

Programming Assignment #7

Lab Rats

CS 1428.003, Fall 2019

Instructor: Jill Seaman

Due: before class **Monday, 12/02/2019** (upload electronic copy by 9:30am)

Write a program that manages data about lab rats. The program should use a structure that stores the following data:

- The rat's name
- The rat's weight in ounces
- The amount of time in seconds it took the rat to run the maze

The program should create an array of seven of these structures. Each element is for a different rat in the lab. When the program runs, it should initialize the array using the following data

Rat Name	Weight	Maze time
Ben	6.5	0
Fred	5.8	0
Splinter	7.7	0
Lima Bean	6.5	0
Black Bean	5.8	0
Big Pook	9.8	0
Tiger	7.7	0

Each time the program runs, it should prompt the user to enter the time it took each rat to run the maze (the rat's name should be given as a prompt). These values should be stored in the array. It should then display a table that lists each rat's name, weight, and time. This should be followed by the word "Superior" if the time is less than 30. If the time is 30 or over but less than 35, it should be followed by the word "Normal" and if the time is 35 or over, the program should output "Slow". After the table is displayed, the program should calculate and display the average weight of all of the rats. The name and the time of the rat who ran the maze the fastest should also be displayed.

Sample output is on the class website.

Additional Requirements:

- Use a named constants for the number of rats and other significant values.
- The array of rat data must be processed using loops.
- Top Down Design: your program must perform these four tasks (write a separate function for each one):
 1. Input the maze times from the user.
 2. Display the rat data in a table, with data lining up in columns. One digit after the decimal in the weights.
 3. Calculate the average weight of the rats
 4. Determine the rat with the fastest time.
- If the main job of the function is to compute a value, then it should return that value and not do any output. The output (except for input prompts) should be done in main.
- Since there is only one array in the program you do not need to pass the size as a parameter to the functions (but you can if you want to).

Style:

See the Style Guidelines document on the course website. Especially pay attention to the comments required for functions. **Include the full comments required for your functions this time!** The grader will deduct points if your program violates the style guidelines. Make your program output look nice!

Logistics:

Name your file **assign7_XXXXX.cpp** where XXXXX is your TX State NetID (your txstate.edu email id). The file name should look something like this: assign7_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, (NOT a .cbp file!).
2. Submit a **printout** of the source file at the beginning of class on the day the assignment is due. Please print your name on the front page, and staple if there is more than one page.

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