, \text{negated\_conjecture})$   
 $\text{dirty}(\text{skc}_5, \text{skc}_8) \quad \text{cnf}(\text{clause}_{45}, \text{negated\_conjecture})$   
 $\text{white}(\text{skc}_5, \text{skc}_8) \quad \text{cnf}(\text{clause}_{46}, \text{negated\_conjecture})$   
 $\text{chevy}(\text{skc}_5, \text{skc}_8) \quad \text{cnf}(\text{clause}_{47}, \text{negated\_conjecture})$   
 $\text{city}(\text{skc}_5, \text{skc}_8) \quad \text{cnf}(\text{clause}_{48}, \text{negated\_conjecture})$   
 $\text{of}(\text{skc}_5, \text{skc}_9, \text{skc}_8) \quad \text{cnf}(\text{clause}_{49}, \text{negated\_conjecture})$   
 $\text{down}(\text{skc}_5, \text{skc}_6, \text{skc}_7) \quad \text{cnf}(\text{clause}_{50}, \text{negated\_conjecture})$   
 $\text{in}(\text{skc}_5, \text{skc}_6, \text{skc}_8) \quad \text{cnf}(\text{clause}_{51}, \text{negated\_conjecture})$   
 $\text{agent}(\text{skc}_5, \text{skc}_6, \text{skc}_8) \quad \text{cnf}(\text{clause}_{52}, \text{negated\_conjecture})$

### NLP129-1.p An old dirty white Chevy, problem 16

Eliminating inconsistent interpretations in the statement "An old dirty white chevy barrels down a lonely street in hollywood."

$\text{barrel}(u, v) \Rightarrow \text{event}(u, v) \quad \text{cnf}(\text{clause}_1, \text{axiom})$   
 $\text{event}(u, v) \Rightarrow \text{eventuality}(u, v) \quad \text{cnf}(\text{clause}_2, \text{axiom})$   
 $\text{eventuality}(u, v) \Rightarrow \text{thing}(u, v) \quad \text{cnf}(\text{clause}_3, \text{axiom})$   
 $\text{thing}(u, v) \Rightarrow \text{singleton}(u, v) \quad \text{cnf}(\text{clause}_4, \text{axiom})$   
 $\text{eventuality}(u, v) \Rightarrow \text{specific}(u, v) \quad \text{cnf}(\text{clause}_5, \text{axiom})$   
 $\text{eventuality}(u, v) \Rightarrow \text{nonexistent}(u, v) \quad \text{cnf}(\text{clause}_6, \text{axiom})$   
 $\text{eventuality}(u, v) \Rightarrow \text{unisex}(u, v) \quad \text{cnf}(\text{clause}_7, \text{axiom})$   
 $\text{street}(u, v) \Rightarrow \text{way}(u, v) \quad \text{cnf}(\text{clause}_8, \text{axiom})$   
 $\text{way}(u, v) \Rightarrow \text{artifact}(u, v) \quad \text{cnf}(\text{clause}_9, \text{axiom})$   
 $\text{artifact}(u, v) \Rightarrow \text{object}(u, v) \quad \text{cnf}(\text{clause}_{10}, \text{axiom})$   
 $\text{object}(u, v) \Rightarrow \text{entity}(u, v) \quad \text{cnf}(\text{clause}_{11}, \text{axiom})$   
 $\text{entity}(u, v) \Rightarrow \text{thing}(u, v) \quad \text{cnf}(\text{clause}_{12}, \text{axiom})$   
 $\text{entity}(u, v) \Rightarrow \text{specific}(u, v) \quad \text{cnf}(\text{clause}_{13}, \text{axiom})$   
 $\text{entity}(u, v) \Rightarrow \text{existent}(u, v) \quad \text{cnf}(\text{clause}_{14}, \text{axiom})$   
 $\text{object}(u, v) \Rightarrow \text{nonliving}(u, v) \quad \text{cnf}(\text{clause}_{15}, \text{axiom})$   
 $\text{object}(u, v) \Rightarrow \text{impartial}(u, v) \quad \text{cnf}(\text{clause}_{16}, \text{axiom})$   
 $\text{object}(u, v) \Rightarrow \text{unisex}(u, v) \quad \text{cnf}(\text{clause}_{17}, \text{axiom})$   
 $\text{placename}(u, v) \Rightarrow \text{rename}(u, v) \quad \text{cnf}(\text{clause}_{18}, \text{axiom})$   
 $\text{rename}(u, v) \Rightarrow \text{relation}(u, v) \quad \text{cnf}(\text{clause}_{19}, \text{axiom})$   
 $\text{relation}(u, v) \Rightarrow \text{abstraction}(u, v) \quad \text{cnf}(\text{clause}_{20}, \text{axiom})$

$\text{abstraction}(u, v) \Rightarrow \text{thing}(u, v) \quad \text{cnf}(\text{clause}_{21}, \text{axiom})$   
 $\text{abstraction}(u, v) \Rightarrow \text{nonhuman}(u, v) \quad \text{cnf}(\text{clause}_{22}, \text{axiom})$   
 $\text{abstraction}(u, v) \Rightarrow \text{general}(u, v) \quad \text{cnf}(\text{clause}_{23}, \text{axiom})$   
 $\text{abstraction}(u, v) \Rightarrow \text{unisex}(u, v) \quad \text{cnf}(\text{clause}_{24}, \text{axiom})$   
 $\text{hollywood\_placename}(u, v) \Rightarrow \text{placename}(u, v) \quad \text{cnf}(\text{clause}_{25}, \text{axiom})$   
 $\text{city}(u, v) \Rightarrow \text{location}(u, v) \quad \text{cnf}(\text{clause}_{26}, \text{axiom})$   
 $\text{location}(u, v) \Rightarrow \text{object}(u, v) \quad \text{cnf}(\text{clause}_{27}, \text{axiom})$   
 $\text{chevy}(u, v) \Rightarrow \text{car}(u, v) \quad \text{cnf}(\text{clause}_{28}, \text{axiom})$   
 $\text{car}(u, v) \Rightarrow \text{vehicle}(u, v) \quad \text{cnf}(\text{clause}_{29}, \text{axiom})$   
 $\text{vehicle}(u, v) \Rightarrow \text{transport}(u, v) \quad \text{cnf}(\text{clause}_{30}, \text{axiom})$   
 $\text{transport}(u, v) \Rightarrow \text{instrumentality}(u, v) \quad \text{cnf}(\text{clause}_{31}, \text{axiom})$   
 $\text{instrumentality}(u, v) \Rightarrow \text{artifact}(u, v) \quad \text{cnf}(\text{clause}_{32}, \text{axiom})$   
 $\text{general}(u, v) \Rightarrow \neg \text{specific}(u, v) \quad \text{cnf}(\text{clause}_{33}, \text{axiom})$   
 $\text{nonexistent}(u, v) \Rightarrow \neg \text{existent}(u, v) \quad \text{cnf}(\text{clause}_{34}, \text{axiom})$   
 $(\text{placename}(u, v) \text{ and } \text{of}(u, w, x) \text{ and } \text{placename}(u, w) \text{ and } \text{of}(u, v, x) \text{ and } \text{entity}(u, x)) \Rightarrow w = v \quad \text{cnf}(\text{clause}_{35}, \text{axiom})$   
 $\text{actual\_world}(\text{skc}_5) \quad \text{cnf}(\text{clause}_{36}, \text{negated\_conjecture})$   
 $\text{chevy}(\text{skc}_5, \text{skc}_9) \quad \text{cnf}(\text{clause}_{37}, \text{negated\_conjecture})$   
 $\text{placename}(\text{skc}_5, \text{skc}_8) \quad \text{cnf}(\text{clause}_{38}, \text{negated\_conjecture})$   
 $\text{hollywood\_placename}(\text{skc}_5, \text{skc}_8) \quad \text{cnf}(\text{clause}_{39}, \text{negated\_conjecture})$   
 $\text{city}(\text{skc}_5, \text{skc}_7) \quad \text{cnf}(\text{clause}_{40}, \text{negated\_conjecture})$   
 $\text{street}(\text{skc}_5, \text{skc}_7) \quad \text{cnf}(\text{clause}_{41}, \text{negated\_conjecture})$   
 $\text{lonely}(\text{skc}_5, \text{skc}_7) \quad \text{cnf}(\text{clause}_{42}, \text{negated\_conjecture})$   
 $\text{white}(\text{skc}_5, \text{skc}_9) \quad \text{cnf}(\text{clause}_{43}, \text{negated\_conjecture})$   
 $\text{dirty}(\text{skc}_5, \text{skc}_9) \quad \text{cnf}(\text{clause}_{44}, \text{negated\_conjecture})$   
 $\text{old}(\text{skc}_5, \text{skc}_9) \quad \text{cnf}(\text{clause}_{45}, \text{negated\_conjecture})$   
 $\text{barrel}(\text{skc}_5, \text{skc}_6) \quad \text{cnf}(\text{clause}_{46}, \text{negated\_conjecture})$   
 $\text{present}(\text{skc}_5, \text{skc}_6) \quad \text{cnf}(\text{clause}_{47}, \text{negated\_conjecture})$   
 $\text{event}(\text{skc}_5, \text{skc}_6) \quad \text{cnf}(\text{clause}_{48}, \text{negated\_conjecture})$   
 $\text{of}(\text{skc}_5, \text{skc}_8, \text{skc}_7) \quad \text{cnf}(\text{clause}_{49}, \text{negated\_conjecture})$   
 $\text{down}(\text{skc}_5, \text{skc}_6, \text{skc}_7) \quad \text{cnf}(\text{clause}_{50}, \text{negated\_conjecture})$   
 $\text{in}(\text{skc}_5, \text{skc}_6, \text{skc}_7) \quad \text{cnf}(\text{clause}_{51}, \text{negated\_conjecture})$   
 $\text{agent}(\text{skc}_5, \text{skc}_6, \text{skc}_9) \quad \text{cnf}(\text{clause}_{52}, \text{negated\_conjecture})$

**NLP560+1.p** Cytogeneticist is a hyponym of biologist

include('Axioms/NLP001+0.ax')

$\forall x, y, z: ((\text{hypernym}(x, y) \text{ and } \text{hypernym}(y, z)) \Rightarrow \text{hypernym}(x, z)) \quad \text{fof}(\text{axiom}_1, \text{axiom})$

$\forall x, y: (\text{hypernym}(x, y) \Rightarrow \text{hyponym}(y, x)) \quad \text{fof}(\text{axiom}_2, \text{axiom})$

$\forall x, y: (\text{hyponym}(x, y) \Rightarrow \text{hypernym}(y, x)) \quad \text{fof}(\text{axiom}_3, \text{axiom})$

$\text{hypernym}(n_{9986904}, n_{9855630}) \quad \text{fof}(\text{hypernym\_transitivity}_1, \text{conjecture})$

**NLP561+1.p** Cytogeneticist is a hyponym of scientist

include('Axioms/NLP001+0.ax')

$\forall x, y, z: ((\text{hypernym}(x, y) \text{ and } \text{hypernym}(y, z)) \Rightarrow \text{hypernym}(x, z)) \quad \text{fof}(\text{axiom}_1, \text{axiom})$

$\forall x, y: (\text{hypernym}(x, y) \Rightarrow \text{hyponym}(y, x)) \quad \text{fof}(\text{axiom}_2, \text{axiom})$

$\forall x, y: (\text{hyponym}(x, y) \Rightarrow \text{hypernym}(y, x)) \quad \text{fof}(\text{axiom}_3, \text{axiom})$

$\text{hypernym}(n_{9986904}, n_{10560637}) \quad \text{fof}(\text{hypernym\_transitivity}_1, \text{conjecture})$

**NLP562+1.p** Cytogeneticist is a hyponym of individual

include('Axioms/NLP001+0.ax')

$\forall x, y, z: ((\text{hypernym}(x, y) \text{ and } \text{hypernym}(y, z)) \Rightarrow \text{hypernym}(x, z)) \quad \text{fof}(\text{axiom}_1, \text{axiom})$

$\forall x, y: (\text{hypernym}(x, y) \Rightarrow \text{hyponym}(y, x)) \quad \text{fof}(\text{axiom}_2, \text{axiom})$

$\forall x, y: (\text{hyponym}(x, y) \Rightarrow \text{hypernym}(y, x)) \quad \text{fof}(\text{axiom}_3, \text{axiom})$

$\text{hypernym}(n_{9986904}, n_{7846}) \quad \text{fof}(\text{hypernym\_transitivity}_1, \text{conjecture})$

**NLP563+1.p** Satisfiability of WordNet axioms

include('Axioms/NLP001+0.ax')

**NLP564^7.p** Belief Change in man-machine-dialogues

include('Axioms/LCL015^0.ax')

include('Axioms/LCL013^5.ax')

include('Axioms/LCL015^1.ax')

dest: mu  $\rightarrow$  \$i  $\rightarrow$  \$o  $\quad$  thf(dest\_type, type)

```

class: mu → $i → $o    thf(class_type, type)
price: mu → $i → $o    thf(price_type, type)
first: mu    thf(first_type, type)
∀v: $i: (exists_in_world@first@v)    thf(existence_of_first_ax, axiom)
ninetyfive: mu    thf(ninetyfive_type, type)
∀v: $i: (exists_in_world@ninetyfive@v)    thf(existence_of_ninetyfive_ax, axiom)
paris: mu    thf(paris_type, type)
∀v: $i: (exists_in_world@paris@v)    thf(existence_of_paris_ax, axiom)
second: mu    thf(second_type, type)
∀v: $i: (exists_in_world@second@v)    thf(existence_of_second_ax, axiom)
seventy: mu    thf(seventy_type, type)
∀v: $i: (exists_in_world@seventy@v)    thf(existence_of_seventy_ax, axiom)
mvalid@(mbox_s4@(mimplies@(mand@(dest@paris)@(class@first))@(price@ninetyfive)))    thf(law_1, axiom)
mvalid@(mbox_s4@(mimplies@(mand@(dest@paris)@(class@second))@(price@seventy)))    thf(law_2, axiom)
mvalid@(mbox_s4@(mnot@(mand@(class@first)@(class@second))))    thf(law_3, axiom)
mvalid@(mbox_s4@(mnot@(mand@(price@ninetyfive)@(price@seventy))))    thf(law_4, axiom)
mvalid@(mbox_s4@(dest@paris))    thf(belief_1, axiom)
mvalid@(mbox_s4@(class@second))    thf(belief_2, axiom)
mvalid@(mbox_s4@(price@seventy))    thf(con, conjecture)

```