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CISC 481 Homework 2

Due: April 28, 2022

**Problem 1a**

The statements convert to FOL (as provided in hw2.pdf).

|  |  |  |
| --- | --- | --- |
| **#** | **Original Statement** | **FOL** |
| 1 | All dogs have a breed |  |
| 2 | A dog is a mutt only if it is not purebred |  |
| 3 | A dog is purebred if both of its parents are purebred and are the same breed | NOTE: I use w instead of u because “u”’s become hard to read instead of a nice distinctive w. Just from my experience with CISC 304 (Logic). |
| 4 | A Yellow Labrador is a purebred |  |
| 5 | Brandi was a dog |  |
| 6 | Brandi’s mother was Tabatha, |  |
| 7 | and her father was Moondog Moses |  |
| 8 | Moondog Moses was a Yellow Labrador |  |
| 9 | Tabatha was a Yellow Labrador |  |

Now we convert FOL to CNF.

|  |  |
| --- | --- |
| **#** | **CNF** |
| 1 | NOTE: I’m putting the first given base case as #1 here. The rest of FOL statements are appended below in this table. |
| 2 |  |
| 3 |  |
| 4 |  |
| 5 |  |
| 6 |  |
| 7 |  |
| 8 |  |
| 9 |  |
| 10 |  |

**Problem 1b**

Start a proof with a base of “Brandi was not a mutt” by resolution, solve using resolution only to the first two levels of the three. Explore the negated goal and its children. Number resolvents in the order they’re generated. Keep track of bindings.

Goal:

Inverted goal:

Graphical user interface, text, application

Description automatically generated

**Problem 2a**

Our initial state description

Our goal state description

**Problem 2b**

Six action schemas

Precondition:

Effect:

Precondition:

Effect:

… where “t” means tool

Precondition:

Effect:

Precondition:

Effect:

Precondition:

Effect:

Precondition:

Effect: