



Tutorial Link <https://codequotient.com/tutorials/C - Precedence and Associativity of operators/5a1d9c1252795c1b16c0ac26>

## TUTORIAL

# C - Precedence and Associativity of operators

## Chapter

### 1. C - Precedence and Associativity of operators

If there are more than one operators in a single expression, then a ordering must be done between these operators, for which will execute in which sequence. There are two rules specified known as operator precedence and operator associativity.

When the operators are of different type the precedence will lead the ordering between operators.

But When the operators are of same type the associativity will lead the ordering between operators.

Following is the precedence and associativity rules in C languages:

<u>Precedence</u>	<u>Operators</u>	<u>Associativity</u>
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Highest	( ) [ ] . →	
Left to right	(Parentheses etc.)	
	! ~ ++ -- sizeof + - * & (type)	
Right to left	(Unary operators)	
	* / %	
Left to right	(Arithmetic)	
	+ -	
Left to right	(Arithmetic)	
	>> <<	
Left to right	(Bitwise Shift)	
	< <= > >=	

```

Left to right  (Relational)
    == !=
Left to right  (Relational)
    &
Left to right  (Bitwise AND)
    ^
Left to right  (Bitwise XOR)
    |
Left to right  (Bitwise OR)
    &&
Left to right  (Logical AND)
    ||
Left to right  (Logical OR)
    ?:
Right to left  (Conditional)
    = += -= *= /= %= &= ^= |= >>=
Right to left  (Assignment)
Lowest        ,
Left to right  (Comma)

```

```

1  #include <stdio.h>
2
3  int main()
4  {
5      int a,b,c,d;
6      a = 15;
7      b = 2;
8      c = 5;
9      d = 8;
10
11     printf("a=%d b=%d c=%d d=%d \n\n",a,b,c,d);
12
13     printf("a * b - c = %d \n", a * b - c);
14     printf("a - b * c = %d \n", a - b * c);
15
16     return 0;
17 }
18

```

C does not specify the order in which the subexpressions of an expression are evaluated. This leaves the compiler free to rearrange

an expression to produce more optimal code. However, it also means that your code should never rely upon the order in which subexpressions are evaluated. For example, the expression

```
x = f1() + f2();
```

does not ensure that `f1()` will be called before `f2()`. `f1()` may be evaluated before `f2()` or vice versa; thus if either `f1()` or `f2()` alters a variable on which the other depends, `x` can depend on the order of evaluation.

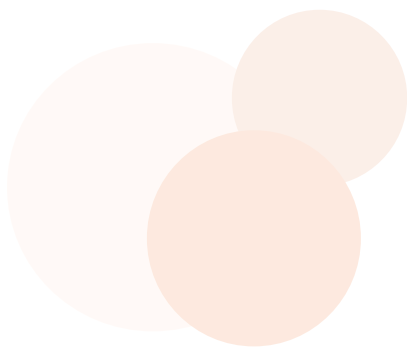
Similarly, the order in which function arguments are evaluated is not specified, so the statement

```
printf("%d %d\n", ++n, power(2, n));
```

can produce different results with different compilers, depending on whether `n` is incremented before `power` is called. The solution, of course, is to write

```
++n;  
printf("%d %d\n", n, power(2, n));
```

According to Dennis Ritchie - "The moral is that writing code that depends on order of evaluation is a bad programming practice in any language. Naturally, it is necessary to know what things to avoid, but if you don't know how they are done on various machines, you won't be tempted to take advantage of a particular implementation".



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