

# Note 2:

## Streams, printf() and scanf()

### 1 Streams

A stream acts in two way, it is the source and the destination of data. Streams are associated with a physical device such as a monitor or with a file stored on the secondary memory.

C language supports two formatting functions 'printf' and 'scanf'. printf is used to convert data stored in the program into a text stream for output to the monitor, and scanf is used to convert the text stream coming from the keyboard to data values and stores them in program variables.

In short, printf is used to print something on the screen and scanf is used to take some input from the user.

### 2 printf()

The syntax of the printf function is as follows:

```
printf("control string", variable_list);
```

The function accepts two parameters, a control string and a variable list. The control string may also contain text to be printed like instructions to the user, captions, identifiers, or any other text.

Each control string must begin with a % sign. The % character specifies how the next variable in the list of variables has to be printed.

Type specifiers are used to define the type and the interpretation of the value of the corresponding argument.

- c - For single characters
- d - For integer values
- f - for floating point numbers
- s - For a sequence of characters (strings).

Here is an example of a printf statement.

```
#include<stdio.h>
int main() {

printf("Hello World")

}
```

OR

```
#include <stdio.h>
int main() {

printf("%d", 5)

}
```

To print a value from a variable:

```
#include<stdio.h>
int main() {
    int x = 5;
    printf("The Value of x is: %d", x)
}
```

### 3 Scanf

The scanf() function is used to read formatted data from the keyboard.

The syntax is as follows:

```
scanf("control string", arg1, arg2, ..., argn)
```

The control string specifies the type and format of the data that has to be obtained from the keyboard and stored in the memory locations pointed by arguments. (See example below)

For now we will just understand that the scanf function is used to store values in memory locations associated with variables. For this, the function should have the address of the variable. The address of the variable is denoted by an " " sign followed by the name of the variable.

Ex:

```
#include<stdio.h>

int main(void) {
    int x;
    printf("Enter the value of x: ");
    scanf("%d", &x);
}
```

what the scanf does here is store the input value from the user to the address of the variable x.

There are also many rules and many formatting methods that can be done, but that would get pretty complex for now. So we will come back to that later.