

Printf and Scanf

- printf() and scanf() functions are inbuilt library functions in C which are available in C library by default. These functions are declared and related macros are defined in "stdio.h" which is a header file.
- We have to include "stdio.h" file as shown in below C program to make use of these printf() and scanf() library functions.

1. C printf() function:

- printf() function is used to print the "character, string, float, integer, octal and hexadecimal values" onto the output screen.
- We use printf() function with %d format specifier to display the value of an integer variable.
- Similarly %c is used to display character, %f for float variable, %s for string variable, %lf for double and %x for hexadecimal variable.
- To generate a newline, we use "\n" in C printf() statement.

Note:

- C language is case sensitive. For example, printf() and scanf() are different from Printf() and Scanf(). All characters in printf() and scanf() functions must be in lower case.

Example program for C printf() function:

```
#include <stdio.h>
int main()
{
    char ch = 'A';
    char str[20] = "fresh2refresh.com";
    float flt = 10.234;
    int no = 150;
    double dbl = 20.123456;
    printf("Character is %c \n", ch);
    printf("String is %s \n", str);
    printf("Float value is %f \n", flt);
    printf("Integer value is %d\n", no);
    printf("Double value is %lf \n", dbl);
    printf("Octal value is %o \n", no);
    printf("Hexadecimal value is %x \n", no);
    return 0;
}
```

Output:

```
Character is A
String is fresh2refresh.com
Float value is 10.234000
Integer value is 150
Double value is 20.123456
Octal value is 226
Hexadecimal value is
96
```

You can see the output with the same data which are placed within the double quotes of printf statement in the program except

- %d got replaced by value of an integer variable (no),
- %c got replaced by value of a character variable (ch),
- %f got replaced by value of a float variable (flt),
- %lf got replaced by value of a double variable (dbl),
- %s got replaced by value of a string variable (str),
- %o got replaced by a octal value corresponding to integer variable (no),
- %x got replaced by a hexadecimal value corresponding to integer variable
- \n got replaced by a newline.

2. C scanf() function:

- scanf() function is used to read character, string, numeric data from keyboard
- Consider below example program where user enters a character. This value is assigned to the variable "ch" and then displayed.
- Then, user enters a string and this value is assigned to the variable "str" and then displayed.

Example program for printf() and scanf() functions in C:

```
#include <stdio.h>
int main()
{
char ch;
char str[100];
printf("Enter any character \n");
scanf("%c", &ch);
printf("Entered character is %c \n", ch);
printf("Enter any string ( upto 100 character ) \n");
scanf("%s", &str);
printf("Entered string is %s \n", str);
}
```

Output:

```
Enter any character
a
Entered character is a
Enter any string ( upto 100 character )
hai
Entered string is hai
```

- The format specifier %d is used in scanf() statement. So that, the value entered is received as an integer and %s for string.
- Ampersand is used before variable name "ch" in scanf() statement as &ch.