Programming Assignment 4
Due Date: 12/05/2022
User-Defined Data – Structure

Objectives:

- Create Structure template
- Setting Up the Structure Declaration
- Defining a Structure Variable
- Using Arrays of Structures
- Pointers to Structures
- Use Functions and Structures
- Use function prototypes and structures
- Display output in a tabular format
- Compile, test, and debug your program.

Tasks → Question statement

Write a program that fits the following tasks:

A. Externally (before main function) define a name structure template with two members: a string to hold the first name and a string to hold the second name.
B. Externally (before main function) define a student structure template with three members: a name structure, a grade array to hold three floating-point scores, and a variable to hold the average of those three scores.
C. Have the main() function declare an array of CSIZE (with CSIZE = 4) student structures and initialize the name portions to names of your choice. Use functions to perform the tasks described in parts d., e., f., and g.
D. Interactively acquire scores for each student by prompting the user with a student name and a request for scores. Place the scores in the grade array portion of the appropriate structure. The required looping can be done in **main()** or in the function, as you prefer.
E. Calculate the average score value for each structure and assign it to the proper member.
F. Print the information in each structure.
G. Print the class average for each of the numeric structure members.

```
Please enter 3 scores for Flip Snide:
90 92 94
Please enter 3 scores for Clare Voyans:
80 84 98
Please enter 3 scores for Bingo Higgs:
70 90 96
Please enter 3 scores for Fawn Hunter:
89 78 96
                    Flip Snide:    90.0    92.0    94.0   Average = 92.00
                  Clare Voyans:    80.0    84.0    98.0   Average = 87.33
                   Bingo Higgs:    70.0    90.0    96.0   Average = 85.33
                   Fawn Hunter:    89.0    78.0    96.0   Average = 87.67

              QUIZ AVERAGES:    82.25   86.00   96.00      All = 88.08


Process finished with exit code 0
```

Task 1: Create a C Source Code File

In CLion, create a New Project (under the File menu). The type is "C Executable" and the Language Standard is "C11". Replace the "untitled" in the project name with a name of your choosing, such as Prog 4. The project name is the directory (folder) where all of your project files will be stored. It will be easier to locate the files later if you give your projects meaningful names.
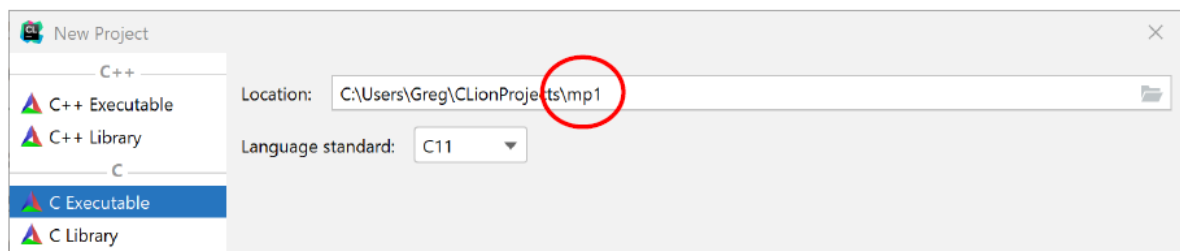
Note: Pay attention to the full pathname of your project. This tells you where the project files are located, which will be needed later when you submit files.

CLion will automatically create a file named main.c, and will put a "Hello, World!" print statement in the main function. If this is your first time using CLion, build and run the project to make sure your environment is set up properly. (Click on the green triangle at the top right of the window.) You should see "Hello, World!" printed in the output area.

Note: Add a comment at the top of your file that includes your name. Ideally, this program header would also contain information about what the program does and how to run it, but for problem sessions, just your name will be enough.

Hint: If you submit this file as is, you'll get 50 points!!

Template:

```c
//Fall 2022 Programming Assignment 4 - Structure
#include <stdio.h>
#include <string.h>
#define LEN 14
#define CSIZE 4
#define SCORES 3

struct name
{
    char first[LEN];
    char last[LEN];
};
struct student
{
  /*

      Enter your code here

   */


};
void get_scores(struct student ar[], int lim);
void find_means(struct student ar[], int lim);
void show_class(const struct student ar[], int lim);
void show_ave(const struct student ar[], int lim);

int main(void)
{
    struct student class[CSIZE] ={
        { "Flip", "Snide"},
        { "Clare", "Voyans"},
        { "Bingo", "Higgs"},
        { "Fawn", "Hunter"}
    };

    get_scores(class, CSIZE);
    find_means(class, CSIZE);
    show_class(class, CSIZE);
    show_ave(class, CSIZE);
    return 0;
}

void get_scores(struct student ar[], int lim)
{
  /*

      Enter your code here

   */
```

```
}

void find_means(struct student ar[], int lim)
{
    /*
        Enter your code here

    */

}

void show_class(const struct student ar[], int lim)
{
    /*
        Enter your code here

    */

}

void show_ave (const struct student ar[], int lim)
{
    /*
        Enter your code here

    */

}
```

<mark>Sample run 1:</mark> (50 point)

```
Please enter 3 scores for Flip Snide:
89 90 77
Please enter 3 scores for Clare Voyans:
89 60 89
Please enter 3 scores for Bingo Higgs:
90 97 79
Please enter 3 scores for Fawn Hunter:
80 90 99
                Flip Snide:   89.0   90.0   77.0  Average = 85.33
              Clare Voyans:   89.0   60.0   89.0  Average = 79.33
              Bingo Higgs:    90.0   97.0   79.0  Average = 88.67
              Fawn Hunter:    80.0   90.0   99.0  Average = 89.67

            QUIZ AVERAGES:  87.00  84.25  86.00     All = 85.75
```

Sample run 2: (50 point)

```
Please enter 3 scores for Flip Snide:
90 92 94
Please enter 3 scores for Clare Voyans:
80 84 98
Please enter 3 scores for Bingo Higgs:
70 90 96
Please enter 3 scores for Fawn Hunter:
89 78 96
                Flip Snide:    90.0    92.0    94.0   Average = 92.00
              Clare Voyans:    80.0    84.0    98.0   Average = 87.33
               Bingo Higgs:    70.0    90.0    96.0   Average = 85.33
               Fawn Hunter:    89.0    78.0    96.0   Average = 87.67

            QUIZ AVERAGES:    82.25   86.00   96.00      All = 88.08
```