ECE 476/676 - Homework #10

GPS & NeoPixels - Due Monday, November 17th

Simulated Gas Leak Game

Design an embedded sytem which uses the GPS sensor in your lab kit along with a NeoPixel to simulate locating a gas leak

- On startup, the GPS sensor is used to determing your current position
- Once your position is known, press GP15 to start the game.
- When GP15 is pressed,
  - You record your current GPS position (home position)
  - You also generate two random numbers (x, y) in the range of (-100, +100) are generated.
  - This is the location of a simulated gas leak relative to your home position
- The distance to the gas leak in meters is displayed on the LCD (just distance, not direction)
- The color of the NeoPixel changes based upon distance
- Beep once you're within 1m of the gas leak

Distance	> 100m	75m	50m	25m	5m	<1m
Color	blue	cyan	green	yellow	orange	red

Grading:

- (10 pt) Able to read the GPS sensor to get your position
  - If you can't get the GPS sensor to work, use the analog input
  - Pushing the joystick moves you left/right, up/down
- (10 pt) Generate a random spot for the gas leak on pressing GP15
- (10pt) Interrupts used to detect GP15 press
- (10 pt) Display your positon in real time on the LCD display
  - Cross-hairs indicate zero position
- (10pt) Display the distance to the target on the LCD in real time as you move
- (10pt) Set the color of the NeoPixel based upon distance
- (10pt) Beep once you're within 1m of the gas leak
- (20pt) Demo