

# ECE 376 - Homework #5

Stepper Motors & NeoPixels in C - Due Monday, February 24th

## Stepper Motor

Design an embedded system which uses the keypad and a stepper motor. Some suggestions are...

- Valve Position: Input a number from 000 to 200. The stepper motor then goes to that angle and stops.
- Egg Timer: Input a number from 000 to 200 (0 to 20.0 seconds). The stepper motor then moves that many steps then starts stepping back to 000, one step per 100ms.
- Combination Lock: Input a 4-digit number (0000 to 9999). If the number is correct, a door opens (the stepper motor moves to 180 degrees, waits 2 seconds, then goes back to 0 degrees)
- Other

- 1) Give the requirements and flow chart for your program
- 2) C code 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.

## NeoPixel

Design an embedded system which uses the keypad and the NeoPixel. Some suggestions are...

- LED Flashlight: Input a number 0..255 on the keypad. Drive the NeoPixel at that brightness level (0..255) as white light (RGB all the same).
- LED Color Flashlight: Input a number 0..255 on the keypad. Set the brightness of RGB by pressing RB2 (R), RB1 (G), or RB2 (B).
- Starter Tree: Input a number on the keypad ( $N=0..100$ ). When \* is pressed, each light on the NeoPixel turns on one at a time with a delay of  $N*100\text{ms}$  per light.
- 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.