10-9-2025 Wednesday.

```
n = 50
if (10<=n<=100):
    print("Yes")
else:
    print("No")
```

A new format for Ranges.

```
n = 170
101<=n<=200
```
= TRUE

⇒ Bitwise Operator in bit values

2^0 = 1 (0, 1)

2^1 = 2 (0 0, 0 1, 1 0, 1 1)

2^2 = 4 2^3 = 8 2^4 = 16

	16	8	4	2	1
1	0	0	0	0	1
2	0	0	0	1	0
3	0	0	0	1	1
4	0	0	1	0	0
5	0	0	1	0	1
6	0	0	1	1	0
7	0	0	1	1	1
8	0	1	0	0	0
9	0	1	0	0	1
10	0	1	0	1	0

2**n

→ & | ~ ^ >> <<

15 ⇒ 1 1 1 1

6 ⇒ 0 1 1 0

(i) &

0 1 1 0 ⇒ 6

15 & 6 ⇒ 6

Rule for & is 1 & 1 = 1 otherwise 0

```
  1 1 1 1
& 0 1 1 0
---------
  0 1 1 0 = 6
```
15 & 6

AND

```
  6 & 15
  0 1 1 0
& 1 1 1 1
---------
  0 1 1 0   6
```

0 + 0 = 0

1 + 0 = 1

1 + 1 = 0 Carry 1

1 + 1 = 2 ⇒ 10

1 + 1 + 1 = 3 ⇒ 11

Sum = 1 Carry = 1

(ii) | - OR

```
  1 1 1 1   15
| 0 1 1 0   6
-----------
  1 1 1 1
  8 4 2 1
```
OR

15 | 6 ⇒ 15

1111

12 ⇒ 1 1 0 0

3 ⇒ 0 0 1 1

12 & 3 = 0 0 0 0

12 | 3 = 15

```
  1 1 0 0
| 0 0 1 1
---------
  1 1 1 1
```

③ left shift << This shifts all bits to the left & fills with 0 on the right.

* 5<<1 = 10 → 0101 << ⇒ 1010 = 10

* 5<<2 = 20

0101 <<2 ⇒ 0100 ⇒ 20

0 1 0 1 0 0
128 64 32 16 8 4 2 1

$n * (2^k)$

$5 * 2^1 = 5 \times 2 = 10$ (2)

$5 * 2^2 = 5 \times 4 = 20$

④ Right shift >> ← right & fills with 0 on the left.

⇒ 5 >> 1 0101 >>1 ⇒ 0010 = 2

5 >>2 0101 >>2 ⇒ 0001 = 1

$n // (2^k)$

$5 // 2^1 = 5/2 = 2$

$5 // 2^2 = 5/4 = 1$

20 >>1 10100 >>1 01010 = 10

20 >>2 10100 >>2 00101 = 5

13 >>2 1101 <<2 0011 = 3

13 <<2 1101 <<2 110100 = 52

32+16+4 = 52

$n * (2^k)$

$13 * 2^2$ $13 \times 4 = 52$

⇒ Conditional

(iv) Nested if statement

Syntax:

```
if (Condition1):
    if (C2):
        st of C2
    else:
        st of inner if else
else:
    st of outer if else
```

outer if
inner if
inner if else
outer if else

```
n=int(input("Enter no:"))
if (n>=0):
    if (n>0):
        print("+ve")
    else:
        print("Zero")
else:
    print("-ve")
```

-2

18-9-2025