كلية العلوم

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# Lecture: 6

# String

**Subject: Structured Programming**
**First Stage**
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# 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:

```cpp
#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;
}
```

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

# 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. | int i;  char a [ ] = "1234";<br>i = atoi (a); |
| **A atof ( a )** | Converts string to float type. | float f;  char a [ ] = "12.34";<br>f = atof (a); |
| **itoa ( i , a , 10);** | Converts integer number to alphabet (char or string type). | int i = 1234;  char a [ ] = "";<br>cout << itoa ( i , a , 10); |

# WORK SHEET (7)
## String

**Q1:** Write C++ program to print a string, and then print it character by character *in reveres 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:
- ➤ i atoi ( a )
- ➤ f atof ( a )
- ➤ itoa ( i , a , 10);