

Introduction to logical opⁿ & compare operators

int a = 10;

→ assignment opⁿ

- ✓ * =
- ✓ -=
- ✓ +=
- ✓ /=
- ✓ %=

a *= 2; → $a = a * 2;$ ✓
 $a = 10 * 2 = 20$

a -= 2; → $a = a - 2;$ ✓
 $a = 10 - 2 = 8$

a += 2; → $a = a + 2;$ ✓
 $a = 10 + 2 = 12$

a /= 2; → $a = a / 2;$ ✓
 $a = 10 / 2 = 5$

a %= 2; → $a = a \% 2;$ ✓
 $a = 10 \% 2 = 0$

a
20

```
int a = 10;
a *= 2; ✓ a = a * 2
System.out.println(a); ✓ 20
a += 2; ✓ a = a + 2
System.out.println(a); ✓ 22
a -= 2; ✓ a = a - 2
System.out.println(a); ✓ 20
a /= 2; ✓ a = a / 2
System.out.println(a); 10
a %= 2; ✓ a = a % 2 = 10 % 2 = 0
System.out.println(a);
    ↳ 0
```

a
10 20 22 20 10 0

Conditional Operators

- $<, >$ (greater than, less than)
if either condition is satisfied then return **true**
- $<=, >=$ (greater than or equal to, less than or equal to)
 $a == a$ $a != a$ $a = 10$
- $=, ==$ (assignment op^r, compare op^r)
- $!=$ (not equal to)
 $!=$ $\begin{cases} \text{true} \\ \text{false} \end{cases}$

→ target, search input

value \leftarrow () $==$ compare
assign

Store these expressions inside a Boolean variable ans. Print their outputs true or false accordingly

a. Eg. boolean ans = 2+3>5, then System.out.println(ans)

b. $40+5 > 72 \rightarrow 40+5 > 72 \rightarrow \text{false}$

c. $78+93 \geq 100 \rightarrow 78+93 \geq 100 \rightarrow \text{true}$

d. $40+3 < 50 \rightarrow 40+3 < 50 \rightarrow \text{true}$

e. $90+91 \leq 181 \rightarrow 90+91 \leq 181 \rightarrow \text{true}$

f. $5 == 5 \rightarrow \text{true}$

g. $15 == 20 \rightarrow \text{false}$

h. $15 == 3*5 \rightarrow 15 == 15 \rightarrow \text{true}$

i. $15 == 3*6 \rightarrow 15 == 18 \rightarrow \text{false}$

j. $3 != 3 \rightarrow \text{false}$

k. $4 != 10 \rightarrow \text{true}$

l. $3*4 + 8*9 == 45 \rightarrow 12 + 72 == 45 \rightarrow \text{false}$

m. $2*3 + 4*5 != 5*4 + 7/5 \rightarrow 6 + 20 != 20 + 1 \rightarrow \text{true}$

n. $13/2 == 13.0/2 \rightarrow 6.5 == 6.5 \rightarrow \text{true}$

o. $15.0/2 + 7 == 14.5 \rightarrow 7.5 + 7 == 14.5 \rightarrow \text{true}$

$$5 > 5 \\ \boxed{2+3 > 5} = T / F$$

$$90+91 \leq 181 = ? \quad T / F \quad \text{True} \\ \text{then} \\ \boxed{15} == \boxed{3*5}$$

$$3*4 + 8*9 == 45 \\ 12 + 72 == 45 \rightarrow \text{false}$$

$$2*3 + 4*5 != 5*4 + 7/5 \\ 6 + 20 != 20 + 1$$

$$\boxed{26 != 21} \Rightarrow \text{True}$$

$$13/2 == \boxed{13.0/2} \\ 6.5 == 6.5 \Rightarrow \text{false}$$

$$15.0/2 + 7 == 14.5 \\ 7.5 + 7 == 14.5 \Rightarrow \text{True}$$

\neq True \Rightarrow if both target & input is not equal
 it will return true
 false \Rightarrow if both target & input is equal
 then it will return false

cmd line / System \Leftarrow 109 100

x
109 100

```

Scanner scn = new Scanner(System.in);
int x = scn.nextInt(); ✓
System.out.println(x > 100); ✓
/* Enter your code here. Read input from STDIN. Print
  
```

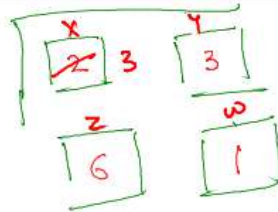
109 > 100 \Rightarrow true
 100 > 100 \Rightarrow false

```

public static void main(String[] args) {
    Scanner scn = new Scanner(System.in);
    int x = scn.nextInt();
    int y = scn.nextInt();
    int z = scn.nextInt();
    int w = scn.nextInt();

    System.out.println(x*y==z*w);
    /* Enter your code here. Read input from STDIN. Print output to STDOUT */
}

```



$$2 \times 3 == 6 \times 1$$

↓
true

$$3 \times 3 == 6 \times 1$$

↓
false

even & odd
↓
true ↓
false

System.out.println(n % 2 == 0)

101113 % 2 == 0

101113 % 2 == 0

1 == 0

↓
false

0 == 0 → True

sum and compare
↓

a b c

10 20 30

System.out.println(a + b + c < 150)

10 + 20 + 30 < 150

60 < 150 ⇒ True

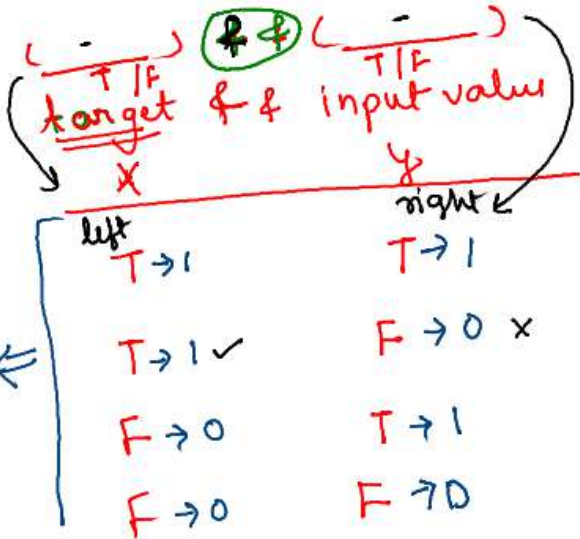
130 = 10 + 20 + 130 < 150

= 180 < 150

↓
false

$\&\& \Rightarrow \text{And} \Rightarrow$
 $\parallel \Rightarrow \text{OR}$

True $\leftarrow 1$
 false $= 0$
 false $= 0$
 false $= 0$



\Downarrow
false dominator

(+) target \parallel input data
 (~~T~~) \parallel (~~T~~)
 T/F T/F

True $1 \Leftarrow T - 1$
 True $1 \Leftarrow T - 1$
 True $1 \Leftarrow F - 0$
 false $0 \Leftarrow F - 0$

T - 1
 F - 0
 T - 1
 F - 0

true is dominator

1. $3 > 2 \ \&\& \ 14 > 3$
2. $40 > 3 \ \&\& \ 40 > 50$
3. $40 >= 40 \ \|\ 50 >= 2 * 25$
4. $(2 * 3 == 4 \ \&\& \ 6 * 4 == 9) \ \|\ (4 > 2)$
5. $(4 > 5) \ \&\& \ (3 > 5 \ \&\& \ 80 == 2 * 40)$

$$\textcircled{1} \quad \overset{T}{3 > 2} \quad \overset{T}{\&\&} \quad \overset{T}{14 > 3} \Rightarrow \text{True}$$

$$\textcircled{2} \quad \overset{T}{40 > 3} \quad \&\& \quad \overset{F}{40 > 50} \Rightarrow \text{false}$$

$$\textcircled{3} \quad \underbrace{40 >= 40}_T \ \|\ 50 >= 2 * 25$$

$$\textcircled{4} \quad (2 * 3 == 4 \ \&\& \ 6 * 4 == 9) \ \|\ (4 > 2) \quad \overset{T}{\&\&} \quad \overset{T}{\|\ } \quad \overset{T}{\Rightarrow \text{True}}$$

$$(\text{f} \ \&\& \ \text{F}) \ \|\ \text{True}$$

$$\downarrow \quad \text{f} \ \|\ \text{T} \Rightarrow \text{true}$$

$$0 + 1 = 1$$

$$\textcircled{5} \quad (4 > 5) \ \&\& \ (3 > 5 \ \&\& \ 80 == 2 * 40)$$

$$(\text{f}) \ \&\& \ (\text{f} \ \&\& \ \text{T})$$

$$\text{f} \ \&\& \ \text{f} \Rightarrow \text{false}$$

$$0 \ \&\& \ 0 = 0$$