## Problem Set 4

## cs112

Posted: Fri, November 17, 2006 Due Date: Tues, November 28, 2006 IN CLASS

## **Propositional Dynamic Logic**

- 1. Let  $\alpha$  be the program in the class notes handout for PDL (top of page 22). Show that for any proposition  $\phi$ , the proposition  $\phi \leftrightarrow [\alpha]\phi$  is valid in the Kripke model of that example.
- 2. Sketch proofs that the following are theorems of PDL. They do not have to be complete.
  - (a)  $(\langle \alpha \rangle \phi \wedge [\alpha] \psi) \to \langle \alpha \rangle (\phi \wedge \psi)$
  - (b)  $\langle \psi ? \rangle \phi \leftrightarrow (\phi \wedge \psi)$
  - (c)  $\langle \alpha^* \rangle \phi \leftrightarrow (\phi \lor \langle \alpha \alpha^* \rangle \phi)$