Warmup — Homework 1

August 23, 2005

Due: 11:59 pm — August 30, 2005

Submit to "Assignment 1" in the homework submission website.

1. Assume that we have four propositions A, B, C, and D. How many models are there for the following sentences?

(a) $(A \vee B) \wedge (B \wedge (D \vee C))$

(b) $A \vee C$

(c) $A \Leftrightarrow C \Leftrightarrow D$

2. Assume that we have the theory $T = \{A \vee B,\ C \wedge D, (A \wedge C) \Rightarrow (B \wedge D)\}$.

(a) Is there any model for T in which B is false?

(b) Use the model theoretic approach to show that the sentence $D \Rightarrow (A \vee B)$ is true.

(c) Verify your proof in (b) by using the inference rules to show that the sentence $D \Rightarrow (A \vee B)$ is true.