Final Project       CS223        Fall 2016

Due : Tuesday December 6, 9:00 AM

**Assignment objectives:**

* Gain experience using strings, arrays, functions and their interactions
* Gain experience using File Input/Output
* Gain experience using structures
* Gain experience using modular programming (functions)
* Reinforce knowledge of previous programming topics
* Continue to refine C programming skills by following the C coding standard
* Learn to apply "C" programming to problem solving

**Problem Description:**   
You are to create a text base game to race 4 cars across the screen and determine the first second and third place. A text file (car.txt) with the name of the driver, type of the race car, car number, and the color of the car is given to you.

**Game Requirements:**

1. The program must give the user a choice; race against another user or run the race with 4 cars automatically
2. Each car cannot move more than 10 spaces at a time
3. Maximum number of spaces (race track) is 90 spaces
4. Display car movements using car number
   1. Cars cant not share the same car number
   2. Display screen must be cleared before next movement.
5. In Two player mode (manual mode) ask users to choose their car then the program should alternatively ask the user to press a key then the cars moves a random number of spaces.
   1. Users cannot choose the same car.

**Program Requirements:**

1. You shall use random number generator for car movement.
   1. Refer to Game Requirement 2 for number limitation.
   2. Auto mode you shall random number generator for car movement and which car to move.
   3. Manual mode you shall random number generator for car movement.
2. You shall use array of structures to read the items from the file
3. The main function must do very little other than calling other functions and passing parameters to those functions.
4. Your program should be **modularly designed** with functions designed to do one task and one task well.
   1. Use of pointers for arrays are encouraged
5. Shall save the result in a file.
6. Shall not use global variables. Pass data back and forth via parameters or as return values.
   1. Shall not use *floating numbers*, meaning any number that if changed would change the execution of your code must defined.
   2. Use defined constants for ALL constants in your program.
7. Make your functions as general as possible so that they can be called more than once if needed.
8. Document your main function as well as every function you write.
9. The **car.txt** file can contain more cars if you want
10. Comments shall not be done after the implementation.
    1. Comments shall show that a design process has been happened.
    2. Comments shall show understanding of the implementation.
11. You shall give credit where credit is due.
    1. Surround any code snip-it or algorithm that is don’t yours with an explanation of what the code/algorithm is doing.

Program Input:

* Car.txt file contains the following data

Kirk Porsche 6 Silver

Spock Ferrari 7 Red

Leia Lamborghini 8 Yellow

Jaba Ford 9 Black

* User chooses Auto or Manual and the car
* User chooses to stop or do another race

Program output

* Any modifications to the cars should be see in the car.txt file.
* Write the following data to a file called **raceresult.txt** with the ranking of the result of the race. Example:

Leia #1

Spock #2

Kirk #3

Jabba #4

* Display the ranking on the screen with all the data

Auto mode display screen example

#6 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

#7 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

#8 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

#9 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

Until the race is over

Manual mode display screen example

#6 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

#8 \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*

General requirement

1. Following comments must be the first lines of your source code

/\* -----------------------------------------------

Submitted By: <Your Name>

Homework Number: <whichever homework you are doing>

Credit to:

<Name or names>

Submitted On: <Date>

By submitting this program with my name,

I affirm that the creation and modification

of this program is primarily my own work.

------------------------------------------------ \*/

1. Next few line of your source code must be comments describing what this program is supposed to do.
2. The first output (display) must be your name
3. The source code file must include comments documenting the design.
4. Indentation and spacing should be used to make the program readable.
5. Throughout this class (including this program you are not permitted to use the following commands: continue, break, exit, or any library functions that perform similarly

**Deliverables:**

Delivery Requirements:   
For this project you must submit a report that includes the following sections:  (NO hard copy of the code in the report)

* Time log
* Describe the REQUIREMENT of this program (what does the customer want), in numbered bulleted format.
* Design, block diagram of functions used.
* Function description
* Comment your implementation (your code)
* Develop at least five TEST SCRIPT to test your program
* Conclusion
* Submit your source code to Canvas the same way you submit home works.

No hard copy of the code is needed; submit the soft copy of your source code (the .c file) to blackboard

**IMPORTANT: You must name your source code as below:**

**Yourusername\_homeworknumber\_cs223**

**Example: behif\_h1\_cs223**