1. (a) Design a Moore FSM for an electronic window blinds controller. The controller has two input buttons, `up_btn` and `down_btn`, that will raise and lower the blinds, respectively. In addition, the controller has two position input signals, `upper` and `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 `mtr_up` when `up_btn` is pressed until the `upper` position is reached, and will lower the blinds by asserting a motor control output `mtr_down` when `down_btn` is pressed until the `lower` position is reached. Note that this is an incomplete specification and you may need to further specify the behavior for additional scenarios.

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

2. Using StateCharts, design a robust controller for a soda machine that utilizes an interactive graphic display to provide the following functionality:

- Accepts nickels, dimes, quarters, and dollars and displays the current amount deposited.
- Provides change when needed in nickel, dimes, and quarters. Tracks the amount of nickels, quarters, and dimes available for providing change and displays “Exact Change Required” if not enough coins are available to provide change.
- Monitors soda availability and provides a restocking interface that allows a stock manager to view and update soda stock levels.

For the interactive graphic display, you should identify the operational modes the display will need to support the specified functionality, providing a brief description of each display mode. All user inputs will come from “soft” buttons from interactive graphic display. As such, you must define what buttons are needed within the various display modes.

*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.*