C and C++ Operator Precedence and Associativity

This table lists the C and C++ language operators in order of precedence and shows the direction of associativity for each operator. Operators that exist only in C++ are shown in red. Operators that appear in the same group have the same precedence.

Operator precedence determines which operator will be performed first in a group of operators with different precedences. For instance 5 + 3 * 2 is calculated as 5 + (3 * 2), giving 11, and not as (5 + 3) * 2, giving 16.

The operator associativity rules define the order in which adjacent operators **with the same precedence level** are evaluated. For instance the expression 8 - 3 - 2 is calculated as (8 - 3) - 2, giving 3, and and not as 8 - (3 - 2), giving 7. In this case we say that subtraction is left associative meaning that the left most subtraction must be done first.

Operator Name	Associativity	Operators
Primary scope resolution	left to right	`::`
Primary	left to right	`() [ ] . -> dynamic_cast typeid`
Unary	right to left	`++ -- + - ! ~ & * (type_name) sizeof new delete`
C++ Pointer to Member	left to right	`.*->*`
Multiplicative	left to right	`* / %`
Additive	left to right	`+ -`
Bitwise Shift	left to right	`<< >>`
Relational	left to right	`< > <= >=`
Equality	left to right	`== !=`
Bitwise AND	left to right	`&`
Bitwise Exclusive OR	left to right	`^`
Bitwise Inclusive OR	left to right	`|`
Logical AND	left to right	`&&`
Logical OR	left to right	`||`
Conditional	right to left	`? :`
Assignment	right to left	`= += -= *= /= <<= >>= %= &= ^= |=`
Comma	left to right	`,`