6.825 Resolution & Paramodulation Exercises

Exercises

September 25, 2003

1 Problem 1

Formalize each group of sentences (using the given function and predicate symbols), then prove the last from the others using resolution and paramodulation.

1. \( L(x) = \) the lover of \( x \); \( D(x) = x \) drives a red car
   - Jane’s lover drives a red car
   - Fred is the only person who drives a red car
   - Therefore, Fred is Jane’s lover
2. \( T(x) = \) the teacher of \( x \); \( G(x) = x \) is a good student
   - Mrs. Abbot only teaches good students
   - John and Mary have the same teacher
   - Mrs. Abbot is Mary’s teacher
   - Therefore, John is a good student

2 Problem 2

\( M(x) = \) the manufacturer of part \( x \); \( W(x, y) = \) part \( x \) is stored in the warehouse of company \( y \); \( T(x) = \) part \( x \) is made of titanium; \( F(x) = \) part \( x \) is fragile; use a constant for “the part I need”

- Every part is either made by FooCorp or BarCorp
- All fragile parts are stored in the warehouse of their manufacturer
- BarCorp can’t manufacture titanium parts
- The part I need is fragile and made of titanium
- Therefore, the part I need is the FooCorp’s warehouse