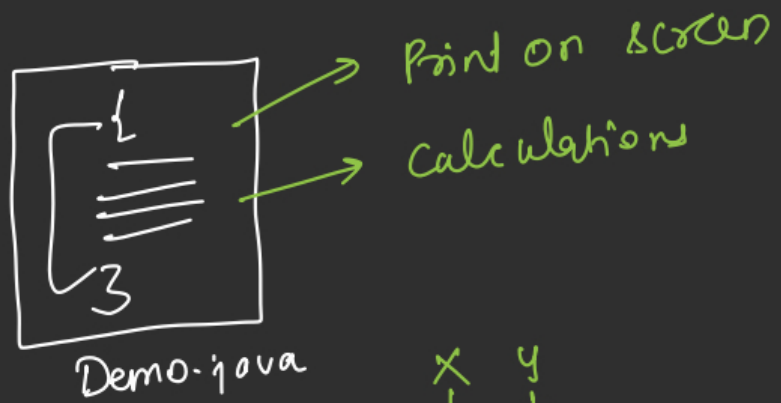
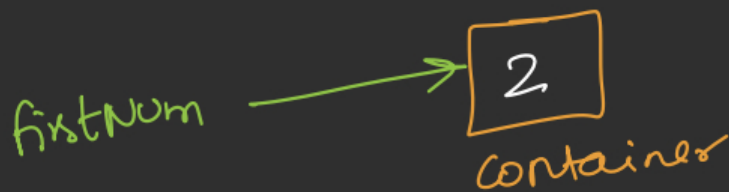
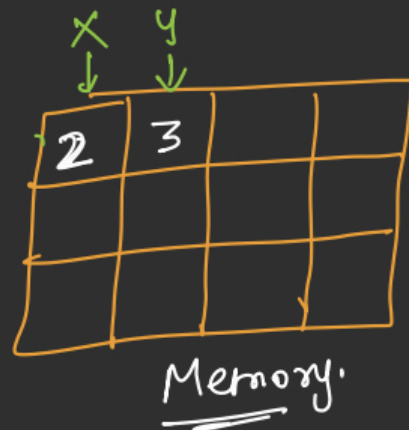
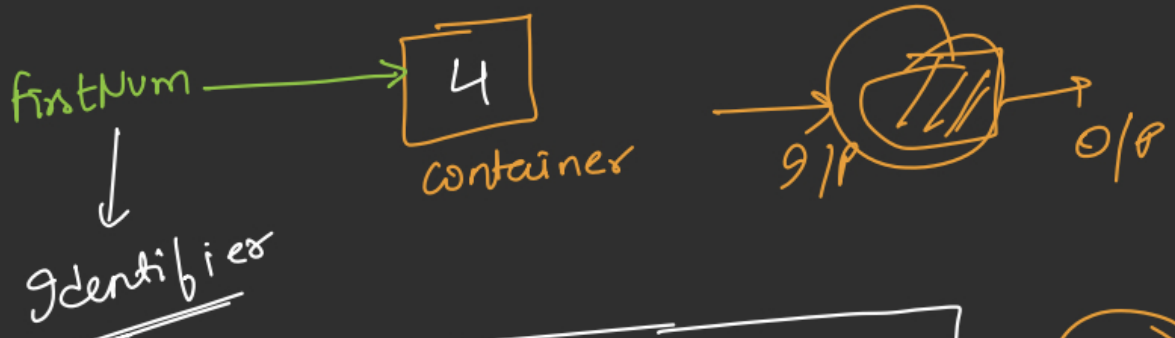


## Variables



$$x + y =$$
$$2 + 3 = ? \quad 5$$





```
Public class Demo {  
    public static void main(String[] args) {  
    }  
}
```

Black Box

firstNum = 10; | Statically typed

↳ Datatype

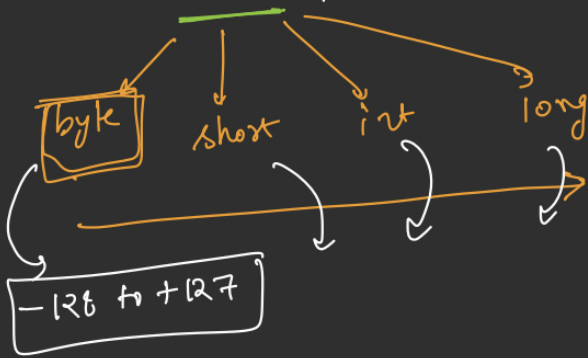


- ↳ Integer → byte, short, int, long.
- ↳ Real No. → float, double
- ↳ Character → char
- ↳ Boolean → boolean.

# Integer

firstNum  $\rightarrow$   

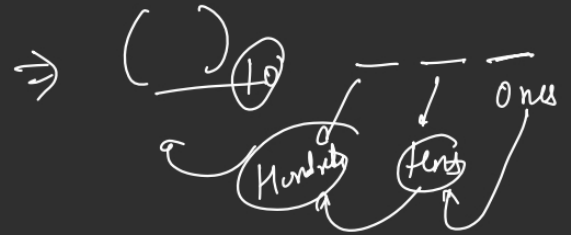
firstNum = 10 ;



$(4)_{10} \rightarrow$

0-9

10, 11, 12, 13, ...



0-1

$\rightarrow 0, 1, -$

$$= \frac{1}{2^1} \cdot \frac{1}{2^0} = 2$$

$$( )_2 \begin{array}{c} \downarrow \\ 2^2 \\ \downarrow \\ 2^2 \\ \downarrow \\ 2^1 \\ \downarrow \\ \text{ones} \\ 2^0 \end{array}$$

$$4 = \frac{1}{2^2} \cdot \frac{0}{2^1} \cdot \frac{0}{2^0} = 3 = 4$$

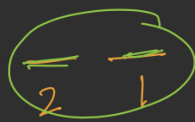
$$\frac{0}{4} \cdot \frac{0}{2} \cdot \frac{1}{1} \cdot \frac{0}{1} \cdot \frac{0}{1}$$

Name	Width	Range
long	64	-9,223,372,036,854,775,808 to 9,223,372,036,854,775,807
int	32	-2,147,483,648 to 2,147,483,647
short	16	-32,768 to 32,767
byte	8	-128 to 127

$$2^8 - 1 = 256 - 1 = 255$$

$$10 = \underline{0} \underline{0} \underline{0} \underline{0} \underline{0} \underline{0} \underline{1} \underline{0}$$

Every No. is signed in java



$$\begin{array}{r} 00 \\ 01 \\ 10 \\ \hline 11 \\ 21 \end{array}$$

$$\begin{array}{r} 000 \\ 000 \\ 000 \\ 000 \\ \hline 111 \\ 421 \end{array} = 7$$

$$2^n - 1 = 0$$

$$n = 2^n$$

$$2 = 2^2 = 4$$

$$2^3 = 2^3 = 8$$

$$2^3 - 1 = 8 - 1 = 7$$

$$\rightarrow \begin{array}{r} \underline{1} \quad \underline{1} \quad \underline{1} \quad \underline{1} \quad \underline{1} \quad \underline{1} \quad \underline{1} \quad \underline{1} \\ 128 \quad 64 \quad 32 \quad 16 \quad 8 \quad 4 \quad 2 \quad 1 \end{array} = 255$$

## Real Numbers

↓  
Floating point No.

↳ 5.23  
↳ 10.02

Float

double.

num

5.23

num = 5.23 ;

Name	Width in Bits	Approximate Range
double	64	4.9e-324 to 1.8e+308
float	32	1.4e-045 to 3.4e+038

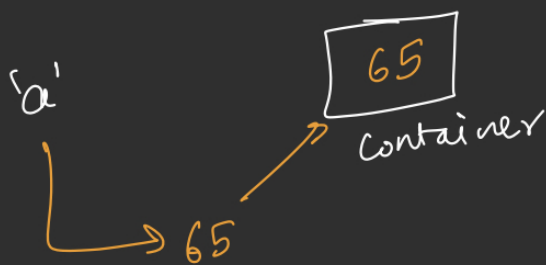
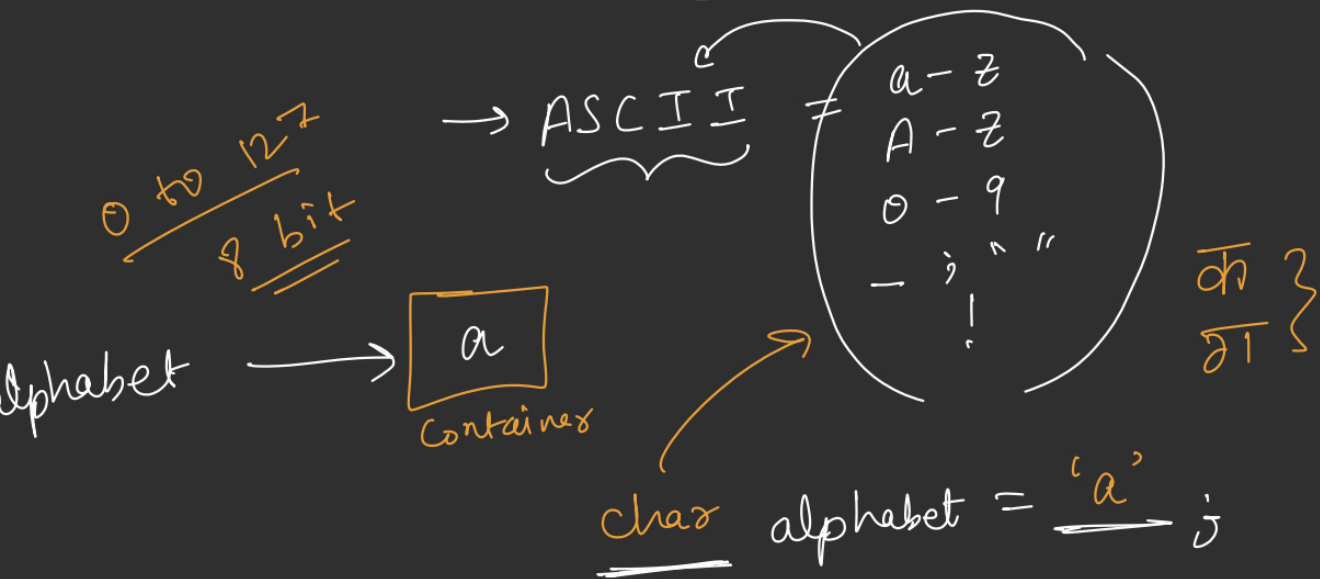
Float → Single precision

double → Double precision

double → sin(), cos(), atan()

## Characters

↳ char → Unicode



Java →

Unicode

Char → 16 bit

dh = 9  
→ = 10  
| |  
| |  
| |

Boolean → boolean

true      false

boolean b = false;



variable

Literal



b  
(Identifier)



`int X = 5;`

declaring & defining at the same time.

declaration →


`int X;`

definition →

`X = 4;`

X ↓  
24  
int  
← 32 bit

### Keywords

class → 

- ↳ System.out.println ( ) ;
- ↳ class
- ↳ public
- ↳ static
- ↳ void

Reserved words by Java.

⇒ `68 Keywords` ✓✓

⇒ `goto, const`

## Comments

// - - - - -

/ \*

==

\* /