Data types

int → 4 bytes

- → 0/1

1 byte = 8 bits

int ⇒ 2^{32} different numbers

-2^{31} to $2^{31}-1$

- 2147483648 to 2147483647

$2^{10} = 1024 \approx 1000 \Rightarrow 10^3$

$2^{30} = 2^{10} \times 2^{10} \times 2^{10}$

$\Rightarrow 10^3 \times 10^3 \times 10^3 \Rightarrow 10^9$

long ⇒ 8 byte ⇒ 64 bits ⇒ 2^{64}

-2^{63} to $2^{63}-1$

$(2^{10})^6 \times 2^3$

$(10^3)^6 \times 2^3 \Rightarrow 10^{18} \times 8$

Char → 1 byte ⇒ 2^8 ⇒ 256

0 - 255

ASCII ⇒ American Standard Codes for Information Interchange

0 → 48

A → 65

a → 97

Operators

1) Arithmatic
2) Relational
3) Logical
4) bitwise
5) Assignment
6) Ternary

Arithmatic

- Unary — 1 operand
  - Increment ++
  - decrement --
- Binary — 2 operand — + - * / %

a = 10

a++ ++a

a-- --a

c = a++ ;

a = ~~10~~ ~~++~~ ~~12~~ 13	~~10~~ ~~11~~ 12
b = ~~12~~ 11	12
c = ~~15~~ 14	15

int d = a++ + ++a + c-- - --b ++ a

10 + 12 + 15 - 11 - 13

12 + 12 + 15 - 11 - 11

Relational Operator

a > b
a < b
a >= b
a <= b
a == b equals
a != b not equals

⇒ return boolean value

Logical Operators

&& And
|| Or
! not

a > b && a > 10

a = 3
b = 0

a || b → true

bool a = true
b = !a

And

F F F
T F F
F T F
T T T

OR

F F F
T F T
F T T
F F T

Bit wise operator

Operates on bits

Assignment Operators

= put value from right to variable on left

a += 10 → a = a+10;

-=

*=

/=

Ternary Operator (? :)


```
int a = 10;
int b = a > 10 ? 5 : 15;
```