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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, and her father was Moondog Moses |  |
| 7 | Moondog Moses was a Yellow Labrador |  |
| 8 | Tabatha was a Yellow Labrador |  |

Now we convert FOL to CNF.

|  |  |
| --- | --- |
| **#** | **CNF** |
| 1 |  |
| 2 |  |
| 3 |  |
| 4 |  |
| 5 |  |
| 6 |  |
| 7 |  |
| 8 |  |

**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.

|  |  |  |  |
| --- | --- | --- | --- |
| **Step** | **Resolution** | **Using** | **Binding** |
| 1 |  | None |  |
| 2 |  |  |  |
| 3 |  | 3 |  |
| 4 |  |  |  |
| 5 |  |  |  |
| 6 |  |  |  |
| 7 |  |  |  |
| 8 |  |  |  |
| 9 |  |  |  |

**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: