**10-09-25**

**September 10**

**Bit-wise Operators:**

**Formula**: 2\*\*n

n is the number of bits

Binary digits if it is one bit: only two combinations are possible (1,0)

if it is 2 bits: four combinations are possible - 00 01 10 11(0-3)

if it is 3 bits: eight combinations- 000 001 010 001 100 110 101 111(0-7)

if it is 4 bits: 16 combinations (0-15)

if it is 5 bits: 0-31

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Binary representation of decimal numbers:

0-000

1-001

2-010

3-011

4-100

5-101

6-110

7-111

9-1001

12-1100

15-1111

Bit wise operators in python: & | ~ >> <<

**Bitwise and,or**

1 1 1 1 **=>** 15

0 1 1 0 **=>** 6

*and*

0 1 1 0 **=>** 6

*or*

1 1 1 1 **=>** 15

Examples:

15 **&** 6

6

15 **|** 6

15

1 1 0 0 **=>** 12

0 0 1 1 **=>** 3

*# and*

0 0 0 0 **=>** 0

*#or*

1 1 1 1 **=>** 15

12 **&** 3

0

12 **|** 3

15

3 **&** 12

0

3 **|** 12

15

**left shift and right shift:**

​

right shift 13 by 2 times

13 >> 2

1 1 0 1 => 13

after one left shift:

0 1 1 0

after two shifts:

0 0 1 1

​

13 >> 2 = 3

​

left shift 13 by 2 places

13 << 2

1 1 0 1 => 13

after one left shift:

1 1 0 1 0 => 26

after two shifts:

1 1 0 1 0 0 => 52

​

13 << 2 = 52

13 **>>** 2

3

13 **<<** 2

52

**Nested if Statements:**

* one if inside another if is considered as nested if statements.
* we should write two if statements one after the other.
* Both statements are dependent and have some relation.
* The computational time is comparatively less than the if...elif...else statements.

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**Syntax:**

if(condition1):#outer if

  if(condition2):#inner if

      statements of condition2

    else:

      statements of inner else

else:

  statements of outer else

​Example:

Write a program to print if the given number is positive,negative or zero

n **=** int(input("enter a number : "))

**if**(n **>=** 0):

**if**(n **>** 0 ):

print("The number is +ve")

**else**:

print("The number is -ve")

enter a number : -2

The number is -ve