1. (a) Design a Moore FSM for an electronic window blinds controller. The controller has two input buttons, \textit{up\_btn} and \textit{down\_btn}, that will raise and lower the blinds, respectively. In addition, the controller has two position input signals, \textit{upper} and \textit{lower}, that indicate when the blinds have reached the highest and lowest possible position. The controller will raise the blinds by asserting a motor control output \textit{mtr\_up} when \textit{up\_btn} is pressed until the \textit{upper} position is reached, and will lower the blinds by asserting a motor control output \textit{mtr\_down} when \textit{down\_btn} is pressed until the \textit{lower} position is reached. Note that this is an incomplete specification and you may need to further specify the behavior for additional scenarios.

(b) Verify the correctness of the FSM to ensure each state is modeled correctly.

(c) Convert the Moore FSM to a Mealy implementation and describe any difference in behavior between the Moore and Mealy implementations.

2. Using any of the state-based modeling techniques discussed in lecture (including FSM, high-level state machines, hierarchical and concurrent state machines, and StateCharts) design an automated movie ticket box office. The automated box office should at a minimum accept $1, $5, and $20 bills, allow customers to purchase multiple movie tickets for a selected show, return change, and keep track of the number of tickets available for each movie. You do not need to need to implement the programming of movies, prices, and ticket availability, but you should show its interface at a high-level. \textit{Note that this homework problem is open ended and there is no single correct solution. The assignment will be graded on the completeness and correctness of your solution.}