

Computational Logic

Assignment 1

Due: 1/03/2006

1. Prove that the number of opening parenthesis in a formula is equal to the number of closing parenthesis in it.

2. Prove the following theorems

Theorem 1. $\mathcal{F} \models A \Rightarrow B$ iff $\mathcal{F} \cup \{A\} \models B$

Theorem 2. F is valid iff $\neg F$ is unsatisfiable

3. Show that $F \equiv G$ is equivalent to saying that $F \Leftrightarrow G$ is a tautology

4. Prove the following theorem

Theorem 3. If G is a subformula of F , and $G \equiv H$ then $F \equiv F[G \setminus H]$

5. Prove that $\{\neg, \wedge\}$ is a necessary set of connectives

6. Show that there can be an exponential blowup in transforming a formula into CNF following the algorithm shown in the slides.