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// ****************** Lab2.c ***************
// Program written by: Pragna Subrahmanya
// Date Created: 1/18/2017
// Last Modified: 1/18/2019
// Brief description of the Lab:

// An embedded system is capturing temperature data from a
// sensor and performing analysis on the captured data.
// The controller part of the system is periodically capturing size
// readings of the temperature sensor. Your task is to write three
// analysis routines to help the controller perform its function
//   The three analysis subroutines are:
//    1. Calculate the mean of the temperature readings
//       rounded down to the nearest integer
//    2. Convert from Farenheit to Centigrate using integer math
//    3. Check if the captured readings are a non-decreasing monotonic
series
//       This simply means that the readings are sorted in non-
decreasing order.
//       We do not say "increasing" because it is possible for
consecutive values
//       to be the same, hence the term "non-decreasing". The
controller performs
//       some remedial operation and the desired effect of the
operation is to
//       raise the the temperature of the sensed system. This routine
helps
//       verify whether this has indeed happened
#include <stdint.h>
#define True 1
#define False 0

// Return the computed Mean
// Inputs: Readings is an array of 16-bit temperature measurements
//         N is the number of elements in the array
// Output: Average of the data
// Notes: you do not need to implement rounding
int16_t Find_Mean(int16_t const Readings[], int32_t const N){

     int16_t i = 0;
     int16_t sum = 0 ;
     int16_t avg = 0;

     for( i=0; i<N; i++)
     {
          sum = sum + Readings[i];
     }

     avg = sum/N;

     return avg;
```

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// Replace this following line with your solution

}

// Convert temperature in Farenheit to temperature in Centigrade
// Inputs: temperature in Farenheit
// Output: temperature in Centigrade
// Notes: you do not need to implement rounding
int16_t FtoC(int16_t const TinF){
// Replace this following line with your solution

      int16_t TinC =0;

      TinC= TinF - 32;

      TinC *=5;
      TinC /=9;

      return TinC;

}

// Return True of False based on whether the readings
// are an increasing monotonic series
// Inputs: Readings is an array of 16-bit temperature measurements
//         N is the number of elements in the array
// Output: true if monotonic increasing, false if nonmonotonic
int IsMonotonic(int16_t const Readings[],int32_t const N){
// Replace this following line with your solution

      int16_t i = 0;
      int16_t increasing = 1;

      for(i=0; i<N-1; i++)
            {
                  if(Readings[i]>Readings[i+1])
                  {
                        increasing=0;
                  }
        }

      return increasing;
      }
```

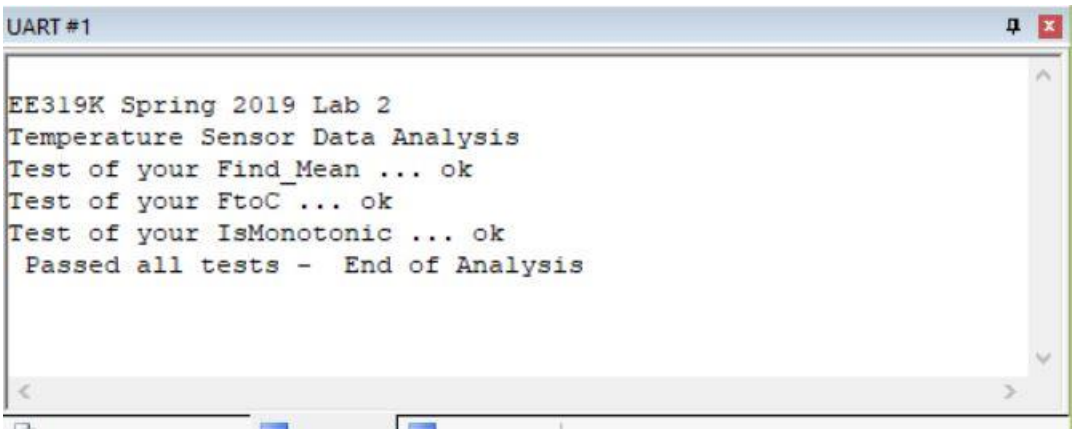
UART #1
EE319K Spring 2019 Lab 2
Temperature Sensor Data Analysis
Test of your Find_Mean ... ok
Test of your FtoC ... ok
Test of your IsMonotonic ... ok
Passed all tests - End of Analysis