These exercises are intended to help ensure you grasp the lecture material and prepare for the first project.

You should complete Part 1 before lab on Friday, because you will need it for the lab. You should bring your solutions to both Part 1 and Part 2 on paper to the lecture next Wednesday. They will not be graded, but completing the exercises will count towards your participation grade. The entire set of exercises should take you no more than six hours.

Part 1: State Machine Implementation

Draw a state machine diagram that shows the key modes for a timer that has buttons to start and stop the timer, and a button to suspend and resume.

Then describe the same machine in more detail in a textual form using operations, showing how the internal timer value is updated.

Bring this work to lab on Friday. You will implement the timer in Java during a pair-programming lab exercise. You might want to look over the three state machine patterns taught in Lecture 2, as you will be implementing the timer in each of these.

Part 2: State Machine Modelling

Draw a state machine diagram for three of the following:

(a) A telephone with a call-waiting feature.
(b) The course registration process at MIT.
(c) A DVD player with open/close, start/stop, suspend/resume.
(d) The shopping cart functionality of an online store.
(e) The power cycle of a laptop: shutdown, start, hibernate, freeze, reboot, etc.
(f) An online auction.