CS1580 - Introduction to Programming Lab (FS2024)
Lab 10

Lab Objectives

In this lab, you will be implementing the following topics:
- Random Number Generation
- Arrays

Lab Task: Max & Min in an Array

In this assignment, you will write a program that creates an array with randomly generated numbers and finds the maximum and minimum number in that array.

In functions.cpp, write the following functions.

- `void generateArray(int arr[], int size);`
  Populates the scrolls array with random integers between **100** and **1000**.

- `void displayArray(const int arr[], int size);`
  Displays the array elements

- `void findMax(const int arr[], int size);`
  Finds maximum element in the array and its index

- `void findMin(const int arr[], int size);`
  Finds minimum element in the array and its index

- `void belowAboveAvg(const int arr[], int size);`
  Computes the average of input array, and prints
    - the number of elements that above average, and
    - the number of elements that below average

In the header.h, define all your functions.

In the main.cpp,
1. Declare array size as 10, and `srand(time(0))`
2. Populate the array with random numbers and print the array.
3. Find the maximum and minimum numbers and print them.
4. Call the `belowAboveAvg()` function to print the number of elements that are below & above the average.

Please document all the functions.
Follow proper coding standards (indentations, variable names)

Sample Output

```
Generated array: 145, 678, 233, 902, 501, 324, 789, 210, 456, 367

Maximum value: 902 at position 3
Minimum value: 145 at position 0

Average value: 460.5

Numbers above average: 5
Numbers below average: 5
```

Gitlab Cloning Instructions

- Open the browser and go to https://git-classes.mst.edu/. Click on the Lab10 repository named *2024-FS-303-lab10-<your_username>*
- Click on 'Clone' button and copy the HTTPS link.
- Open Putty and
  - Change the directory to SDRIVE: `cd SDRIVE`
  - Clone the repository: `git clone <copy_the_HTTPS_link_here>`
  - Change the directory to cloned repository: `cd 2024-FS-303-lab10<your_username>`
- Start coding by opening a new file in nano: `nano main.cpp`

Compiling Instructions

- To run your code, `fg++ main.cpp`
- To get the output, `./a.out`

Submission Instructions

Push your code to your gitlab account.

- Add all your files to the repository, `git add .`
- Commit your changes, `git commit -m "<your_message_goes_here>"`
- Push the changes, `git push`