

Operators And Expression:
Precedence And Associativity Of
Operators

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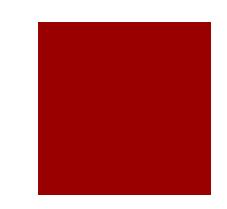
## Precedence And Associativity Of Operators

## Precedence of operators

- If more than one operators are involved in an expression then, C has predefined rule of priority of operators. This rule of priority of operators is called operator precedence.
- In C, precedence of arithmetic operators (\*,%,/,+,-) is higher than relational operators (==,!=,>,<,>=,<=) and precedence of relational operator is higher than logical operators (&&, | | and !). Suppose an expression:

```
(a>b+c&&d)
This expression is equivalent to:
  ((a>(b+c))&&d)
  i.e, (b+c) executes first
  then, (a>(b+c)) executes
  then, (a>(b+c))&&d) executes
```

## Precedence And Associativity Of Operators



## Associativity of operators

Associativity indicates in which order two operators of same precedence (priority) executes. Let us suppose an expression:

Here, operators == and != have same precedence. The associativity of both == and != is left to right, i.e., the expression in left is executed first and execution take pale towards right. Thus, a==b!=c equivalent to:

The expression a=b=c is parsed as a=(b=c), and not as (a=b)=c because of right-to-left associativity.

Precedence	Operator	Description	Associativity
1	()	Function call	Left-to-Right
	[]	Array subscripting	
	*	Structure and union member access	
	->	Structure and union member access through pointer	
2	++	Prefix increment and decrement	Right-to-left
	+ -	Unary plus and minus	
	1 ~	Logical NOT and bitwise NOT	
	(type)	Type cast	
	*	Indirection (dereference)	
	&	Address-of	
	sizeof	Size-of	
3	* / %	Multiplication, division, and remainder	Left-to-right
4	+-	Addition and subtraction	
5	<< >>	Bitwise left shift and right shift	
6	< <=	For relational operators < and ≤ respectively	
	> >=	For relational operators > and ≥ respectively	
7	!-	For relational = and ≠ respectively	
8	&	Bitwise AND	
9	^	Bitwise XOR (exclusive or)	
10	1	Bitwise OR (inclusive or)	
11	8.8	Logical AND	
12	11	Logical OR	
13	?:	Ternary conditional	Right-to-Left
14		Simple assignment	
	+= -=	Assignment by sum and difference	
	*= /= %=	Assignment by product, quotient, and remainder	
	<<=>>=	Assignment by bitwise left shift and right shift	
	&= ^=  =	Assignment by bitwise AND, XOR, and OR	83
15	,	Comma	Left-to-right

The following table lists the precedence and associativity of C operators.

Operators are listed top to bottom, in descending precedence.