

PROG 10082 – Assignment #4

Specifications:

Monday, November 24 @ 11:00 pm

This assignment is worth **4%** of your final grade.

Description:

This assignment is based on material covered up to and including formatting console output, repetition structures and arrays. Your task is to create a program that will have the user enter the results of a 100m dash. The program should store each runner as an element of an array and once all results have been entered, print a formatted table of results, determine who won the race and display the average finish time.

1. Design and implement a **Runner** class as follows:
 - a) A runner has the following properties:
 - The name of the runner
 - The country the runner represents
 - Their 100m dash finish time in seconds
 - b) The Runner class should have getter and setter methods for each property.
 - c) The Runner class should have a constructor that initializes all properties based on the parameters passed in.
2. Create a class, **RaceResults**, which tests the implementation of your **Runner** class. Your test class should do the following:
 - Prompt the user to enter the number of runners in the race
 - Create an array of runners and prompt the user to enter the results for each race participant
 - Store each runner's result as an element of the array
 - Once all information has been entered by the user, display the following using printf() when necessary:
 - The name of the runner who won the race
 - The total number of runners in the race and the average finish time

Notes:

- Your program should use self-documenting variables of appropriate data types.
- Use an array to store the runners and their finish times.
- The size of the array should be set dynamically based on user input.
- The average finish time should be rounded to 3 decimal places.
- The following is an example of the expected output from your **RaceResults** program after the user enters 5 runners:

Athlete	Country	Result
=====	=====	=====
Justin Gatlin	USA	9.85
Christophe Lemaitre	France	10.06
Gavin Smellie	Canada	10.30
Usain Bolt	Jamaica	9.77
James Dasaolu	Great Britain	10.21

Usain Bolt is the winner.

There were 5 racers and the average finish time was 10.038s.

- The athlete name and the country should be left-aligned
- All finish times should be aligned at the decimal point

Submission:

You will be submitting two Java files, **Runner.java** and **RaceResults.java**. Each class should have a multi-line comment at the top of your source code with a description of what the class does.

Testing is a vital and often overlooked component of the software development process. Don't forget to test your program to ensure correctness!

Evaluation: This assignment is out of a total of **20 marks** with the following breakdown:

Runner.java	/4
Reading user info and store runners in an array	/6
Calculating and displaying formatted output	/10
TOTAL	/20