Mech103 - Lab 07

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Created by: Erick Valentin Created on: 3/19/21 Last Modified: 3/25/21 Description: This script performes the calculations required to complete the excercises labeled int the Lab07.

TMP Sensor A - Testing Sensor.

Last Modified: 3/25/21 by: Erick Valentin (832105450

```
% Clear Workspace.
clear
%Clear Command Window.
clc

a = arduino('com3','Uno'); % Name Arduino
tmp36Pin = 'A0'; % Establish used sensor pin on board.
ledPin = 'D3'; % Establish used pin on board.
writeDigitalPin(a,ledPin, 1);
voltage = readVoltage(a,tmp36Pin);

tempinCel = (voltage*100)-50;

tempinFa = (tempinCel*1.8)+32;
```

```
Error using Valentin_Lab07 (line 15)
Unable to find Arduino hardware at com3. First argument must be a
 valid serial port, Bluetooth address/name or IP address/hostname.
```

TMP Sensor B - Matlab Programming.

```
clear
clc
spicyArduino=  arduino('com3','Uno'); % Name Arduino
tmp36Pin = 'A0'; % Establish used sensor pin on board.
ledPin = 'D3'; % Establish used pin on board.

disp('Starting Reading...');
threshold >= 5;
dataPoints = 20; % number of data points to capture

% Enter in how long you want the delay to be between readings
delayTime = 5;
```

```
% This gets the voltage from the arduino
voltage(1) = readVoltage(spicyArduino,tmp36Pin);

for j = 2:dataPoints
    % Read the voltage from the arduino

    % Maybe you want to write out the voltage to the computer?

    % Pause for delayTime

    % Check if the temperature being read is greater than threshold
    if voltage(j) >= threshold
        % if above the threshold, turn on the light
    else
            % or else, turn it off
    end
end




disp('Done reading voltages!');

% Convert the voltage array into a temperature array
tempinCel = (voltage*100)-50;

% Figure out how to create a "time" array cooresponding to their delay


% Plot the temperature data


% Convert from C to F
```

Why is it Snowing in October?

Last Modified: 3/25/21 by: Erick Valentin (832105450

```
% Clear Workspace.
clear
%Clear Command Window.
clc

[date_times, voltages] = getVoltages(); % Makes two variables
 containing Date_times and voltages.

tempsC = (voltages*100)-50; % Converts "voltages" array values int
 Celsius temperatures.

tempsF = (tempsC*(9/5)+32); % Converts "tempsC" array values int
 Celsius temperatures.
```

```
bar(date_times, tempsF,'b') % Creates a Bar Graph of the temperatures
 over time.
title("Ft. Collins Temperatures") % Labels Title.
xlabel("Dates and Times") % Labels X-Axis.
ylabel("Temperatures Farenheight (F)") % Labels Y-Axis.
grid on % Displays grid on graph.

freezing = tempsF(tempsF<=32);
```

How was the Rest of the Country

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```
% Clear Workspace.
clear
%Clear Command Window.
clc

[date_times, voltages] = getVoltages(); % Makes two variables
 containing Date_times and voltages.

tempsC = (voltages*100)-50; % Converts "voltages" array values int
 Celsius temperatures.
tempsF = (tempsC*(9/5)+32); % Converts "tempsC" array values int
 Celsius temperatures.

miamiTemperatures = getMiamiTemperatures(); % Makes a variable with
 the Miamy temps.
fairbanksTemperatures = getFairbanksTemperatures(); % Makes a variable
 with the Fairbanks temps.

plot(date_times, tempsF,'b^--'); % Colorado Teps in F.
title("Temperature over Time") % Labels Title.
xlabel("Dates and Times") % Labels X-Axis.
ylabel("Temperatures Farenheight (F)") % Labels Y-Axis.
grid on % Displays grid on graph.
hold on
plot(date_times, miamiTemperatures,'rs--'); % Miami Teps in F.
plot(date_times, fairbanksTemperatures,'vg--'); % Fairbanks Teps in F.
legend('Ft. Collins', 'Miami', 'Fairbanks')
hold off
```

Would a Polar Bear be Happier in Ft. Collins?

Last Modified: 3/25/21 by: Erick Valentin (832105450)

```
% Clear Workspace.
clear
%Clear Command Window.
clc

[date_times, voltages] = getVoltages(); % Makes two variables
 containing Date_times and voltages.
```

```
tempsC = (voltages*100)-50; % Converts "voltages" array values int
 Celsius temperatures.
tempsF = (tempsC*(9/5)+32); % Converts "tempsC" array values int
 Celsius temperatures.

miamiTemperatures = getMiamiTemperatures(); % Makes a variable with
 the Miamy temps.
fairbanksTemperatures = getFairbanksTemperatures(); % Makes a variable
 with the Fairbanks temps.

subplot(1,3,1)
plot(date_times, tempsF,'b^--'); % Colorado Teps in F.
legend('Ft. Collins')

title("Temperature over Time") % Labels Title.
xlabel("Dates and Times") % Labels X-Axis.
ylabel("Temperatures Farenheight (F)") % Labels Y-Axis.
grid on % Displays grid on graph.

subplot(1,3,2)
plot(date_times, miamiTemperatures,'rs--'); % Miami Teps in F.
legend('Miami')

subplot(1,3,3)
plot(date_times, fairbanksTemperatures,'vg--'); % Fairbanks Teps in F.
legend('Fairbanks')


minTemps = [min(fairbanksTemperatures), min(tempsF),
 min(miamiTemperatures)]; % Minimum tems in order Fairbanks, Ft.
 Collins, Miami.
maxTemps = [max(fairbanksTemperatures), max(tempsF),
 max(miamiTemperatures)]; % Maximum tems in order Fairbanks, Ft.
 Collins, Miami.
stdTemps = [std(fairbanksTemperatures),std(tempsF),
 std(miamiTemperatures)];  % Standard Deviation of tems in order
 Fairbanks, Ft. Collins, Miami.
```

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