

ECE 476/676 - Homework #9

Acceleration & NeoPixels - Due Monday, April 7th

Program, test, and demonstrate an embedded system which uses

- A GY-521 accelerometer,
- A NeoPixel (on your Pico board or external 8x1 strip), and
- The LCD display on your Pico board

Some suggestions are:

- How High Can You Jump? Press button GP15 to start recording your acceleration for two seconds. After pressing GP15, the NeoPixel blinks three times. At that point, jump as high as you can. The Pico then measures the acceleration for two seconds, computes how long you were in the air (acceleration is zero) and displays how high you jumped.
- Magic 8-Ball. Press GP15 to start. Ask your Pico a life-changing question. Shake the accelerometer three times then flip it over to see your answer. The magic 8-ball then reveals the answer on the LCD display.
- Pillow vs. Carpet vs. Tile. Determine the maximum acceleration experienced when you drop your accelerometer on a pillow / carpeted floor / tile floor. Press GP15 to start collecting data. The NeoPixel then blinks three times and then it starts collecting acceleration data for two seconds. During those two seconds, drop the accelerometer onto the pillow / carpet / tile. The resulting maximum acceleration experienced is then displayed on the LCD display.
- Other

1) (40 points): Use of the GY521 accelerometer

- Specify what your program is going to do
- Give the resulting Python program
- Validate your program works (collect data)
- Give the results

2) (10 points) Use of a NeoPixel

- Use a NeoPixel within your program

3) (10 points): Demo your program