Homework 8:
Horn clauses, the lattice of models,
Craig's interpolation theorem

CS521

Due: 9 Nov 2010

1. Find a Horn theory equivalent to the following:

$$\{\, A \rightarrow B \vee C,\ D,\ \neg E,\ C \wedge A \rightarrow E \,\}$$

   (See Dougherty's lecture notes, p.28)

2. Find the greatest lower bounds of the following sets of models. We write each model as a sequence of 0s and 1s, giving

   (a) $\{\, \langle 1, 0, 1 \rangle,\ \langle 1, 1, 0 \rangle,\ \langle 1, 1, 1 \rangle,\ \langle 0, 0, 0 \rangle \,\}$

   (b) $\{\, \langle 1, 0, 1 \rangle,\ \langle 1, 1, 0 \rangle,\ \langle 1, 0, 0 \rangle,\ \langle 1, 1, 1 \rangle,\ \langle 0, 0, 0 \rangle \,\}$

3. Prove the Craig Interpolation Theorem for propositional logic (Thm. 2.8.1, on p. 28). The hints given on p. 28 may be useful.