

# Variable, data types, & operators.

## ① Operators

arithmetic operators      logical operators [X]

[+, -, \*, /, %]  
↓  
modulo

[++, --]

$$3/2 = 1.5 \\ \downarrow \\ = 1$$

$$5 \\ \downarrow \\ 0$$

[javac Test.java]

(compilation error)      ↓  
[Syntax error]

.class (bytecode)

Java test.java

↓  
error

(runtime error)

errors

compilation errors

(syntax error)

[;, {, }]

↓  
bytecode

[javac]

runtime errors

(a/0);

runtime error.

test.txt

("C:\downloads\geogebra\test.txt");

file not found error  
(runtime error)

```
public static void main(String[] args) {  
    System.out.println("2+3"); // 2+3  
    System.out.println(2+3); // 5  
    System.out.println(2-3); // -1  
    System.out.println(2*3); // 6  
    System.out.println(3/2); // 1 (java takes only floor value while div)  
    //System.out.println(3/0); // runtime error  
    System.out.println(2/3);  
    System.out.println(3.0/2); // 1.5  
    /* Enter your code here. Read input from STDIN. Print output to STDOUT */  
}
```

modulo

$(a > b)$

$(a > b)$

$(a < b)$

$1 \rightarrow \text{quotient}$

$5 \% 2 = (\text{remainder})$

$1$

$5 \% 2 = 1$

$5 \% 5 = 0$

$2 \% 5 = 2$

$3 \% 6 = 3$

$1 \% 6 = 1$

$2 \% 6 = 2$

$3 \% 6 = 3$

$4 \% 6 = 4$

$5 \% 6 = 5$

$6 \% 6 = 0$

$(a = b)$

$a < b$

get last digit from this #

$5632$

$5632 \% 100 = 32$

$1 \% 5632 = 1$

Imp  $*$  when we do arithmetic op<sup>n</sup> over decimal value you will get decimal output.

$$5.0 + 1 = 6.0$$

$$5.0 - 1 = 4.0$$

$$5.0 \times 2 = 10.0$$

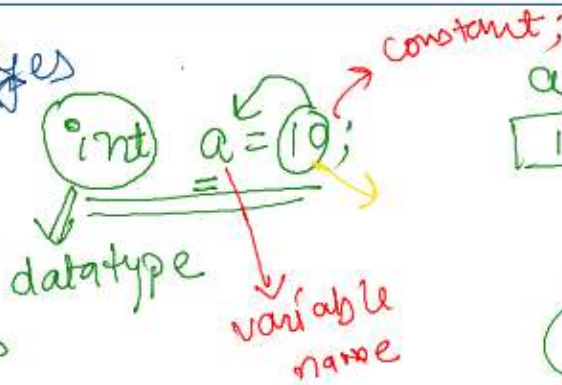
$$5.0 / 2 = 2.5$$

# Variables and data types

provided by java default

- [byte → 0 ✓
- short → 0 ✓
- ✓ int → 0 ✓
- ✓ long → 0 ✓
- float → 0.0 ✓
- ✓ double → 0.0 ✓
- ✓ boolean → T/F
- ✓ char → 'a', 'b' ...

1 byte  
2 byte  
4 bytes  
8 bytes  
4 byte  
8 byte  
no size // false  
1 byte



a  
10

1 byte = 8 bits

2<sup>8</sup>

0-

int 32 2 ≈ 10<sup>9</sup>

$$\Rightarrow 2^{30} \times 2^2$$

$$\Rightarrow \frac{2^{30}}{2^{30}} \Rightarrow (2^{10})^3$$

$$\Rightarrow (1024)^3$$

$$\approx (1000)^3$$

$$= (10^3)^3 = 10^9$$

int a;

byte a = 10; ✓  
short b = 23; ✓  
int c = -10; ✓  
long d = 283456; ✓  
float e = 10.3f; ✓  
double f = 10.0; ✓  
boolean g = true/false; ✓  
char ch = 'a';

Scanner scn = new Scanner(System.in);

```
public class Solution {
```

(40) 50

```
    public static void main(String[] args) {
```

```
        Scanner scn = new Scanner(System.in); // creating object of scanner
```

```
        ↳ int x = scn.nextInt();
```

x  
40

```
        ↳ int y = scn.nextInt();
```

y  
50

```
        ↳ int sum = x+y;
```

sum  
90

→ 90

```
        ↳ System.out.println(sum);
```

```
        ↳ int diff = x-y;
```

diff  
-10

= -10

```
        ↳ System.out.println(diff);
```

```
        ↳
```

```
    }
```

```
}
```

```
public class Solution {
```

```
    public static void main(String[] args) {
        Scanner scn = new Scanner(System.in);
```

a  
1234

b  
5678

$1234 / 10 = 4$

$5678 / 10 = 8$

```
        int a = scn.nextInt();
```

```
        int b = scn.nextInt();
```

last a  
4

last b  
8

```
        int lasta = a%10;
```

```
        int lastb = b%10;
```

```
        int ans = lasta+lastb;
```

```
        System.out.println(ans);
```

12

ans  
12

/\*Enter your code here. Read input from STDIN. Print output to STDOUT. Your class should be named Solution\*/