Programming Assignment #4

Prepare a Lab Report

CS 1428.302, Spring 2018
Instructor: Jill Seaman

Due: in class Thursday, 3/8/2018 (upload electronic copy by 9:00am)

Problem:

Your friend the biology lab assistant needs to calculate the average time it takes each of her rats to run through a given maze. For three days she runs each rat through the maze once, and records the amount of time it takes. Write a C++ program that will, after the test runs are all complete, calculate the average time it took for each of his rats to run the maze, and print a report to a file.

Input: The user should be prompted to input the name and 3 maze times for each rat. The name may have spaces in it. The three maze times will be positive integers. After the user has input the data for each rat, your program should ask the user if they have data for another rat. If they type "Y" or "y", your program should allow them to input data for another rat.

Processing: Compute the average maze time for each of the rats by computing the mean of their 3 maze times.

Output: The program should <u>output a lab report to a file</u> named **"lab_report.txt".** The first row of the report should be a list of column headers that label the data to be output. This should be followed by a row for each rat that lists their name, each of the three maze times, and the average. This should be followed by the word "Superior" if the average is less than than 25. Otherwise, if it is less than 35, it should be followed by the word "Normal". If the average is 35 or over, the program should output "Slow". The final average should be formatted to 1 decimal place. The numerical data in each column should line up under its column header.

```
Name                Time 1 Time 2 Time 3    Avg   Rating
Black Fred            28     40     29      32.3   Normal
Lima Bean            35     40     36      37.0   Slow
Master Splinter      25     27     39      30.3   Normal
Nicodemus            24     25     25      24.7   Superior
```

See the file `output4.txt` on the class website for the console output from running the program to create this output file.

Additional Requirements:

- For full credit, you must use appropriate loop constructs, and your program should work for any number of rats (not always four).

- For full credit, your program should allow spaces in the rat names. You will receive a small point deduction if your program works only for rats without spaces in their names. Hint: use cin >> ws; immediately **before** getline.

- Hint: set up your output file and output the column headers BEFORE the loop that processes the rat names and times.

- Hint: output the data to the file immediately after it is input from the user or computed by your program. Re-use one variable for the time to run the maze.

- All of the output data can be LEFT justified for this assignment.

- The name should be displayed in a width of 20 characters, the numerical data should be displayed in a width of 7 characters each.

- Note that the column headers may be output as one long string with spaces embedded in the proper places.

- Use proper data types (only use float and double when necessary).

- Your program **must compile** and run, otherwise you will receive a 0.

- See the Style Guidelines document on the course website. The grader will deduct points if your program violates the style guidelines.

Logistics:

Name your file **assign4_xxxxx.cpp** where xxxxx is your TX State NetID (your txstate.edu email id). The file name should look something like this: assign4_js236.cpp

There are two steps to the turn-in process:

1. Submit an **electronic copy** using the Assignments tool on the TRACS website for this class (tracs.txstate.edu). Submit the .cpp file only.

2. Submit a **printout** of the .cpp file (only!) at the beginning of class on the day the assignment is due. Please print your name on the front page.

See the assignment turn-in policy on the course website (cs.txstate.edu/~js236/cs1428) for more details, including deadlines, penalties, and where to submit printouts after class.