C Language

Chapter # 10

Input and Output

Lecture: 19

Today's Lecture

- Field Width Specifier

Field Width Specifier

- The number of columns used to display a value on the screen is called field width.
- A field width specifier describes the number of columns that should be used to print a value. It determines how the value will be displayed on the screen.

Syntax:

flag width.precision

Example:

%-4.2f

- Some values of flag are as follows.

Flag	Description
-	The output will be left-justified
+	Always display sign with value
space	Display space if there is no sign

- **Width**: It specifies total number of columns used to display value.
- **Precision**: It indicates number of columns used after decimal point.

Specifying Field Width

- Field width specifier is used to specify number of columns in which the value is printed. It includes a positive value after % symbol that indicates the field width.

  Some examples of field width are as follows.

  - %6d specifies an integer for a field of width 6.
  - %10c specifies a character for a field of width 10.
  - %8f specifies a floating point value for a field of width 8.

If the specified field width is not enough to print the value, the additional space is automatically used.

If the value is less than the specified width in the format specifier, the value is printed right justified in the field.

Specifying Field Width for Integers

- The %d format specifier is used to display integer value in printf function.
- A value can be written between % and d. The value specifies the field-width or the number of columns to be used for displaying the value.

For example:

The following statement indicates that 4 columns will be used to display the value of area.

printf("Area = %4d", area);

Suppose the value of area is 27. Two spaces will be added before 27 as follows.

Area = _ _ 2 7

The value will appear right justified and two spaces will appear before the actual value.

Specifying Left or Right Justified Output

- The symbol – is used with % sign to display the output left justified.

  The statement printf("Area = %-4d", area);

  Will display the value of area left justified in 4 columns space. If the value of area is 27, it will display as follows.

  Area = 2 7 _ _

  Some Examples: How Integer values are displayed.

Value	Format Specifier	Output	Value	Format Specifier	Output
786	%4d	_786	-786	%4d	-786
786	%5d	_ _786	-786	%5d	_ -786
786	%6d	_ _ _786	-786	%6d	_ _ -786
786	%1d	786	-786	%2d	-786

Specifying Width & Precision for Floating Point Values

- The format specifier %f is used to display floating point values in printf function.
- A value can be written between % and f.
- A zero is also printed before decimal point for a number that is smaller than zero. For example, if the value is .5, it will appear as 0.5.
- The total field width should include a space for decimal point and for minus sign if the number is negative.

For example:

The following statement indicates that 8 columns will be used to display the value of n, from which the space of two columns is used for the digits after decimal point.

printf("%8.2f", n);

Suppose the value of n is 20.344. The value of n will be rounded off to two decimal places. Three spaces will be added before 20.34 as follows.

_ _ _ 20.34

The value will appear right justified and three spaces will appear before the actual value.

Specifying Width & Precision for Floating Point Values

If the value of n is 20.346

The value of n will be rounded off to two decimal places. The second digit of fractional part is increased by 1 if the third digit of fractional part is 5 or more. Otherwise the third digit is discarded.

For example:

The following statement indicates that 8 columns will be used to display the value of n, from which the space of two columns is used for the digits after decimal point.

printf("%8.2f", n);

Suppose the value of n is 20.346. Three spaces will be added before 20.35 as follows.

_ _ _ 20.35

The value will appear right justified and three spaces will appear before the actual value.

Specifying Width & Precision for Floating Point Values

Some Examples: How Integer values are displayed.

Value	Format Specifier	Output	Value	Format Specifier	Output
-25.41	%6.2f	-25.41	.123	%6.2f	_ _0.12
3.14159	%5.2f	_3.14	3.14159	%4.2f	3.14
3.14159	%3.2f	3.14	3.14159	%5.1f	_ _3.1
3.14159	%5.3f	3.142	3.14159	%8.5f	_3.14159
.6789	%4.2f	0.69	-0.007	%4.2f	-0.01
-.007	%8.3f	_ _-0.007	-0.007	%8.5f	-0.00700
-.007	%.3f	-0.007	-3.14159	%.4f	-3.1416

Example 10.4

Write a program that displays average marks using field width 5 characters and precision of 2 characters.

```
#include<stdio.h>
#include<conio.h>
main()
{
    float avg = 70.52;
    printf("Average marks are: %5.2f", avg);
}
```

Output:

Average marks are: 70.52

Example 10.5

Write a program that display floating point value 152.3333 using field width of 10 characters and precision of 3 characters justified to left side.

```
#include<stdio.h>
#include<conio.h>
main()
{
    float v = 152.3333;
    printf("Value is: %-10.3f", v);
}
```

Output:

Value is: 152.333_ _ _

Example 10.8

Write a program that displays the name of a person right justified and address left justified by using 25 characters space for each.

```
#include<stdio.h>
#include<conio.h>
main()
{
    char name[ ] = “Usman”;
    char address[ ] = “Faisalabad”;
    printf(“%25s", name);
    printf(“%-25s", address);
}
```

Output:

_ _Usman

Faisalabad_ _

The End

Read this topic from your books and ask question if any confusion.

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