ECE 376 - Homework #5

Stepper Motors, NeoPixels, Analog Inputs. Due Monday, October 6th

Stepper Motors & Analog Inputs

Design an embedded system which uses the A/D input and the stepper motor. Some suggestions are...

- Roulette Wheel: Bet on a winning number using the analog input (0..7). Press RB0. The stepper motor then spins two rotations at 10ms / step and then stops at the winning number (N*25 steps)
- Count-Down Timer: Input how many seconds you want to wait (00 to 99) using the analog input. The stepper motor then turns at a rate of 10ms / step and stops when time is up.
- Stepper Motor Position Control: Input a number with the analog input (000 to 999) then hit RB0. The stepper motor then turns to that angle (in steps) at a rate of 10ms / step.
- Other...

1) Requirements: Specify the inputs / outputs / how they relate.
2) C code, flow chart, and resulting number of lines of assembler
3) Validation: Collect data in lab to verify you met the requirements.
4) Demo. Video or in person.

NeoPixels & Analog Inputs

Design an embedded system which uses the A/D input and a NeoPixel. Some suggestions are...

- Alarm Clock: Input a number from 00.0 to 99.0 seconds using the analog input. When you press RB0, the time decrements to 00.0 every 100ms. Set the color of the NeoPixel according to how much time is left.
- Alarm Clock (take 2): Input a number from 00.0 to 99.0 seconds using the analog input. When you press RB0, the time decrements to 00.0 every 100ms. Turn on N NeoPixels according to how much time is left/
- Roulette Wheel: Bet on a winning number with the A/D input (0..7). Press RB0. The lights on the NeoPixel then spins and stop at the winning number (0..7). If you win, your bank increases by $8. If you lose, it decreases by $1.
- Combination Lock: Input the correct password (0000 to 9999) using the analog input and press RB0. If input correctly, the NeoPixel flashes on for one second then off.
- Other...

5) Requirements: Specify the inputs / outputs / how they relate.
6) C code, flow chart, and resulting number of lines of assembler
7) Validation: Collect data in lab to verify you met the requirements.
8) Demo. Video or in person.