Hw1 Final Report

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The System

The system performs everything the project description asked. The program runs using Hw1.asm and the code is found at the top .EQU secret=0b00011011 (UDLR). The LED must be on port b pin 3 in order for the LED to turn on. As the user enters in the secret code the code will determine if the user input matches the code saved at the top. After each button press the code determines which state it's in shifts the saved code properly and compares the input to the code saved. If at any point the user doesn't enter the right code the code will reset the state to 1, sound a buzzer, and wait for the user to enter more input. As the user enters in their input the code will display which button was pressed, which button should have been pressed, which state it was in before the press, the state it's in after the press, and whether the press is correct or incorrect. If the user hits the right code the led will light up and will stay on till the user either hits the center button or tries to enter in another button press. The BAUD rate should be 4800 and 2 stop bits.

Function description

- Main: Checks if the counter does not equal 5 it checks if the user has pressed a new button if it does it has to wait till the user presses center
- Check: checks which button the user pressed
- Up_pressed: prints U to the UART loads 0b00000000 to the pressed register then checks which state to go to
- Down_pressed: prints D to the UART loads 0b00000001 to the pressed register then checks which state to go to
- Left_pressed: prints L to the UART loads 0b00000010 to the pressed register then checks which state to go to
- Right_pressed: prints R to the UART loads 0b00000011 to the pressed register then checks which state to go to
- Go_to_state: checks where the counter is and then goes to that state
- State_1: shifts the code left 6 times then checks if the code entered is the same as the shifted code if it is the code will up the counter by one otherwise it will set the counter to 1 and sound the buzzer
- State_2: shifts the code left 4 times ands it with 0b00000011 then checks if that matches the input code if it is the code will up the counter by one otherwise it will set the counter to 1 and sound the buzzer
- State_3: shifts the code left 2 times ands it with 0b00000011 then checks if that matches the input code if it is the code will up the counter by one otherwise it will set the counter to 1 and sound the buzzer
- State_4: ands code with 0b00000011 then checks if that matches the input code if it is the code will up the counter by one otherwise it will set the counter to 1 and sound the buzzer
- Counterup: increases the counter by 1
- Next: prints to the uart the next state
- Buzzer: sounds the buzzer if the user enters in the wrong code

- One: prints 1 to the UART
- Two: prints 2 to the UART
- Three: prints 3 to the UART
- Four: prints 4 to the UART
- Up: prints U to the UART
- Down: prints D to the UART
- Left: prints L to the UART
- Right: prints R to the UART
- Correct: prints C to the UART
- Incorrect: prints I to the UART
- Center: prints CLEAR to the Uart

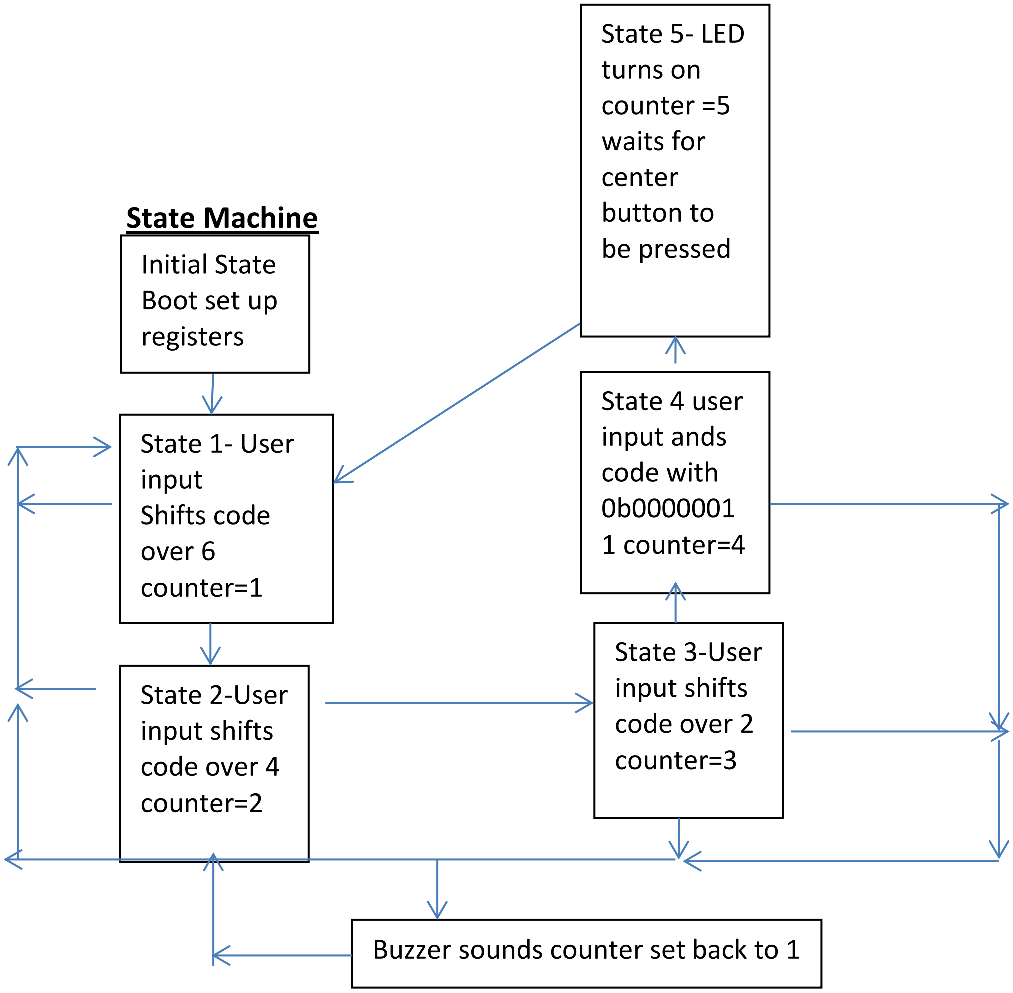
<u>Design Decisions</u>

- UP=00
- Down=01
- Left=10
- Right=11
- Center button resets the code
- No push button
- Default code is 0b00011011
- UART printout (Button Pressed, Button Desired, Current State, New State, Correct/incorrect)

<u>User Manual</u>

The code, HW1.asm, works properly the user has to enter in the right four button combination for the LED to turn on. If the code is UDLR and the user hits UDU the buzzer will sound and the code will reset the counter I.E the state and the user must reenter Up and Down to be able to find the last two presses.

State Machine


State 5- LED turns on counter =5 waits for center button to be pressed
Initial State Boot set up registers
State 1- User input Shifts code over 6 counter=1
State 4 user input ands code with 0b0000001
1 counter=4
State 2-User input shifts code over 4 counter=2
State 3-User input shifts code over 2 counter=3
Buzzer sounds counter set back to 1

Overall Status

As far as I can tell I have completed everything this project has asked for

Conclusion

To run the code use HW1.asm and the code can be found at the top set to .EQU secret=0b00011011 (UDLR). If you correctly enter the code in order to retry to enter a new code you must press the center button.