

Python, C, → C++

#include < > → Postream

Higher level

Assembly

lower level

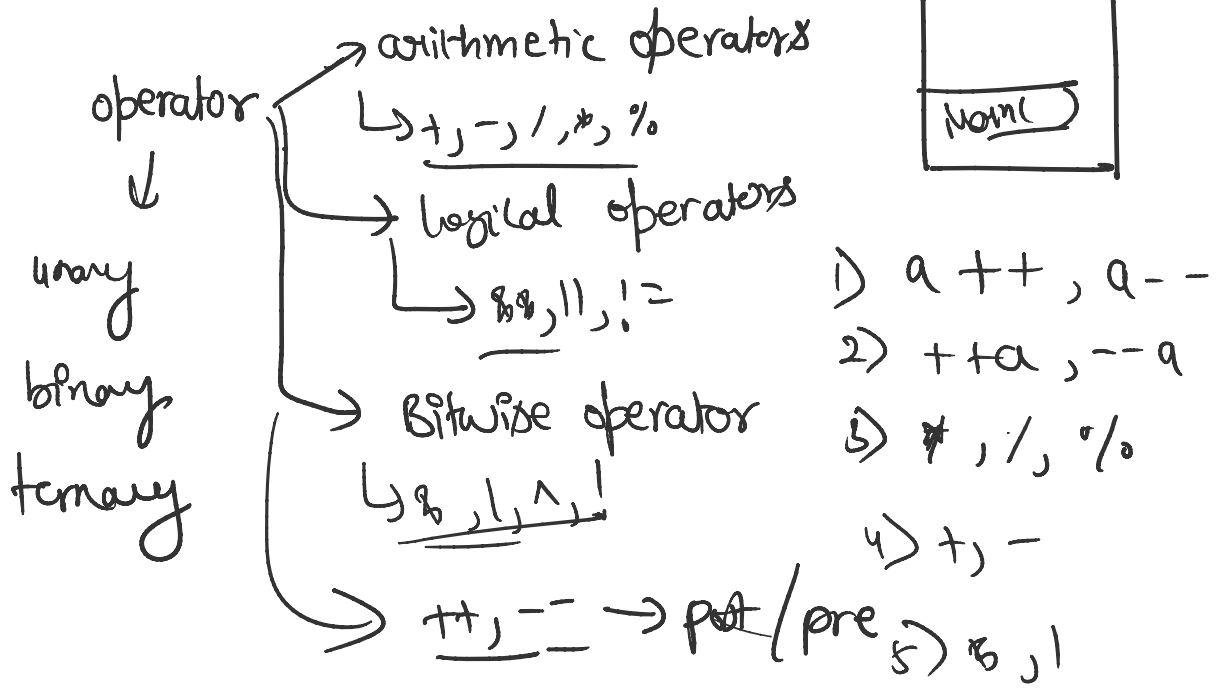
```
int main() {
    int x;
    scanf("%d", &x); // c
    cin >> x;
```

bits 0 1 0

101011

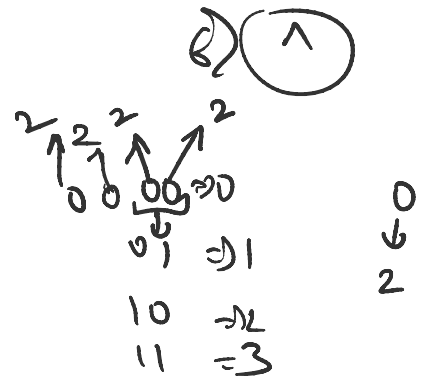
| |

$\hookrightarrow cin \gg x;$
 y



$$(a^nb)^*c$$

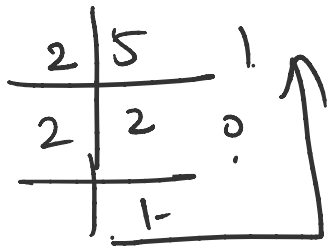
$$a^nb^*c$$



Bitwise: $\&, |, !, ^$

char \rightarrow 1 byte \rightarrow 8 bit \rightarrow $\frac{10010000}{2^8}$

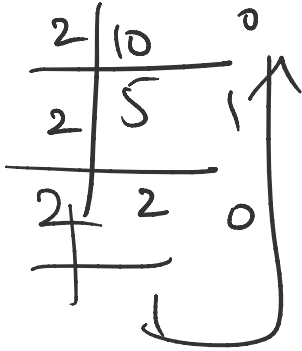
int \rightarrow 4 bytes \rightarrow 32 bits \rightarrow $\frac{2^{32}}{2^{31} - 1}$



000000000000 101

$$\begin{array}{r} 3+2 \\ 10 \quad 10 \\ \hline 2 \quad 1 \quad 0 \end{array} \Rightarrow 6+1=10$$

1010 \rightarrow 10



1 11 101
10 100

\rightarrow logic gate \Rightarrow A B \rightarrow 0

5 & 8 $\Rightarrow (101)_2 \& (1000)_2$

21 & 7 $\Rightarrow (10101)_2 \& (111)_2$

$$\begin{array}{r} 000000 / 100000 \\ 0000 \quad 0100 \\ \hline 0000 \\ 101011 \\ 001111 \\ \hline 001011 \end{array}$$

$$\begin{array}{r} 2^3 \quad 2^2 \quad 2^1 \quad 2^0 \\ 10111 \\ 43210 \end{array}$$

$(6+4+2+1) \Rightarrow 23$

$$\begin{array}{r} 21 \\ 7 \quad 101011 \\ 001111 \\ \hline 100100 \\ 2+2 \Rightarrow 6+2=8 \end{array}$$

21 Δ 7

\leq \geq $!$ $=$

$a+b \rightarrow \underline{a+b} \rightarrow a = \underline{a+b} \quad a+b = b$

$$a + b \rightarrow \begin{array}{l} + = \\ - = \\ / = \\ * = \end{array} \rightarrow \ddot{a} = \underline{a + b} \quad a + \underline{b}$$

$$\underline{x + + + y}$$

$$\underline{x + +} + y$$