CSE 4/563 Knowledge Representation
Professor Shapiro
Homework 11
Maximum Points: 9
Due: 11:00 AM, Wednesday, April 22, 2009

April 15, 2009

Write your answers on $8\frac{1}{2} \times 11$ in. paper, with your name at the top. Staple multiple pages once in the upper-left hand corner. Your answers are due at the beginning of lecture on the date given above. Write extremely neatly. Anything unreadable will be considered incorrect.

1. (3) Using the Fitch-style proof theory for Relevance Logic presented in lecture, prove that

$$\vdash ((A \Rightarrow C) \wedge (B \Rightarrow C)) \Rightarrow ((A \vee B) \Rightarrow C)$$

2. (3) Using the Fitch-style proof theory for Relevance Logic presented in lecture, prove that

$$(A \Rightarrow M) \wedge (F \Leftrightarrow \neg M) \wedge (L \wedge A) \vdash \neg(L \Rightarrow F)$$

3. (3) Using the Fitch-style proof theory for Relevance Logic presented in lecture, prove that

$$\forall x(A(x) \Rightarrow \forall y(P(x, y) \Rightarrow B(y))) \vdash (\exists x \exists y(A(x) \wedge P(x, y)) \Rightarrow \exists y B(y))$$