

LECTURE 15

1. String:

In C++ strings of characters are implemented as an array of characters. In addition a special null character, represented by `\0`, is appended to the end of string to indicate the end of the string.

General Form of String:

```
char String-name [ size ];
```

Examples: `char name [10] = "Mazin Alaa";`

→ `'M', 'a', 'z', 'i', 'n', ' ', 'A', 'l', 'a', 'a', '\0'`


`char str [] = "ABCD";`

→ `'A', 'B', 'C', 'D', '\0'`

```
str [0] : 'A'  
str [1] : 'B'  
str [2] : 'C'  
str [3] : 'D'  
str [4] : '\0' ↔ null
```

2. Read / Write / Process Array Elements:

Example 1

 Write C++ program to print string, then print it character by character:

```
#include<iostream.h>  
void main( )  
{  
    char s [ ] = "ABCD";  
    cout << "Your String is: " << s << endl;  
    for ( int i =0; i < 5; i++ )  
        cout << "S[" << i << "] is: " << s [ i ] << endl;  
}
```

Output is:

```
Your String is: ABCD  
S[0] is: A  
S[1] is: B  
S[2] is: C  
S[3] is: D  
S[4] is:
```

Example 2



Write C++ program to convert each lower case letter to upper case letter:

```
#include<iostream.h>
#include<ctype.h>
void main( )
{
    char s [ ] = "abcd";
    cout << s << endl;
    for ( int i =0; i < 4; i++ )
        s [i] = char(toupper (s[i] ));
    cout << s;
}
```

Note:

There are several ways to read and write (there are several input/output function) like:

```
cin.getline ( str, 10 );
cin.get ( ch );
cin.ignor ( 80, '\n' );
cin.putback ( ch );
cout.put ( ch );
```

Apply it ...

3. Member Function of String:

The string library has many member functions of string like:

Member Function	Functionality	Example
strlen (string)	Return the length of the string	<pre>a [] = "abcd"; cout << strlen (a);</pre>
strcpy (string2, string1)	Copy the content of the 1 st string into the 2 nd string	<pre>char a[]= "abcd" , b[]=" "; strcpy (b , a); cout << a << b;</pre>
strcat (string1, string2)	Append the content of the 2 nd string into the end of the 1 st string	<pre>char a[]= "abcd" , b[]="1234"; strcat (a , b); cout << a << b; abcd1234 1234</pre>
strcmp (string1, string2)	Return 0 if the 1 st string is equal to the 2 nd string. Return a Positive number if the 1 st string is greater than the 2 nd string. Return a Negative number if the 1 st string is smaller than the 2 nd string.	<pre>char a[]= "abcd" , b[]="abcd"; cout << strcmp (a , b);</pre> <p>0 if a == b + if a > b - if a < b</p>

4. stdlib Library:

The stdlib library has many member functions of string like:

Member Function	Functionality	Example
A atoi (a)	Converts string to int type.	<pre>int i; char a [] = "1234"; i = atoi (a);</pre>
A atof (a)	Converts string to float type.	<pre>float f; char a [] = "12.34"; f = atof (a);</pre>
itoa (i , a , 10);	Converts integer number to alphabet (char or string type).	<pre>int i = 1234; char a [] = ""; cout << itoa (i , a , 10);</pre>

WORK SHEET (7)

String

Q1: Write C++ program to print a string, and then print it character by character *in reverses order*.

i.e:

```
abcd → a
      b
      c
      d
```

Q2: Write C++ program to check each character in the string to convert it to lower case letter if it's an upper case letter and convert it to upper case letter if it's a lower once.

Q3: Write C++ program to read a sentence and print its words separately.

Q4: Write C++ program to apply the following instructions:

- `cin.getline (str, 10);`
- `cin.get (ch);`
- `cin.ignor (80, '\n');`
- `cin.putback (ch);`
- `cout.put (ch);`

Q5: Write C++ program to apply the following instructions:

- `strlen (string)`
- `strcpy (string2, string1)`
- `strcat (string1, string2)`
- `strcmp (string1, string2)`

Q5: Write C++ program to apply the following instructions:

- `atoi (a)`
- `atof (a)`
- `itoa (i, a, 10);`