

Certificate - Software Development

Input Output Functions



Input and output Functions

- In C language to perform input and output operations there are built in function that comes with the C language, which are called standard library functions. Here we will be learning the printf() and the scanf() functions.
 - printf() function This is used to print a formatted on the screen including character, string, float, integer, octal and hexadecimal values
 - scanf() function This is used to read formatted input from the keyboard containing character, string and numeric data



printf() Function



Syntax:

printf("Control String", arg1, arg2, argN);

According to the syntax everything that is given in the control string is printed exactly as it is except for % signs (percentage directive) and \ signs (backslash directive) appearing within that.

- (%) Percentage directive is used to print data values
- (\) Backslash directive is used to control characters

printf() is defined in the header file **stdio.h** therefore must include the following statement when calling it from a program

include <stdio.h>



% Directive in printf()



% Directive is used to print data values

% Directive	Description
%d	argument is printed as a decimal
%х	argument is printed as a hexadecimal
%o	argument is printed as an octal value
%f	argument is printed as a fractional number
%с	argument is printed as a character
%s	argument is printed as a string
%%	This is used to print a percentage

\ Directive in printf()



\ Directive is used to print control characters

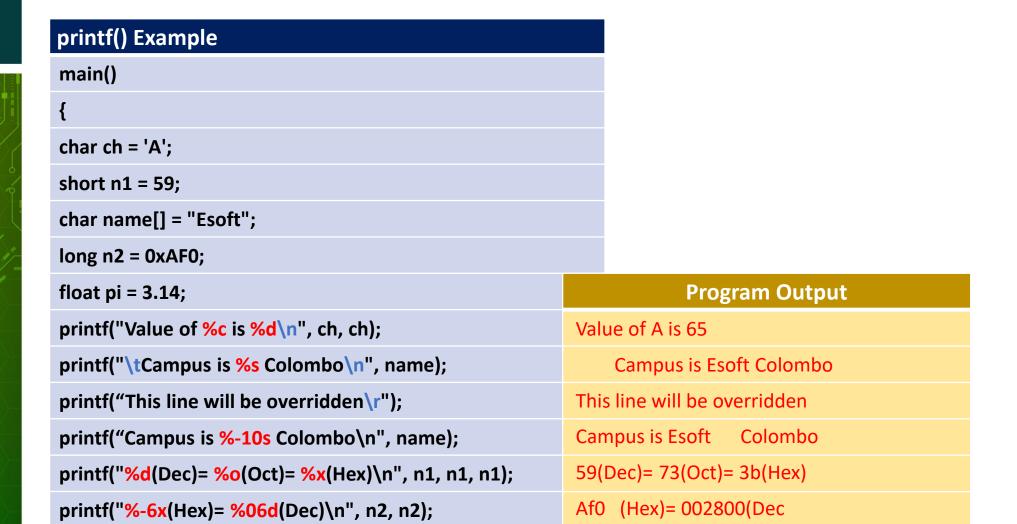
\ Directive	Description
\n	prints a "newline" character
\b	outputs a backspace character
\r	outputs a carriage return (without a line feed)
Υ	prints a single quote
\"	prints a double quote
//	prints a single backslash



Formatting with printf()

- Any integer data type can be printed using %c, %d, %o and %x
 - %Nd N indicates the size of the field (leading spaces filled with spaces)
 - %0Nd Same as above leading spaces filled with Zeros
 - %-Nd Number will be left aligned spaces are kept after the number
- %Ns will print a string using a field size of N, string will be right aligned with leading spaces.
- %-Ns print a string using a field size of N, string will be left aligned with trailing spaces.
- %N.Mf –N here is the total field size M is the number of decimal places





Value of pi = 3.140000

Value of pi = 003.1





printf("Value of pi = %f\n", pi);

printf("Value of pi = $\%05.1f\n$ ", pi);

scanf() Function



- Syntax: scanf("Control String", arg1, arg2, argN);
- This function is used to input data from the keyboard. Correct % directive must be used depending on the type of data.
- If the input data doesn't match the data format given, it will incorrectly read values.

```
Reading a Character from the Keyboard

char ch;

printf("Enter a Character : ");

scanf("%c", &ch);
```





- If the input data doesn't match the data format given, it will incorrectly read values.
- fflush(stdin); safer to use this to clear the input buffer, to prevent remaining buffer content incorrectly being read as the next input.

```
Reading a Float number from the Keyboard
float rate;
printf("Enter inerest rate : ");
                                                Reading a String from the Keyboard
scanf("%f", &rate);
                                                char name[30];
Reading a series of Integers
                                                printf("Enter your Name : ");
int d, m, y;
                                                scanf("%s", name);
printf("Enter your DOB (dd-mm-yy) : ");
scanf("%d-%d-%d", &d, &m, &y);
```



Sample Program

Following example demonstrates scanf(), printf() and the some of the operators. It calculates and displays the area and the perimeter of a circle when the radius is entered from the keyboard.

```
main()
      int radius;
      float area, peri;
                                                          Program Output
      const float pi = 3.14;
                                                 Enter radius: 5
      printf("Enter radius : ");
      scanf("%d", &radius);
                                                 Area = 78.50
      area = pi * radius * radius;
                                                 Perimeter = 31.40
      peri = 2 * pi * radius;
      printf("Area = %.2f\n", area);
      printf("Perimeter = %.2f\n",peri);
```



Lesson Summary

- Standard Library Functions
- printf() Function
- Percentage Directive
- Backslash Directive
- Formatting with printf()
- Sample program for printf()
- scanf() Function