CS745/ECE725 Fall 2013
Homework 2

(Predicate Logic)

1. Prove or disprove the following derivations:

   - $\forall x \bullet \exists y \bullet P(x, y) \vdash \exists y \bullet \forall x \bullet P(x, y)$
   - $(\forall x \bullet P(x) \land Q(x)) \vdash ((\forall x \bullet P(x)) \land (\forall x \bullet Q(x)))$

2. Show that

   $$(\forall x \bullet P(x) \lor Q(x)) \Leftrightarrow ((\forall x \bullet P(x)) \lor (\forall x \bullet Q(x)))$$

   is not a tautology.

3. Using sequent calculus, prove that

   $$\forall x \bullet \forall y \bullet A \vdash \forall y \bullet \forall x \bullet A$$

Deliverable
Your solutions must be typed and submitted by **4:00pm on Tuesday October 8** in class.