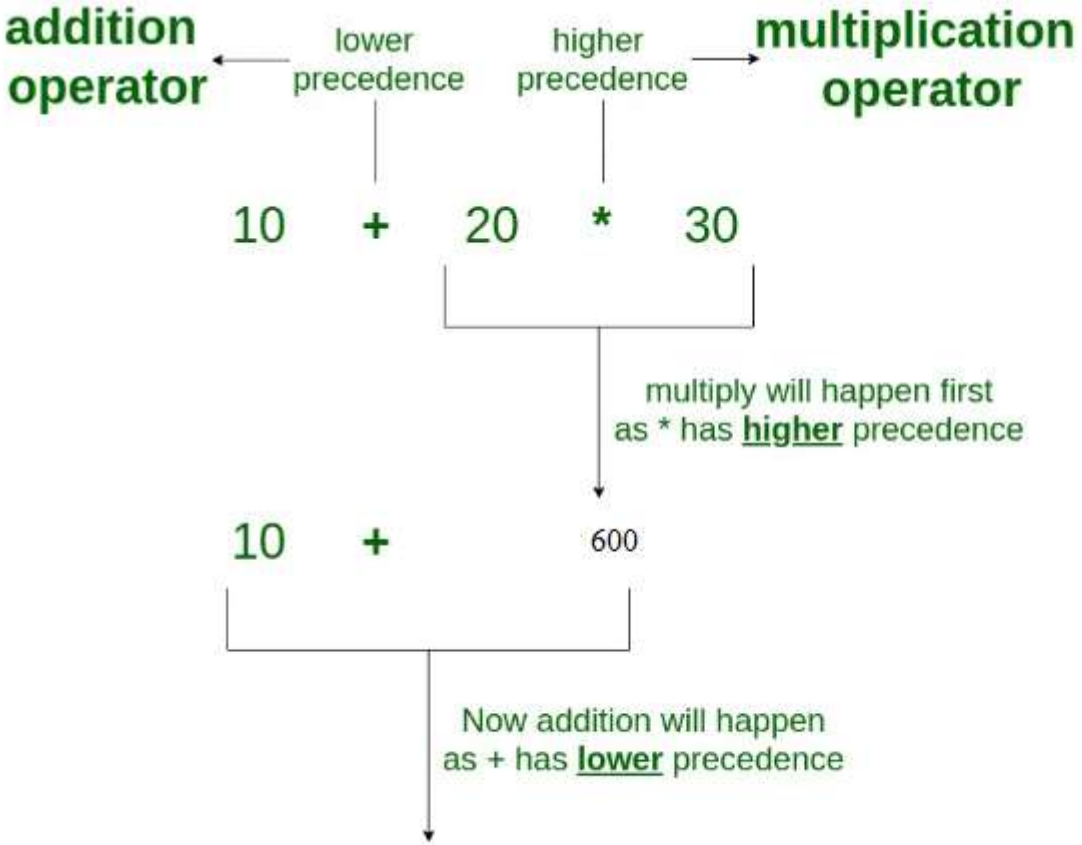
Operator Precedence and Associativity in C

Operator Precedence

- **Operator precedence** determines which operator is performed first in an expression with more than one operators with different precedence.

For example: Solve

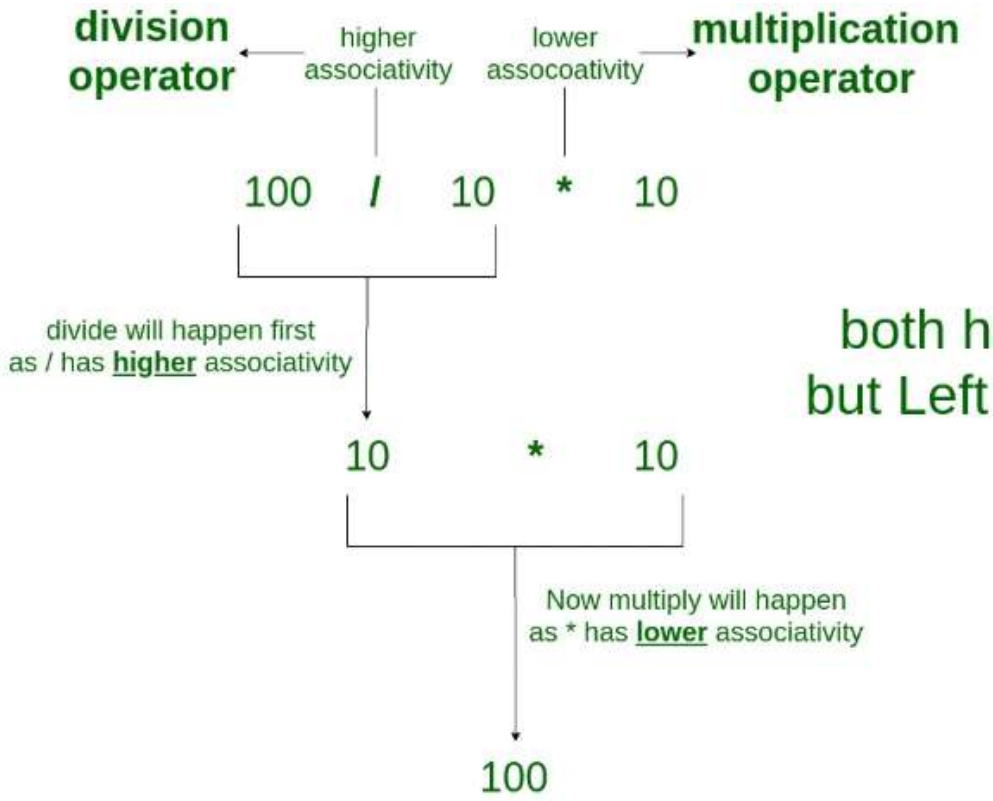
10 + 20 * 30



10 + 20 * 30 is calculated as **10 + (20 * 30)** and not as **(10 + 20) * 30**

Operators Associativity

- **Operators Associativity** is used when two operators of same precedence appear in an expression. Associativity can be either **L**eft **t**o **R**ight or **R**ight **t**o **L**eft.
- **For example:** '*' and '/' have same precedence and their associativity is **L**eft **t**o **R**ight, so the expression "100 / 10 * 10" is treated as "(100 / 10) * 10".



/ and *****
both have the same precedence
but Left to Right (**LTR**) associativity

Operators Precedence and Associativity are two characteristics of operators that determine the evaluation order of sub-expressions in absence of brackets

Example

Solve

3 * 8 / 4 % 4 * 5

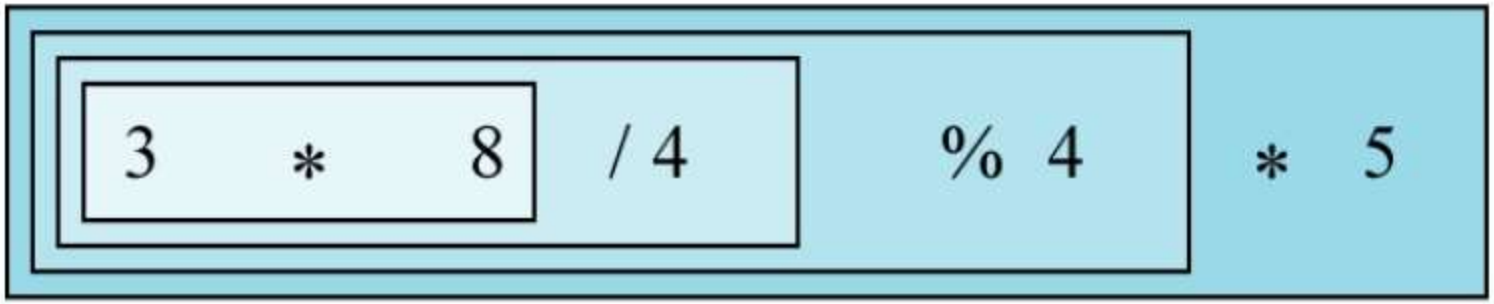
Highest Precedence

Precedence and Associativity

OPERATOR	TYPE	ASSOCIAVITY
( ) [ ] . ->		left-to-right
++ -- + - ! ~ (*type*) * & sizeof	Unary Operator	right-to-left
* / %	Arithmetic Operator	left-to-right
+ -	Arithmetic Operator	left-to-right
<< >>	Shift Operator	left-to-right
< <= > >=	Relational Operator	left-to-right
== !=	Relational Operator	left-to-right
&	Bitwise AND Operator	left-to-right
^	Bitwise EX-OR Operator	left-to-right
|	Bitwise OR Operator	left-to-right
&&	Logical AND Operator	left-to-right
||	Logical OR Operator	left-to-right
? :	Ternary Conditional Operator	right-to-left
= += -= *= /= %= &= ^= |= <<= >>=	Assignment Operator	right-to-left
,	Comma	left-to-right

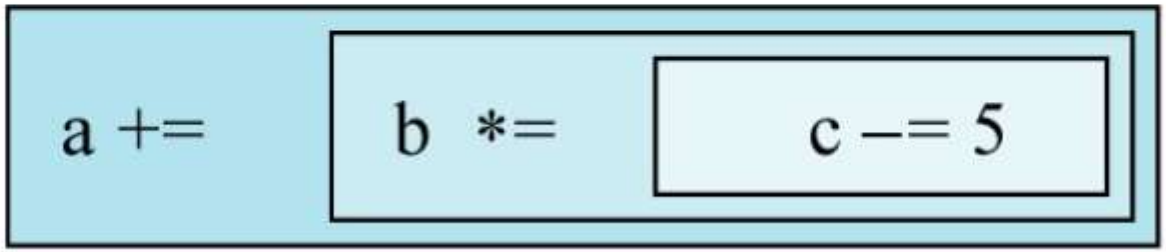
Left Associativity

3 * 8 / 4 % 4 * 5



Right Associativity

a += b *= c-=5



Examples

Solve

10 – 3 % 8 + 6 / 4

17 – 8/4 *2 + 3 - ++5