

Operators In C language

Day-6

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Arithmetic Instruction

An instruction which is used to manipulate data using operators, is known as arithmetic instruction.

$3 + 4$ ← ← Operands / data
↑ Operator

$3 + 4 * 5$

- ① Unary operators
- ② Binary Operators
- ③ Ternary Operator

23 35 40 24 60
✓ X X X X

Operators

- ① Unary operators
- ② Arithmetic Operators
- ③ Bitwise Operators
- ④ Relational Operators
- ⑤ Logical Operators
- ⑥ Conditional Operators
- ⑦ Assignment Operators.

Unary Operators

+ , - , ++ , -- , `sizeof()`

`int x = 5;`

$\begin{matrix} x \\ \boxed{7} \end{matrix}$

`printf("%d", x); 5`

$x++;$ → post increment ↓

`printf("%d", x); 6`

$++x;$ → pre increment ↑

`printf("%d", x); 7`

↓ $x--;$ post decrement

↑ $--x;$ pre decrement

$x = x - 1$

main() x $\begin{matrix} 6 \\ \boxed{5} \end{matrix}$ y $\begin{matrix} 5 \\ \boxed{5} \end{matrix}$

`int x=5, y;`

`y=x++;`

`printf("%d%d", x, y);`

$\begin{matrix} 6 \\ 5 \end{matrix}$

`double y;`

`x=sizeof(y);`

$\begin{matrix} 5 \\ 5 \end{matrix}$ ↗

$\begin{matrix} 8 \\ \boxed{8} \end{matrix}$

$\begin{matrix} 5 \\ 6 \end{matrix}$ ↗

`sizeof(g)`

$\begin{matrix} 6 \\ 6 \end{matrix}$ ↗

$\begin{matrix} 6 \\ 5 \end{matrix}$ ↗

H.W

- ① Data type
- ② variable
- ③ constant

Arithmetic Operators (L to R)

* / %

a * b / c *

+ -

a / b * c /

$3+4 \Rightarrow 7$

a + b * c *

$3-4 \Rightarrow -1$

35 % 6 5

$3*4 \Rightarrow 12$

2.5 % 3 error

$3/4 \Rightarrow 0$

2 % 0.5 2

$3.0/4 \Rightarrow 0.75$

$3/4.0 \Rightarrow 0.75$

$\sqrt{2} (0)$

$3.0/4.0 \Rightarrow 0.75$

Bitwise Operators

$\&$ $|$ \wedge \sim $>>$ $<<$

$$0 \& 0 \rightarrow 0$$

$$0 \& 1 \rightarrow 0$$

$$1 \& 0 \rightarrow 0$$

$$1 \& 1 \rightarrow 1$$

$$0 | 0 \rightarrow 0$$

$$0 | 1 \rightarrow 1$$

$$1 | 0 \rightarrow 1$$

$$1 | 1 \rightarrow 1$$

$$0 \wedge 0 \rightarrow 0$$

$$0 \wedge 1 \rightarrow 0$$

$$1 \wedge 0 \rightarrow 0$$

$$1 \wedge 1 \rightarrow 1$$

$$\sim 0 \rightarrow 1$$

$$\sim 1 \rightarrow 0$$

000000000000000000000000000000110101010

int x;

x = 47 & 29;

$2^7 \ 2^6 \ 2^5 \ 2^4 \ 2^3 \ 2^2 \ 2^1 \ 2^0$

128 64 32 16 8 4 2 1

47 = 0 0 1 0 1 1 1 1

29 = 0 0 0 1 1 1 0 1

13 = 0 0 0 0 1 1 0 1

x = 106 \gg 2;



11010 = 26

Relational Operators

< > <= >= == !=

True = 1
False = 0

3 < 4 1

5 >= 5 1

2 == 3 0

5 > 4 > 3 0

Logical Operators

! NOT (unary)

&& AND

|| OR

$$!T \Rightarrow F$$

$$!F \Rightarrow T$$

$$T \& T \Rightarrow T$$

$$T \& F \Rightarrow F$$

$$F \& x \Rightarrow F$$

$$F || F \Rightarrow F$$

$$F || T \Rightarrow T$$

$$T || x \Rightarrow T$$

$$x = 5 > 4 \quad | \quad x > 2 \& x < 5$$

$$x = !(5 > 4) \quad 0$$

Assignment Operators

=

+ = - = *= /= % =

x = 4;

4 = x; ~~x~~

Variable = ?

int x = 5;

x += 2; x = x + 2

x *= 3; x = x * 3

x %= 4; x = x % 4

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