Name: Muhammad Huzefa Farooq
CMS ID: 325416
Degree, Syndicate: DE-41 MTS(A)

Data Structures and Object-Oriented Programming

Lab Report

Lab No. 3

In the 3rd Lab of Data structures and object-oriented programming, we were taught about,

- Vectors
- Vectors Modifiers
- Vectors Capacity

Vectors VS Arrays

1. **Size:**
   Size of array is fixed whereas vectors can be resized. The modifier used for resizing the vector is

```
NameOfVector.resize(Size);
```

2. **Memory:**
   Vector occupies much more memory in exchange for the ability to manage storage

and grow dynamically whereas Arrays are memory efficient data structure.

3. **Data Type:**
   Vector is derived from Collection which contains more generic data type whereas Array is fixed and store more strong data type.

4. **Initialization:**
   Vectors are initialized as:

```
int NameOfArray{Size};
```

   Arrays are initialized as:

```
vector<int>NameOfVector;
```

5. **Entering Values:**
   In vectors we can enter values from start till end one after the other but we can't enter any value randomly. Whereas in arrays, we can add values randomly using index number.

6. **Storing Elements:**
   Vector store elements in a contiguous memory location and allow direct access to an element using subscript operator whereas Array comprises the elements with their memory location which are contiguous in nature.

7. **Time Consumption:**
   Vectors take more time in accessing the elements whereas arrays take very less time to accessing the elements. As mentioned above, arrays are contagious in nature.

8. **Duplication:**
   Vectors and arrays both permit duplicate and null values to be stored as element.

9. **Order of Elements:**
   They both are ordered collection classes as they maintain the elements insertion order.

10. **Removing Elements:**
    Elements can be removed in vectors by using the following modifier,

```
NameOfvector.erase(NameOfvector.begin());
```

    The above modifier erases the first element of the vector.