

Binary  $\Rightarrow$  either True/false

	a	b
< $\Rightarrow$	10 < 20 $\Rightarrow$ true	10 < 10 $\Rightarrow$ false
> $\Rightarrow$	10 > 20 $\Rightarrow$ false	20 > 10 $\Rightarrow$ true
<= $\Rightarrow$	10 <= 20 = true	10 <= 10 = true
	20 <= 10 = false	
>= $\Rightarrow$	10 >= 5 $\Rightarrow$ true	5 >= 5 = true
	3 >= 4 = false	

==

↓

comparison op<sup>n</sup>

int a = 10;

↓

assignment op<sup>s</sup>

a

10

[10 == 10]  $\Rightarrow$  true

a = 10;  $\Rightarrow$  initialization of value

!= (4 != 4)  $\Rightarrow$  false

(5 != 4)  $\Rightarrow$  True

Ques 1 →

n = 90

System.out.println(n > 100);  
↓  
true / false

90 ⇒ false

200 ⇒ true

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

```
    int x = scn.nextInt(); 8
```

```
    int y = scn.nextInt(); 5
```

```
    int z = scn.nextInt(); 10
```

```
    int w = scn.nextInt(); 4
```

```
    int xy = x*y;
```

```
    int zw = z*w;
```

x  
8

y  
5

z  
10

w  
4

xy  
40  
✓

zw  
40  
✓

→ System.out.println(xy==zw); True

/\* Enter your code here. Read input from STDIN. Print output to

}

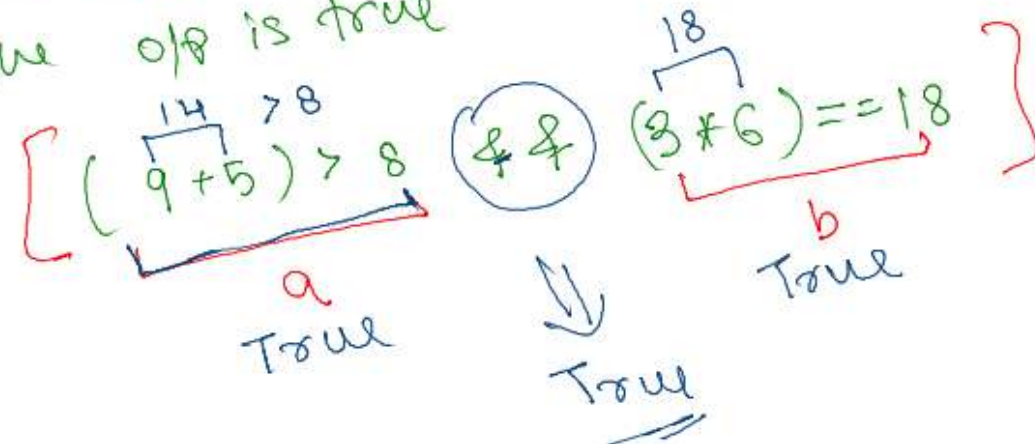
# logical operators

- ① && (AND)
- ② || (OR)
- ③ ! (NOT)

&& (\*) Trick  $\Rightarrow T=1, F=0$

a	b	ans
T(1)	T(1)	1 True
T(1)	F(0)	0 false
F(0)	T(1)	0 false
F(0)	F(0)	0 false

ans  $\neq$  if both the conditions are true then only the o/p is true



$\Rightarrow \text{|| (OR)} \quad \underline{\underline{+}}$

a	b	ans
T(1)	T(1)	T(1)
T(1)	F(0)	T(1)
F(0)	T(1)	T(1)
F(0)	F(0)	F(0)

$\Rightarrow$  (Red arrow from T(1) in row 3 to T(1) in row 4)

$(3 * 6) > 18$ $\underline{18 > 18}$ $\underline{\text{false}}$ $\underline{\underline{0}}$	$\text{  }$	$5 \% 2 == 1$ $\underline{1 == 1}$ $\underline{\text{true}}$ $\underline{1}$
	$\text{  }$ $\Downarrow$ $\text{true}$	

\* In && operator if any of the value either a or b is false the op will be false  
 \* In || operator if any of the value either a or b is true the op will be true



- T 1. boolean ans =  $40 >= 2 * 45 \mid \mid 30 >= 2 * 10$   
 T 2. boolean ans =  $40 > 3 \&\& 20 > 3$   
 F 3. boolean ans =  $50 > 7 \&\& 30 >= 40$   
 T 4. boolean ans =  $50 < 25 \mid \mid 30 > 2$   
 T 5. boolean ans =  $70 <= 75 \mid \mid 40 <= 2$   
 T 6. boolean ans =  $!(45 == 35)$   
 T 7. boolean ans =  $(20 < 32 \&\& 2 != 30) \&\& (35 >= 20 \mid \mid 35 != 25)$   
 T 8. boolean ans =  $!(20 >= 30)$   
 T 9. boolean ans =  $!(30 > 40)$   
 F 10. boolean ans =  $!(40 == 2 * 20) \&\& 75 == 15 * 5$   
 T 11. boolean ans =  $!(40 >= 40) \mid \mid (50 >= 2 * 25)$   
 T 12. boolean ans =  $!(10 * 5 == 50) \mid \mid (2 * 3 == 7 \mid \mid 9 == 28 / 3)$   
 T 13. boolean ans =  $(20 * 5 == 100 \mid \mid 10 != 10) \&\& (30 * 2 == 60 \mid \mid 50 < 40)$   
 F 14. boolean ans =  $(!(90 >= 40) \&\& !(80 > 36))$   
 F 15. boolean ans =  $((50 >= 20) \mid \mid 90 > 2 * 45) \&\& (30 != 2 * 15)$

Data types		Size	default value	Example
byte	numerical	1 byte	0	byte a = 1;
short	numerical	2 byte	0	short a = 10;
int	numerical	4 byte	0	int a = -200;
<u>long</u>	numerical	8 byte	0	long a = 99999;
float	decimal	4 byte	0.0	float f = 10.5f;
double	decimal	8 byte	0.0	double d = 10.5;
boolean	binary (T/F)	no size	false	boolean b = false;
char	character	2 byte	''	char ch = '\$';