PROGRAMMING ASSIGNMENT 1

CS1410 - 100 points

OUTCOMES

After you finish this assignment, you will be able to do the following:

- Define and initialize variables
- Prompt the user for input
- Read input from the keyboard
- Use loops and conditionals
- Format output with **`setw`**

DESCRIPTION

Write a C++ program that keeps asking the user to enter integers between 1 and 100 or -1 to terminate, and then:

- If -1 is entered, the program should terminate its loop and display the count of valid integers (those between 1 and 100) that were entered, their minimum, their maximum, and their average (a decimal number) in a format similar to the sample output below.
- If 0, less than -1, or greater than 100 is entered, the program should ignore the entered integer (and not count it), display an **`"Invalid integer; must be between 1 and 100."`** message, and prompt the user to enter another integer.
- Otherwise, the program should increment the count of valid integers by 1, save the entered integer as the minimum if indeed it is less than any of the previously seen integers, and save the entered integer as the maximum if it is greater than any of the previously seen integers.

Below is a sample ouput:

```
Enter an integer between 1 and 100 (-1 to terminate):
45
Enter an integer between 1 and 100 (-1 to terminate):
68
Enter an integer between 1 and 100 (-1 to terminate):
0
Invalid integer; must be between 1 and 100.
Enter an integer between 1 and 100 (-1 to terminate):
89
Enter an integer between 1 and 100 (-1 to terminate):
```

```
122
Invalid integer; must be between 1 and 100.
Enter an integer between 1 and 100 (-1 to terminate):
19
Enter an integer between 1 and 100 (-1 to terminate):
-1

 Count  Minimum  Maximum  Average
     4       19       89    55.25
```

HINT: Use the **`setw()`** manipulator from the **`<iomanip>`** header file to display the results. Check Worksheet 02 for examples of using **`setw()`**.

INSTRUCTIONS

For this assignment, you need to have a GitHub account. If you don't have one already, please sign up for one at https://github.com/.

Getting the assignment starter code from GitHub:

- Sign in to GitHub.
- Go to the assignment link https://classroom.github.com/a/ES3u0_SI and accept the assignment. This should create a private repository under your GitHub username for this assignment. Click on the given link to open this repository and see the starter code.
- Click on the **Clone or Download** button dropdown and copy the given URL.
- Navigate to your assignments folder (or any folder you want this assignment to be placed in) and open it using Visual Studio code.
- In Visual Studio Code, open a new terminal and then run:

  `wsl` (for Windows 10 only)

  `git clone THE_URL_YOU_COPIED`

  This will download the starter code of this assignment from GitHub and create a folder for it. This is the folder where your program file(s) should reside.
- Open the assignment folder in Visual Studio Code and start writing your program.

Compiling your C++ program:

- From inside the assignment folder in Visual Studio Code, open a new terminal and run:

  `wsl` (for Windows 10 only)
- To compile your program run:

  `make`

  This command will call the C++ compiler on your program, compile it, and, if no compilation errors are found, create an executable program named "**`run`**" for it. If there are compilation errors, read the console error messages and then go back to your

source files (.cpp and/or .h) and fix them. Save your changes and run the "**make**" command to compile the program again.

- To run your program, run:

  ./run

- To clean (remove) old compilation files and start over, run the command:

  make clean

  You can now run the "**make**" command to compile your program again and the "**./run**" command to run it.

Submitting your program to GitHub:

- Make sure to save your changes and commit them to GitHub when you are done. You can do that by running the following commands from inside your assignment folder:

  wsl (for Windows 10 only)

  git add .

  git commit -m 'short commit message goes here'

  git push

  Make sure to do this at least once by the deadline. For your final submission, I recommend using "**Final submission**" for the commit message. **Note that committing changes is not enough; you have to push them to GitHub; otherwise, your changes will stay on your local machine and I will not be able to see your submission.**
- Go to your assignment repository in github.com and make sure your changes are there.
- Click on the **Clone or Download** button dropdown and copy the given URL. Go to Canvas and submit the copied URL. **This URL must be submitted in Canvas after you make your "Final submission" to GitHub.**

RUBRIC

CRITERIA	POINTS
Use of variables	10
Loop	20
Input validation	20
Count, minimum, maximum, and average calculations	20
Formatted output with **setw()**	20
Readable, commented, and properly indented code	10
TOTAL	100