Problem Set 2

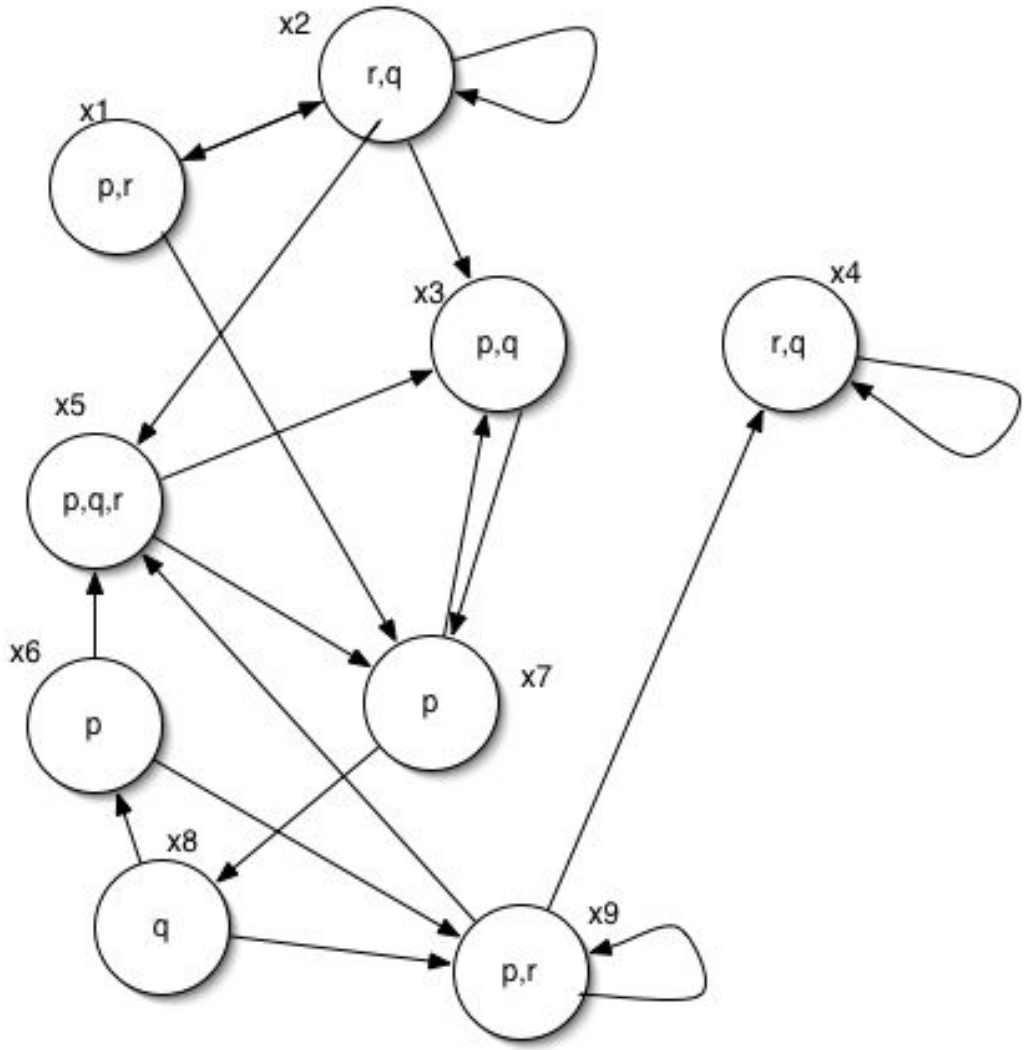
cs112

Posted: Wednesday, October 8, 2008
Due Date: Tuesday, October 28, 2008 **IN CLASS**

Exercise 1 Modal Logic

Part 1.1

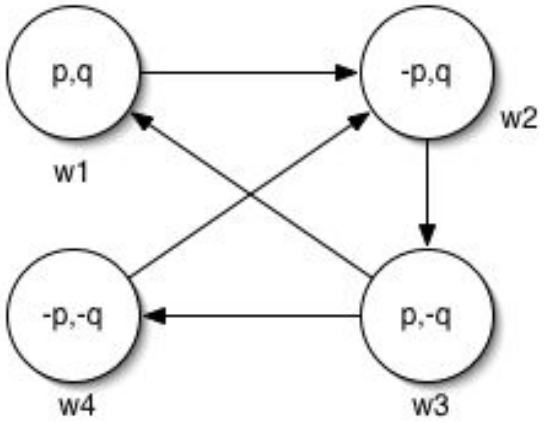
Consider the following model:



1. **Find all worlds satisfying:**
   (a) $x \Vdash \Diamond(p \wedge q)$;
   (b) $x \Vdash \Box(p \vee r)$;
2. **Does $x_1 \Vdash \Diamond\Box q$? Show why or why not.**
3. **Does $x_7 \Vdash \Box\Box\Diamond p$? Show why or why not.**
4. **Does $x_9 \Vdash \Diamond(r \vee \Diamond p)$? Show why or why not.**
5. **Decide whether the following formulas are valid in the model:**
   (a) $\Diamond p \vee \Diamond q$
   (b) $\Box(r \wedge \Diamond p)$

Part 1.2

Consider the simple model below:



Decide whether the following formulas are valid in the model:

a. $\Diamond\Box p \vee \Diamond\Diamond\Box p$

b. $\Box p \rightarrow \neg p$

c. $\Diamond(p \vee \neg p) \rightarrow \Box(p \vee \neg q)$