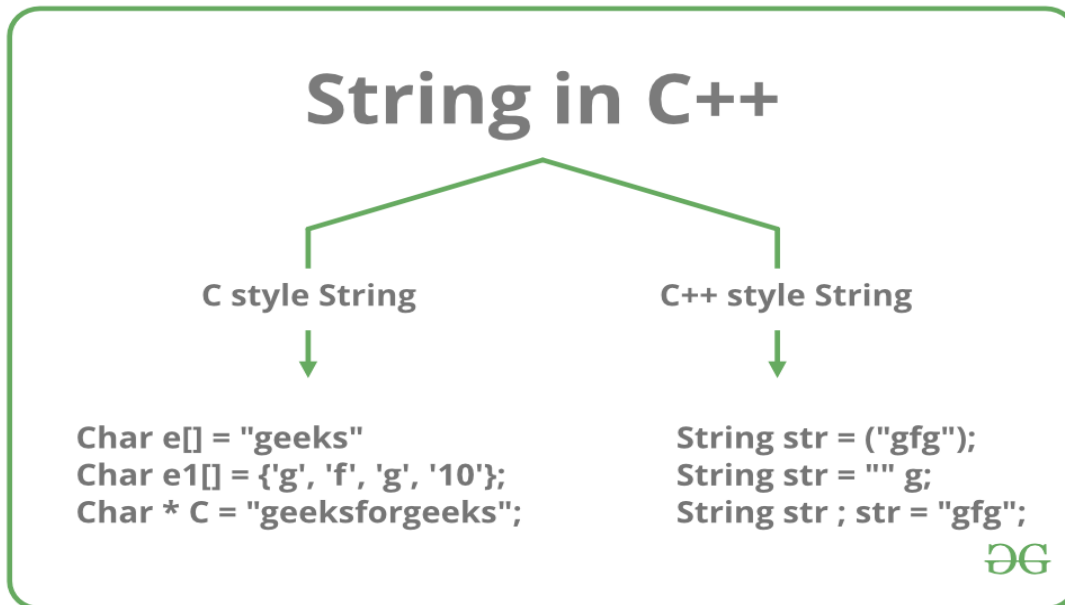


Lecture 9

C++ Strings

A **string** is a variable that stores a sequence of letters or other characters, such as "Hello" or "May 10th is my birthday!".



1) C-style strings:

The C-style character string originated within the C language and continues to be supported within C++. This string is actually a one-dimensional array of characters which is terminated by a **null** character '\0'. Thus a null-terminated string contains the characters that comprise the string followed by a **null**. We will use `<cstring.h>`.

Examples:

```
char greeting[6] = {'H', 'e', 'l', 'l', 'o', '\0'};
char greeting[ ] = "Hello";
```

Following is the memory presentation of above defined string in C/C++

Index	0	1	2	3	4	5
Variable	H	e	l	l	o	\0
Address	0x23451	0x23452	0x23453	0x23454	0x23455	0x23456

Program 1)

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

int main() {

    char greeting[6] = {'H', 'e', 'l', 'l', 'o', '\0'};
    cout << "Greeting message: ";
    cout << greeting << endl;
    return 0;
}
```

Output:

Greeting message: Hello

Program2 : C++ program to display a string entered by user.

```
char a[100];
cout<<"Enter a string:"<<endl;
cin>>a;
cout<<"you entered:"<<a<<endl;
cout<<"Enter another string:";
cin<<a;
cout<<"you entered:"<<a<<endl;
```

```
return 0;}
```

Output:

```
Enter a string:Ahmed
```

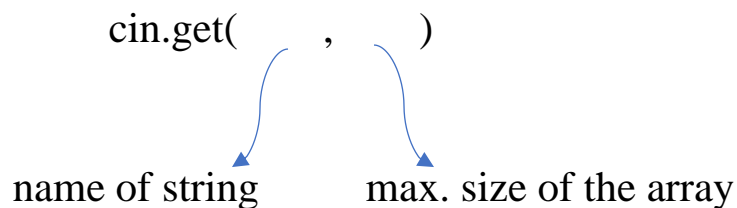
```
you entered:Ahmed
```

```
Enter another string:My name is Ahmed
```

```
you entered:My
```

So, we will use `cin.get` instead of `cin`. What is `cin.get`??

`cin.get`: is function to read a text with blank spaces. It takes two arguments:

**Program 3**

```
int main(){
char b[90];
cout<<"Enter a string:"<<endl;
cin.get(b,90);
cout<< you entered:<<b;
return 0;}
```

Output:

```
Enter a string: My name is Ahmed
```

```
you entered: My name is Ahmed
```

Program 4

```
int main()
{
char name[25];
cin.get(name, 25);
cout << name;
return 0;}
```

2) string object:

This type has no fixed length. It can be extended as required. We will use `<string.h>`

Program 5

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

int main() {
    string myString = "Hello";
    cout << myString[1];
    return 0;
}
```

Output

e

Program 6

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

int main() {
    string myString = "Hello";
    myString[0] = 'J';
    cout << myString;
    return 0;
}
```

Output

Jello

Program 7 Merge two strings

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

```
int main () {
    string x = "10";
    string y = "20";
    string z = x + y;
    cout << z;
    return 0;}
```

Output

1020

Program 8

```
#include <iostream>
#include <string>
using namespace std;
int main() {
    string fullName;
    cout << "Type your full name: ";
    getline (cin, fullName);
    cout << "Your name is: " << fullName;
    return 0;}
```

Output

Type your full name: Ahmed Ali Esa
Your name is: Ahmed Ali Esa

getline(cin, string name) this function used for entering instead of cin .

Program 9

Find the length of string object.

```
#include <iostream>
#include <string>
```

```
using namespace std;
int main() {
string x="c++ program";
cout<< x.size( );
return 0;}
```

Output

11

Program10

Find the frequency of character in a string.

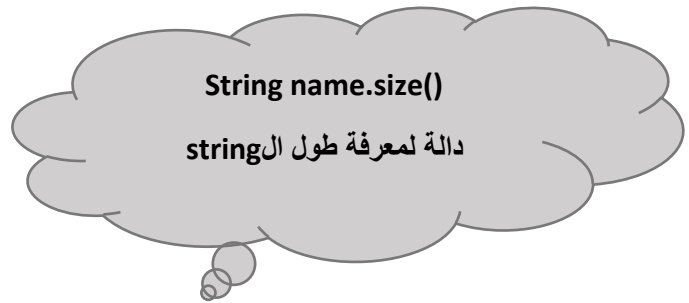
```
string x="my father is a teacher";
char freq='a';
int count=0;
for(int i=0; i<x.size();i++){
if (x[i]==freq){
count++;}}
cout<<count;
return 0;}
```

Output

3

Program 11 Calculate length of string using c-style string

```
int main(){
char s[1000];
int i;
cin.get(s,1000);
for (i=0;s[i]!='\0';i++)
cout<<i;
return 0;}
```



Insert and replace strings

1) String name.insert(position,"character to be inserted")

```
str.insert(3,a)
```

If str=abcd

After insertion str=abcd

2) String name.replace(position,length of the replaced character,character to be replaced with)

```
str=xyz
```

```
str(2,1,mm)
```

After replacement str=xymm

Program12

```
#include <iostream>
#include <string>
using namespace std;
int main() {
string s="cs106B computers";
cout<<s<<endl;
s.insert(7,"kind of ");
cout<<s<<endl;
s.replace(7,7,"mini");
cout<<s<<endl;
return 0;}

```

Output

```
cs106B computers
cs106B kind of computers
cs106B minicomputers
```