MORGAN STATE UNIVERSITY
THE CLARENCE M. MITCHELL, JR., SCHOOL OF ENGINEERING

EEGR 409: C Programming Applications

Assignment 6

Objective: Write a program that reads data from three separate data files (i.e. data1.txt, data2.txt, and data3.txt) and combines the files so that they can be plotted using Microsoft Excel.

Each of these files represents sampled data from a sensor at intervals of 0.5 seconds. Your program should read all data from the three separate files in the correct sequence (data1.txt, then data2.txt then data3.txt) and store into array *y*. Create an array *x* to contain the time values starting from -6 and increment by 0.5.

Create a file 'combined_data.csv' that combines both the *x* and *y* values (separated by a comma) as show below:

```
-6.0,0.073263
-5.5,0.12079
-5.0,0.19915
-4.5,0.32834
-4.0,0.54134
-3.5,0.89252
-3.0,1.4715
-2.5,2.4261
-2.0,4.0
-1.5,36.0
-1.0,30.25
-0.5,25.0
0.0,20.25
0.5,16.0
1.0,12.25
1.5,9.0
2.0,6.25
2.5,4.0
3.0,4.0
3.5,6.25
4.0,9.0
4.5,12.25
5.0,16.0
5.5,20.25
6.0,25.0
6.5,30.25
7.0,36.0
```

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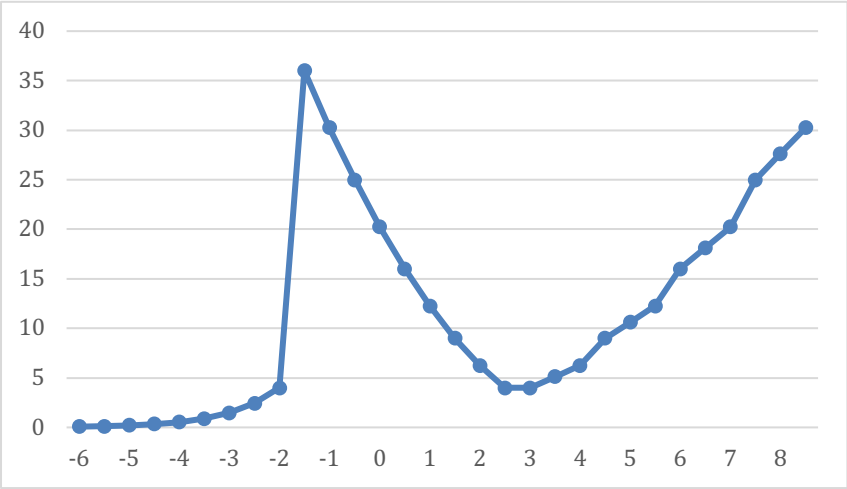
Open the 'combined_data.csv' file in Excel and plot the sensor data vs time.



Requirements:

Your program must implement the following functions:

- *ReadData*: Reads all the data points from the file given in the argument list and stores the data in an array that is also given in the argument list (this method must be called three times in the main function)
- *CombineData:* Accepts 3 arrays for the values of each sensor and another array to hold the combined values
- *WriteData:* Accepts the combined values array, another array of the time values, and the name of the output file and writes the time values and the sensor values separated by a comma to the file name specified

Your functions must use the appropriate parameters given above. Your main function should declare all arrays and call the methods above.

Note: Do not hard code the number of elements in the data files, but you can assume each data file has a maximum of 100 data points.

Grading Rubric:

- Able to read data from files and place in array (50 pts)
- Able to create an array with the right time values (15 pts)
- Able to combine the arrays of data values into a single array (25 pts)
- Able to write the combined arrays with the time array out to a file and visualize the data with a graph in Excel (10 pts)

Please see the instructions on Canvas concerning the requirements for assignment video submissions

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