Graded Assignment 1

Q1. List and explain five member-methods of string class of C++. (No functions of C programming languages).

Solution.

1. **length() or size()** : These class methods returns as unsigned int , the number of valid characters in the string.

2. **push_back()**: This function is used to input a character at the end of the string.

3. **pop_back()**: This function is used to delete the last character from the string.

4. **begin() & end()**: This function returns an **iterator** to **beginning and end** of the string.

eg.

```
string str = "ZaidAli";
cout << "The string using forward iterators is : ";
for (it=str.begin(); it!= str.end(); it++)
cout << *it;
cout << endl;
```

Output: The string using forward iterators is : ZaidAli

5. **capacity()**: This function returns the capacity allocated to the string, which can be equal to more than the size of the string.Additional space is allocated so that when the new characters are added to the string, the operations can be done efficiently.

Q2. Compare Cstring and string class, state similarity and differences.

Solution.

Cstrings

1. Called as null terminated strings. The C string is an array of characters.

2. Since char is a built-in data type, no header file is required to create a C string. However, The C library header file **<cstring>** contains a number of utility functions that operate on C strings.

3. Comparing C strings using the relational operators ==,!=,>,<,>=, and <= does not work correctly, since the array names will be converted to pointers.

4. Size of the character array has to allocated statically, more memory cannot be allocated at run time if required. Unused allocated memory is wasted in case of character array.

5. Implementation of character array is faster than std:: string.Strings are slower when compared to implementation than character array.

String in Cpp

1. A string is a class which defines objects that be represented as stream of characters.

2. In case of strings, memory is allocated dynamically. More memory can be allocated at run time on demand. As no memory is preallocated,no memory is wasted.

3. The strcmp() function can be used to implement various relational expressions:

Q3.

Program:

```
#include <iostream>
#include <string>
using namespace std;

int main(){
string str1, str2;
// Creating two obj of class String
cout << "Enter first string :";
cin >> str1;
cout << "Enter substring to find in first string " << str1 << " :";
cin >> str2;
int index=0 ;
// Using find function to get the index of str2 in str1
index = str1.find(str2);
if(index == -1){
cout << "No such substring found"<<endl;
}
else
cout <<"The index of "<< str2 << " in " << str1<< " is : " << index<< endl;
}
```

Output:

```
zaid University_stuff $ g++ Substring.cpp
zaid University_stuff $ ./a.out
Enter first string :AATAGATGTAA
Enter substring to find in first string AATAGATGTAA :ATG
The index of ATG in AATAGATGTAA is : 5
zaid University_stuff $
```