C++ Programming

Binary and Unary Operators

Mostafa S. Ibrahim
Teaching, Training and Coaching since more than a decade!

Artificial Intelligence & Computer Vision Researcher
PhD from Simon Fraser University - Canada
Bachelor / Msc from Cairo University - Egypt
Ex-(Software Engineer / ICPC World Finalist)

Arithmetic Operators

```
4  int main() {
5      int x = 6, y = 3;
6
7      cout << x + y << "\n";           // 9
8      cout << x + 2 * y - 1 << "\n";   // 11
9      cout << x / y << "\n";           // 2
10
11     int z1 = (x + y) / 3 / 3;        // 1
12     cout << z1 << "\n";
13
14     return 0;
15 }
```

- Arithmetic: traditional operations (e.g. addition) on numbers
- Operator: Symbol
  - Arithmetic Operators: + - * / %
- x + 2 * y - 1
  - We call it **expression**
  - + * - are **operators**
  - x, 2, y, 1 are **operands**
- () : Parentheses for order for operations
- They are **binary** operators
  - Needs **two** operands: 3 + 5

- and ! operators

```
4  int main() {
5      int x = 6;
6      int y = -x; // -6
7
8      bool male = true;
9      bool female = !male; // False
10
11     // 1 0
12     cout << (!0) <<" "<<(!1);
13
14     return 0;
```

- -x just change the sign
  - 6 ⇒ -6 -6 ⇒ 6
- !x (not x): Switch bool
  - True ⇒ False False ⇒ True
  - 1 ⇒ 0 0 ⇒ 1
  - It is part of: **logical operators**
    - Logic = kind of boolean
    - Called Logical not / negation operator
- How many operands? Just one
  - Named a **unary** operator

"Acquire knowledge and impart it to the people."

"Seek knowledge from the Cradle to the Grave."