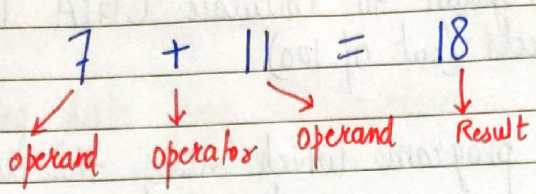
Chapter 2 - operators and Expressions

Operators are used to perform operations on variables and values.



Types of operators

- → Arithmetic operators → +, -, *, /, %, ++, --
- → Assignment operators → =, +=
- → Comparison operators → ==, >=, <=
- → Logical operators → &&, ||, !
- → Bitwise Operators → &, | (operates bitwise)

Arithmetic operators cannot work with booleans
% operator also can work on floats & doubles

Precedence of operators

The operators are applied and evaluated based on precedence. For example (+, -) has less precedence compared to (*, /). Hence * & / are evaluated first.
In case we like to change this order, we use parenthesis

Associativity

Associativity tells the direction of execution of operators
It can either be Left to Right or Right to left

- * / → L to R
- + - → L to R
- ++, = → R to L

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Quick Quiz: How will you write the following expressions in Java?

$\frac{x-y}{2}$, $\frac{b^2-4ac}{2a}$, v^2-u^2, $a*b-d$

Resulting data type after arithmetic operation
following table summarizes the resulting data types after arithmetic operation on them

```
R = b + 5 → int
R = 5 + i → int
R = l + f → float
R = i + f → float
R = c + i → int
R = c + 5 → int
R = l + d → double
R = f + d → double
```

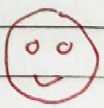
b → byte f → float
s → short d → double
i → integer c → character
l → long

Increment and Decrement operators
a++ , ++a → Increment operators → Data type
a-- , --a → Decrement operators → remains same

These will operate on all data types except booleans

Quick Quiz: Try increment and decrement operators on a Java variable

a++ → first use the value and then increment
++a → first increment the value then use it



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Quick Quiz: What will be the value of the following expression (x).

```
int y = 7;
int x = ++y * 8;
```

Value of x?

```
Char a = 'B';
a++;
```

→ a is now 'C'