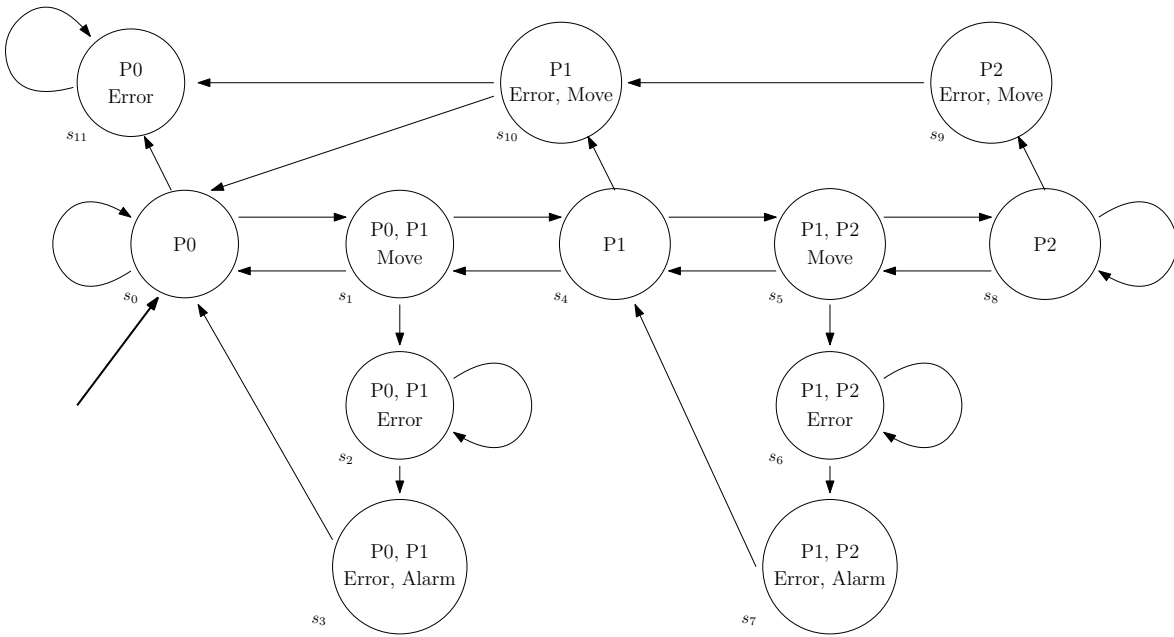


Model Checking (SS 2023) Homework 6

Deadline: **May 06, 2024, 9:00 am**
 Submit your solution through TeachCenter

Consider the following Kripke structure M that models an elevator of a two-story building, with atomic propositions $AP = \{P0, P1, P2, \text{Move}, \text{Error}, \text{Alarm}\}$ and states $S = \{s_0, \dots, s_{11}\}$.



Task 1. [33 points] Use the algorithm for explicit state model checking of CTL discussed in the lecture to decide whether K satisfies the CTL formula $f = AG(EF \text{ Error})$.

Task 2. [33 points] Use the algorithm for explicit state model checking of CTL discussed in the lecture to decide whether K satisfies the CTL formula $g = AG(\text{Alarm} \rightarrow AX(P0 \vee P1))$.

Task 3. [34 points] Use the algorithm for explicit state model checking of CTL discussed in the lecture to decide whether K satisfies the CTL formula $h = E(P0 U P1) \wedge E(P1 U P0)$.

To show the execution of the algorithm, indicate, for each subformula, the set of states that satisfy it. You can either write them down or illustrate them clearly in the Kripke structure.