Homework 2
2 pages, 50 points

Assigned   24SE01
Due   05OC01

- All work is completed individually, or in groups of two of student's choice.
- All diagrams must be drawn using Visio, or similar tool.
- Each problem is worth 12.5 points.
- Each diagram must be accompanied by a textual description. Point distribution is 70% for the diagram and 30% for the textual description.
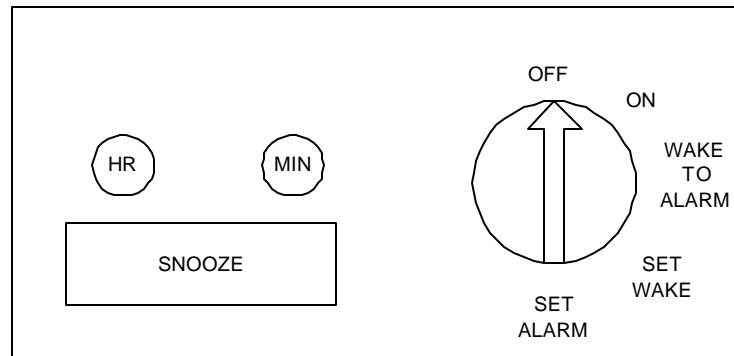
Statechart Diagrams

1. Draw a statechart diagram for a oven/4-burner stove combination with the following functionality:
   - each stove burner has a separate dial for temperature adjustment;
   - burner temperature may be changed during cooking cycle;
   - oven has a light that is on when the door is open and/or when cooking;
   - oven has a timer that can be used for either bake or broil mode;
   - oven has two dials: one for temperature and one for mode (bake, broil, or off);
   - during a cooking cycle, mode can be changed from bake to broil, or vice-versa;
   - oven light is automatically on when oven is in bake mode;
   - oven is not self-cleaning.

For behavior not explicitly described, make and describe reasonable assumptions about the system's behavior.
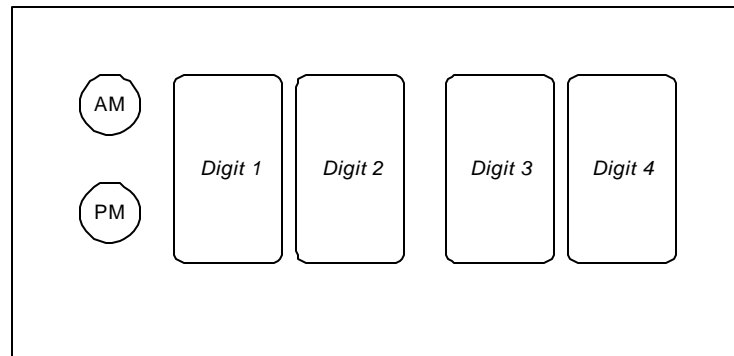
2. Draw a statechart diagram for the amusement park ride described in homework 1.

Comprehensive: Class and Statechart Diagrams

Your company specializes in design and implementation of software controls for alarm clocks. This assignment is to use UML to describe the implementation of a simple alarm clock. Although the example clock also has a radio, this homework question only involves the clock functionality. The objective is to use two diagrams to improve the quality of each other. You are asked to draw the class diagram and statechart diagram for the clock. The functionality of the clock is described in detail below. Make and state reasonable assumptions about the behavior of the clock that are not explicitly described below.

OFF
ON
WAKE
TO
ALARM
HR
MIN
SET
WAKE
SNOOZE
SET
ALARM

Top View

AM

Digit 1   Digit 2   Digit 3   Digit 4

PM

Front View

Clock/Radio Function
When the alarm goes off, pressing the snooze delays the alarm for seven minutes and then replays. At a power outage or when the clock is unplugged, both the wake time and alarm time are reset to 12 noon. Having the selector button either set to "set wake" or "set alarm" and pressing the minute button sets the minute digits (digit 3 and digit 4). The minutes cycle from 00 to 59, then back to 00. Having the selector button either set to "set wake" or "set alarm" and pressing the hour button sets the hour digits (digit 1 and digit 2). The hours cycle from 1 to 12, then back to 1. However, each time the hours cycle from 12 to 1 results in a toggle of the am/pm light. The alarm is set when the selector button is set to "wake to alarm."

3. Draw the class diagram for the clock system described above.

4. Draw the statechart diagram for the clock system described above.