Paper 102:Programming & Problem solving through C

Lecture-02:Unit-I

C Fundamentals

A.V.Hujon, Dept. of Computer Science, SAC

Standard output library function: printf()

The printf function does the following:

- Accept a format string followed by a series of arguments
- Apply to each argument, the corresponding format specifier contained in the format string
- Output the formatted data in the desired format

printf("control string",arg1,arg2…,argn);

Control string or format specifier contains format information

arg1,arg2,…,argn represents the individual output data items.

```
#include <stdio.h>
void main()
{       int a=3;
                a=a*a;
                printf("%d",a);
}
```

Format specifier/conversion character/Control string

Commonly Used Conversion Characters for Data Output

Conversion Character	*Meaning*
c	data item is displayed as a single character
d	data item is displayed as a signed decimal integer
e	data item is displayed as a floating-point value with an exponent
f	data item is displayed as a floating-point value without an exponent
g	data item is displayed as a floating-point value using either e-type or f-type conversion, depending on value; trailing zeros, trailing decimal point will not be displayed
i	data item is displayed as a signed decimal integer
o	data item is displayed as an octal integer, without a leading zero
s	data item is displayed as a string
u	data item is displayed as an unsigned decimal integer
x	data item is displayed as a hexadecimal integer, without the leading 0x

printf(“%d”,a);

printf(“Have a Good day!”);

printf(“The value of a= %d and the square of a=%d”,a,a*a);

Using minimum field width

1. It can be specified by preceding the conversion character by an unsigned integer.
2. If the number of characters in the corresponding data item is less than the specified field width, then the data item will be preceded by enough leading blanks.
3. If the number of characters in the corresponding data item exceeds the specified field width, then additional space will be allocated to the data item, so that the entire data item will be displayed.

```
#include <stdio.h>

main()          /* minimum field width specifications */

{
    int i = 12345;
    float x = 345.678;

    printf("%3d %5d %8d\n\n", i, i, i);
    printf("%3f %10f %13f\n\n", x, x, x);

}
```

Output

```
12345 12345     12345

345.678000 345.678000     345.678000
```

printf(): Precision

1. The maximum number of decimal places for a floating point value , or for characters in a string can be specified
2. A floating point number will be rounded if it must be shortened to conform to a precision specification

```
#include <stdio.h>

main()    /* displaying a floating-point number with
                          several different precisions */

{
    float x = 123.456;

    printf("%7f %7.3f %7.1f\n\n", x, x, x);

}
```

When the program is executed, the following output is generated:

```
123.456000 123.456    123.5
```

Example

```
#include<stdio.h>
void main()
{
    float f_var=10.12576893;
    int wid_prec;
    printf("output 1: %f\n",f_var);
    printf("output 2:%20f\n",f_var);
    printf("output 3:%-20f\n", f_var);
    printf("output 4:%+f\n", f_var);
    printf("output 6:%.5f\n", f_var);
    scanf("%i",&wid_prec);
    printf("output 5:%20.*f\n",wid_prec, f_var);
    printf("output 5:%-+20.5f\n",f_var);
}
```

Class room: Assignment

1. Write a C program to calculate the area of a circle, where the radius is given as 3, and print the result on the screen.
2. Write a C program to store two integer numbers (say 2 and 5), and then interchange their memory location without using a temporary variable.
3. Wap to calculate the Net salary for employees, where the basic is given and allowance and deductions are calculated as given below, finally display the net salary.

   DA is 45% of Basic pay

   HRA is 30% of Basic pay

   PF is 8% of Basic pay