CIS 1057 Lab Exam Spring 2022

You will write a C program that reads 5 daily temperatures for n days from a file into a matrix, records the daily low, high and average into an array of stats struct and writes the stats back to another file. There will be no other questions for this exam, just this programming problem. A starter file with comments and prototypes and a data file are included to help you complete this exam. Please sign the top of this document and submit it at the end of lab. It will be used for attendance.

Suggested process:

Create a c file named YourNameExam2.c

1. Write a struct that contains 3 doubles: low, high and avg, named stats_t.
2. Write main function.
3. Write function to read the three rows of doubles and 5 columns from file into a matrix. The function should be named read. The function should use scanf to read 5 doubles from each line. The loop should terminate when EOF is returned by scanf. The main function should print the number of rows read from the file. Note that the #defines for ROWS and COLS of the matrix is included in the starter file with all function prototypes.
4. Test that you program opens the file and reads the data properly by calling read from main and returning the matrix as an output parameter.
5. Write function called print_stats to print a stats_t struct to screen.
6. Write a function called print_stats_array to print an array of stats_t structs to screen by repetitively calling print_stats.
7. Write a function called find_low to find a low temp in a row of the temps matrix (Hint: passing temps[i] will pass a row of a matrix).
8. Copy find_low and paste it below find_low. Rename it to find_high and modify it to find the high temp in a row.
9. Write a function calc_avg to calculate the average temp in a row.
10. Write function calc_stats to calculate the low, high and avg for each row, storing the result in the array of stats_t. Note that COLS has the number of elements in each row.
11. Test that your program calculates the stats by printing them to the screen using the print_stats_array function.
12. Write function write to write the stats_t array to a file as shown in the output below.
13. Test that your program writes the file.
14. Close the editor and submit your source code file to Canvas.

The temps.txt file contains 15 temperatures, 5 per row. Use a for loop the reads from the file using fscanf 3 times, reading 5 doubles to the matrix each time. Sample screen output from project:

```
Reading file temps.txt...
Read: 89.5 90.3 90.8 91.2 90.6
Read: 88.4 93.0 93.7 94.3 93.1
```

```
Read: 90.1 91.6 91.0 92.5 91.2
File read complete.

3 rows read from file.

Low: 89.5 High: 91.2 Avg: 90.5
Low: 88.4 High: 94.3 Avg: 92.5
Low: 90.1 High: 92.5 Avg: 91.3

Process returned 0 (0x0)   execution time : 0.715 s
Press any key to continue.
```

The input file (temps.txt):

```
89.5 90.3 90.8 91.2 90.6
88.4 93.0 93.7 94.3 93.1
90.1 91.6 91.0 92.5 91.2
```

The output file:

```
Low     High    Avg
89.5    91.2    90.5
88.4    94.3    92.5
90.1    92.5    91.3
```

Don’t worry about comments. Just focus on your code.

Good Luck!