CS 202 - Spring 2018
Dr. Williams
Assignment 1
Grade formula: SCE * (CS + VS + PD)
Maximum raw score: 4 * (4 + 4 + 4) = 48
Maximum scaled score: 60

This assignment involves writing an interactive program that modifies values in a two-dimensional array that are read in from a file where the filename is given at the command line.

Suppose floating-point values exists in a file as such:

```
3.3 1.1 8.22 6.45
2.1 3 5 7
```

We would like to read these values into a two-dimensional array and manipulate them in the following ways:

1) Increment each value by 1
2) Decrement each value by 1
3) Add a specific floating-point value to each value

For the input, you may assume the following:

- There is at least one value in the file, no more than 10 values in one line, and no more than 10 lines
- Every value in the file is separated by one or more spaces
- Every line will have an identical number of values (e.g. 4 lines with 5 values in each line, or 2 lines with 8 values in each line, etc.)
- The file is formatted properly (e.g. no weird values like strings in the file)
- The file ends with a newline -- a test file can be found in the `/home/williams/public/cs202/assignments/01` directory on bobby.

See first the example compilation, execution, and test of a program on the following page, which **your program should match exactly**. My input is in bold. Further details will be provided on the page after that.

```
[williams@bobby 01]$ ls
a1.cpp  test
[williams@bobby 01]$ g++ -std=c++11 -Wall -Werror -Wpedantic -Wextra a1.cpp
[williams@bobby 01]$ cat test
3.3 1.1 8.22 6.45
2.1 3 5 7
[williams@bobby 01]$ ./a.out
Error, filename not provided!
[williams@bobby 01]$ ./a.out fakefilename
Error, file could not be opened!
[williams@bobby 01]$ ./a.out test
1. Increment all values by 1
2. Decrement all values by 1
3. Add value to entire array
4. Exit
Select an option: 1
       4.3       2.1      9.22      7.45
       3.1         4         6         8
1. Increment all values by 1
2. Decrement all values by 1
3. Add value to entire array
4. Exit
Select an option: 2
       3.3       1.1      8.22      6.45
       2.1         3         5         7
1. Increment all values by 1
2. Decrement all values by 1
3. Add value to entire array
4. Exit
Select an option: 3
Enter a value: 5.1
       8.4       6.2     13.32     11.55
       7.2       8.1      10.1      12.1
1. Increment all values by 1
2. Decrement all values by 1
3. Add value to entire array
4. Exit
Select an option: 30
Invalid option!
1. Increment all values by 1
2. Decrement all values by 1
3. Add value to entire array
4. Exit
Select an option: 4
[williams@bobby 01]$
```

Details:

- Reference the rubric guidelines regarding requirements, including the Allman indent style
- Place functions after the main body
- Use a `#define` preprocessor directive for the array size
- Use `double` for floating-point values
- Write at least 3 functions aside from `main`: one for printing the array, one for modifying values in the array, and one for reading the input from the file
- Get the name of the data file via command line argument and:
    - If no filename is provided then an error should display
    - If a filename is provided but it does not exist then a different error should display
- Use a `switch/case` for the logic related to menu options
- Only after options 1, 2 and 3 are successfully completed, the program should print out the two-dimensional array with values displayed using `setw(10)` as shown in the example
- For reading the file, get one line from the file using getline, then use `istringstream` to extract values from it
- Submit to `williams` on bobby with assignment code `01` by the deadline
- Additional details on bobby, the submit script, etc. can be found on https://tux.cs.unlv.edu/wiki