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 \to B \lor C, \ D, \ \neg E, \ C \land A \to 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.