Assignment 4:
Classical Logic

15-317: Constructive Logic

Out: Thursday, September 25, 2008
Due: Thursday, October 2, 2008, before class

This week's homework is a little shorter than usual, to leave you time to prepare for the midterm on Thursday, October 2. If you hand the homework in in class on Tuesday, we will return it in recitation on Wednesday, so you can get feedback before the exam.

1 Classical and Constructive Proofs

For each proposition A:

i) Give a proof in classical logic. You may present your proof as either a natural deduction tree or as a proof term.

ii) Compute the double-negation translation A^*.

iii) Give a proof of A^* in constructive logic. You may present your proof either as a natural deduction tree, as a proof term, or in Tutch.

See the Lecture 9 and 10 notes on classical logic and the double-negation translation.

1. $P \vee \neg P$
2. $((P \supset Q) \supset P) \supset P$
3. $\neg(P \wedge Q) \supset (\neg P \vee \neg Q)$
4. $(P \supset Q) \supset (\neg P \vee Q)$
5. $(P \supset (Q \vee R)) \supset ((P \supset Q) \vee (P \supset R))$
6. $(P \supset Q) \vee (Q \supset P)$