Mech103 - Lab 08

Table of Contents

Created by: Erick Valentin Created on: 3/26/21 Last Modified: 4/4/21 Description: This script performes the calculations required to complete the excercises labeled in the Lab08 outline.

Introduction

Last Modified: 3/28/21

```
clc;
clear;

weight = 5.2; % in pounds.
threshold = 5.0; % in pounds.
%weight > threshold

lower_threshold = 4.0; % in pounds.
upper_threshold = 6.0; % in pounds.
%(weight > lower_threshold) & (weight < upper_threshold)

if weight > threshold
    disp("Weight is above threshold!")
end
```

```
Weight is above threshold!
```

Use the Froce

Last Modified: 4/4/21

```
clc;
clear;

FSR_Pin = 'A0'; % Pin FSR is connected to.
VCC = 5; % Measured voltage of Arduino 5V line.
R_DIV = 330; % Measured resistance of the resistor. Check size.

forceArduino = arduino; % connect arduino.
waitTime = 2; %wait time between readings.

while(1)
     fsrVoltage = readVoltage(forceArduino,FSR_Pin); % Voltage from
 FSR.
```

```
    if fsrVoltage ~= 0
        fsrResistance = ((330*5)/fsrVoltage)-330; % Compute Rfsr.
        G = 1/fsrResistance; % Conductance.
        fprintf("Resistance is ", fsrResistance); % Print out
 Resistance.
        if fsrResistance <= 600
            force = (G-7.5E-4)/(3.2639E-7);
        else
            force = G/6.42857E-7;
        end
         fprintf("The force is ",force); % Print Force.
         pause(waitTime);
    else
        fprintf("No resistance detected"); % No resistance message.
        pause(waitTime);
    end
end
```

Error using Valentin_Lab08 (line 35)
Cannot detect Arduino hardware. Make sure Arduino hardware is properly plugged in.

More Blinky Lights.

Last Modified: 4/4/21

```
clc;
clear;

FSR_PIN = 'A0'; % FSR Pin.
VCC = 5; % Arduino Voltage.
R_DIV = 330;

forceArduino = arduino;
waitTime = 2;


while (1)

    fsrVoltage = readVoltage(forceArduino,FSR_PIN); % Voltage from FSR

    if fsrVoltage ~= 0

        fsrResistance = ((330*5)/(fsrVoltage))-330; % Compute Rfsr.
        G = 1/fsrResistance; % Conductance.
        fprintf("Resistance is %f\n",fsrResistance); % Print Res.

        if fsrResistance <= 600
            force = (G-7.5E-4)/(3.2639E-7);
        else
            force = (G/6.42857E-7);
            fprintf("\tTheforce is %f\n",force);

            writeDigitalPin(forceArduino,'D7',1);
```

```
            if 250 < force <= 500
                writeDigitalPin(forceArduino,'D6',1);
                if 500 < force <= 1000
                    writeDigitalPin(forceArduino,'D5',1);
                if 1000 < force <= 2000
                    writeDigitalPin(forceArduino,'D4',1);
                    if force > 2000
                        writeDigitalPin(forceArduino,'D3',1);
                end
                end
            end
            end
        end
    elseif fsrVoltage == 0
        fprintf("No Resistance Detected\n");
        writeDigitalPin(forceArduino,'D7',0);
        writeDigitalPin(forceArduino,'D6',0);
        writeDigitalPin(forceArduino,'D5',0);
        writeDigitalPin(forceArduino,'D4',0);
        writeDigitalPin(forceArduino,'D3',0);
    end

end
```

Deliverable

Last Modified: 4/4/21

```
clc;
clear;

LED_num = input("Enter number of LEDs you want to turn on from 1 to 4
 ");
W_0 = 42; % in grams (2L Bottle of Soda)
density_water = 1; % grams/ml.

while LED_num ~= 0

  if LED_num == 1
      R_fsr = 250+W_0;

  elseif LED_num == 2
      R_fsr = 501+W_0;

  elseif LED_num == 3
      R_fsr = 1001+W_0;

  else LED_num == 4
      R_fsr = 2001+W_0;
  end
```

```
      G = 1/R_fsr;


  if R_fsr <= 600
      force = (G-7.5E-4)/(3.2639E-7);
  else
      force = (G/6.42857E-7);
  end
       weight = force/9.81; % Finds weight in g
        volume = (weight/density_water)/29.57; % In ml and convert to
 fl oz.

 fprintf('the volume required is %d fl oz.\n',volume);
 break
  end

  if LED_num == 0
    disp("No water needed!")
end
```

Published with MATLAB® R2020b