Lab 2

Assignment 1: Function with Array

Create a C program that calculates the sum and average of an array of integers. You should implement the following functions:

- `int sum(int arr[], int size)` - This function takes an array of integers and its size as parameters and returns the sum of all the elements in the array.
- `double average(int arr[], int size)` - This function takes an array of integers and its size as parameters and returns the average of the elements in the array.

```
PS C:\Users\wes\github-repos\cs3150_fall2023\Lab2> & '.\wshakespear_Lab 2_Assignment 1.exe'

Testing functions with array:
{ 1, 2, 3, 4, 5, 6, 7, 8, 9, }
The sum is: 45
The average is: 5.000000


Testing functions with array:
{ 103, 103, 101, }
The sum is: 307
The average is: 102.333333
```

Assignment 2: Static and Automatic Storage

Write a C program that demonstrates the difference between static and automatic storage for variables. Create a function that uses a static variable to count the number of times it has been called and another function that uses an automatic (local) variable to count the number of times it has been called. Demonstrate how the static variable retains its value between function calls, while the automatic variable does not.

```
PS C:\Users\wes\github-repos\cs3150_fall2023\Lab2> & '.\wshakespear_Lab 2_Assignment 2.exe'

Running function that increments a global (static) variable:
Run: 1
Run: 2
Run: 3
Run: 4
Run: 5


Running function that increments a local variable:
Run: 1
Run: 1
Run: 1
Run: 1
Run: 1
```

Lab 2

Assignment 3: Array Manipulation

Develop a C program that performs various operations on arrays. Create functions for the following tasks:

- `void initializeArray(int arr[], int size)` - This function initializes an array of integers with random values between 1 and 100.
- `void printArray(int arr[], int size)` - This function prints the elements of the array.
- `int findMax(int arr[], int size)` - This function finds and returns the maximum value in the array.
- `int findMin(int arr[], int size)` - This function finds and returns the minimum value in the array.
- `void reverseArray(int arr[], int size)` - This function reverses the order of elements in the array.

In your `main` function, create an array of integers, initialize it, and then use the above functions to display the array, find its maximum and minimum values, and reverse the array.

```
PS C:\Users\wes\github-repos\cs3150_fall2023\Lab2> & '.\wshakespear_Lab 2_Assignment 3.exe'

Test:  initializeArray

Test:  printArray
{ 90, 34, 72, 65, 1, 37, 38, 6, 48, 3, }

Test:  findMax
Result: 90

Test:  findMin
Result: 1

Test:  reverseArray
Result:
{ 3, 48, 6, 38, 37, 1, 65, 72, 34, 90, }
```