

## CS 498mp: Spring 2006: Homework II

Due on Wed Mar 8

Hand over in class on Thursday or to Colin Robertson at 3229 SC

### Problem

Consider a Kripke structure  $M = (S, R, L)$ , where  $L : S \rightarrow 2^P$ , where  $P$  is a finite set of propositions.

Show that the CTL formula  $EFf \equiv lfp \tau$ , where  $\tau$  is the function  $\tau : 2^S \rightarrow 2^S$  given by:

$$\tau(W) = [[f]] \cup \{s \mid \exists s', sRs' \text{ and } s' \in W\}, \quad \text{for each } W \in 2^S$$

In other words,  $\tau(W) = f \vee EXW$ .

In  $\mu$ -calculus, the above is same as showing  $EFf$  is equivalent to  $\mu Z.(f \vee \Diamond Z)$ .