STRINGS

Week 8

Strings

- A **string** is any sequence of characters *enclosed* in double quotes -- "Salam Shabab".
- There is no separate data type for strings as **char**, **integer**, **float** or **double**.
- Instead, a string is represented in C as an array of type **char**.

Strings

- We can declare and initialize a string variable using any of the following:

```
char str1[20] = {’S’,’a’,’l’,’a’,’m’,’
’,’S’,’h’,’a’,’b’,’a’,’b‘,’\0’}; //as other arrays
 char str2[20] = "Salam Shabab"; //with size
 char str3[]= "Salam Shabab"; //without size
```

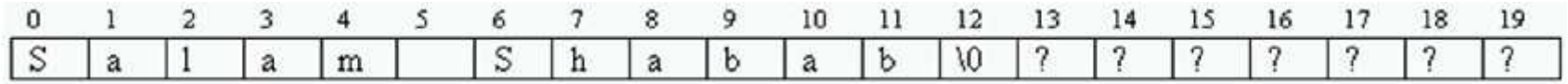
- The string is terminated by the **`\0`** character:

Strings

- For example, the declaration:

  char str[20] = "Salam Shabab";

  is actually represented in the memory as shown below:



Input / Output of strings

- We can use %s to read and print a string

```
printf("Name is %s \n", Name);

scanf("%s", str);
```

Input/Output with gets and puts

- A problem with scanf when reading a string is that it stops scanning the moment it encounters a white space.
- Thus, it cannot scan a string such as: “King Fahd University” in one variable.
- An alternative to scanf is the function gets that takes a string variable as argument.

```
char school[SIZE];
gets(school);
```

- The gets function continue to scan for characters until it encounters the new line character – until the user types the enter key.

Input/Output with gets and puts

- Similar to the function gets, the function puts can be used to print a string.

```
puts(school);
```

String.h

- To use some operations or functions on strings, we need to include file string.h

  #include<string.h>

- So, we can use functions
  - strcpy(s1, s2)
  - strlen(s)
  - strcmp(s1, s2)
  - strcat (s1, s2)

String Functions

strcpy(s1, s2)

- we can not use = with string
- **strcpy** is copying s2 into s1

String Functions

strlen(S)

- Return the length of string S
- strcpy(S, “industrial robot”);
- strlen(S) will return 16

String Functions

strcmp(s1, s2)

- It is for comparison of s1 and s2
- It return 0 if s1=s2
- Return –ve if s1 is less than s2
- Return +ve if s1 is greater than s2

String Functions

strcat(s1, s2)

- It appends s2 to the end of s1

Array of Strings

- To represent arrays of strings we need 2-dimensional arrays of characters.
- The first-dimension represents the number of strings in the array and the second-dimension represents the strings.
- The following are statements to declare an array to store up to 30 names, each of maximum length, 25 characters.

```
#define NUM_NAMES 30
#define NAME_LEN 25
...
char names[NUM_NAMES][NAME_LEN];
```

Array of Strings

- We can also initialize an array of strings at declaration in the following manner:

- ```
  char month[12][10] = {"January", "February", "March",  "April",
                        "May", "June", "July", "August",
                        "September", "October", "November",
                        "December"};
  ```
  ```