Assignment 7
Introduction to Computational Logic, SS 2011

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Read in the lecture notes: Chapter 4

Note: It is very important to do all the examples in the lecture notes and the exercises below in the system Coq.

Exercise 7.1 Prove that the abstract characterization of disjunction agrees with Coq's predefined notion of disjunction. Find similiar proofs for negation, equality, and universal quantification.

Exercise 7.2 Realize the abstract operations for negation with an inductive definition and a lemma for the elimination operation. Do not use *False*. Do similar proofs for equivalence and universal quantification.

Exercise 7.3 Realize the abstract operations for negation with a plain definition and lemmas for the introduction and elimination operation. Do not use *False*. Do similar proofs for equivalence and universal quantification.

Exercise 7.4 Assuming abstract logical operations comes with the risk of inconsistency. Prove the inconsistency of the following assumptions for a logical operation *bad*.

Section Bad.
Variable bad : Prop −> Prop −> Prop.
Variable badI : forall X Y : Prop, X −> bad X Y.
Variable badE : forall X Y Z : Prop, bad X Y −> (X −> Y −> Z) −> Z.
Lemma inconsistent : False.
Proof. *Your proof goes here*. **Qed**.
End Bad.
Check inconsistent.