**CS152A Final Lab Proposal**

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**Overview**

For our project, we will create a vending machine that will dispense an item based on the amount deposited on the FPGA board. The price for an item will be displayed on the seven-segment display. The vending machine will accept nickels, dimes, and quarters through button presses. The amount deposited into the vending machine will be shown on the display and if a user deposits more money than the cost of an item, the vending machine will return change and dispense the item.

**Functionality**

The vending machine will start off displaying the price of an item. The user may also use a switch (INFO) to switch between showing the price of an item and the quantity available for that item. Once a button press associated with a denomination is detected, the vending machine will switch its display to show how much money has been inserted so far. The user will press a button in order to confirm their purchase. There will also be a switch (ADMIN) used for switching between a user and admin and a switch (INFO) used to determine what mode you are in during ADMIN.

* When ADMIN is low, the vending machine behaves normally and we treat the user as a normal person wanting to buy an item from the vending machine. When ADMIN is high, the vending machine is put into an administrative mode and will return information about the vending machine depending on the input SEL.
* INFO is a select switch that will choose between what information to display

|  |  |  |
| --- | --- | --- |
| **ADMIN** | **INFO** | **Selected** |
| 0 | 0 | Price of item |
| 0 | 1 | Quantity of item |
| 1 | 0 | Revenue made |
| 1 | 1 | Update stock of item |

* RESET button that will cancel a transaction and return change back to user if in user mode, otherwise resets the information being shown in admin mode to 0.
* When ADMIN and INFO are both high, the normal buttons used for inputting nickels, dimes, and quarters can be used to increase the stock by 5, 10, 25, respectively. The display will also blink.
* If there is change to be given out, the display will show the letter ‘C’ and the amount of change to be given out in terms of nickels, dimes, and quarters.

**Grading Rubric**

Buy Functionality (25%): A user is able to add a nickel, a dime, or a quarter to purchase an item. As a result, the seven segment display will show how much money has been deposited so far. When the user has put enough money, the seven segment display will show the letter ‘D’ to indicate that the item has been dispensed and will go back to its initial state.

Change Functionality (20%): If a user adds more money than the cost of an item, the seven segment display will show how much money is to be given back to the user. For example, if one nickel and one dime will be returned, the display will show “C110”.

Price/Quantity Functionality (25%): When the INFO switch is low and ADMIN is low, the price is shown on the display. Because decimal points cannot be represented on a seven segment display, “125” will imply a cost of $1.25, while “25” will imply a cost of $0.25. When the INFO switch is high and ADMIN is low, the quantity available for the item is shown. If a user tries to buy the item that is out of stock, the display will show “OOS” and prevent the user from being able to input coins.

Revenue Made/Update Stock Functionality (25%): When the INFO switch is low and ADMIN is high, the revenue is shown on the display. This will only be able to have a max value of $99.99. When INFO switch is high and ADMIN is high, the quantity of the item will be shown on the display while blinking. The user will be able to press buttons to increase the quantity by the aforementioned amounts.

Reset Functionality (5%): Switch will reset a transaction or information back to 0.