Logical Operators
Logical operators are used to combine two or more boolean expressions or conditions or test. Logical operators are represented using keywords.

Operator	Description
and	and operator (binary)
or	or operator (binary)
not	not operator (unary)

and operator truth table

Opr1	Opr2	Opr1 and Opr2
True	**True**	**True**
False	**True**	**False**
True	**False**	**False**
False	**False**	**False**

If any operand is False, the complex expression returns False.

Example:

```
>>> True and True
True
>>> True and False
False
>>> False and True
False
>>> False and False
False
>>> 10>2 and 10>5
True
>>> 10>2 and 10>20
False
>>> 10>20 and 10>2
False
>>> 10>20 and 10>50
False
```

Example:

```
# login application
```

```
user=input("UserName :") # nit
pwd=input("Password :") # xyz

print("Welcome") if user=="nit" and pwd=="nit123" else print("invalid
username or password")
```

Output:

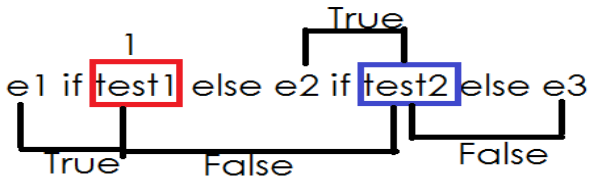
```
UserName :nit
Password :nit123
Welcome

UserName :nit
Password :xyz
invalid username or password

UserName :abc
Password :nit123
invalid username or password
```

Multiple conditional operators

This syntax is used to evaluate expression based on more than one condition/test.




```
"A"  if True else "B" if True else "C"

"X" if False else "Y" if False else "Z"

"X" if False else "Y" if True else "Z"
```

 # write a program to find input number is
 # +ve,-ve or zero

```
num=int(input("Enter any number"))
```

```
print("+ve") if num>0 else print("-ve") if num<0 else print("zero")
```

Output:

```
Enter any number10
+ve

Enter any number-5
-ve

Enter any number0
Zero
```

 # write a program to input character and find
 # is alphabet, digit or speical character

```
ch=input("Enter one character")
print("Alphabet") if ch>='A' and ch<='Z' else print("Alphabet") if ch>='a' and
ch<='z' else print("Digit") if ch>='0' and ch<='9' else print("Special
Character")
```

Output:

```
Enter one characterA
Alphabet

Enter one charactera
Alphabet

Enter one character8
Digit

Enter one character$
Special Character
```

Example:

```
>>> True and True
True
>>> 100 and 200
200
>>> 0 and 100
```

0
>>> 100 and 200 and 300
300
>>> 100 and 0 and 300
0
>>> "java" and "oracle" and "python"
'python'

or operator
truth table of or operator

Opr1	**Opr2**	**Opr1 or opr2**
True	False	True
False	True	True
True	True	True
False	False	False

If any operand is True, the complete expression return True.

Example:
>>> True or False
True
>>> False or True
True
>>> True or True
True
>>> False or False
False

 # write a program input name and 2 subject marks
 # and find result (pass/fail)

```
name=input("Enter Name ")
sub1=int(input("Enter Subject1 "))
sub2=int(input("Enter Subject2 "))
print(name,"Fail") if sub1<40 or sub2<40 else print(name,"Pass")
```

Output:
Enter Name naresh
Enter Subject1 60

Enter Subject2 70
naresh Pass

Enter Name suresh
Enter Subject1 30
Enter Subject2 90
suresh Fail

 # write a program to find input character is vowel

```
ch=input("Enter any character")

print("Vowel") if ch=='a' or ch=='e' or ch=='i' or ch=='o' or ch=='u' else
print("not vowel")
```

Output:
Enter any charactera
Vowel

Enter any characterA
not vowel

Enter any characterx
not vowel

Example:

```
>>> True and True or True
True
>>> True or True and False
True
>>> 100 or 200 and 300
100
>>> 100 and 200 or 300
200
>>> 100 and 0 or 300
300
>>> 100 and 0 and 300
0
```

not operator
this operator is used with other operator

Truth table of not operator

Opr1	**not opr1**
True	False
False	True

Example:
>>> not True
False
>>> not False
True

Membership Operator
Membership operator is used for searching a given value into group of values (collections)

1. in
2. not in

It is a binary operator and required 2 operands. This operator returns boolean value(True/False).

HOMEWORK

1. Python program to check Alphabet or not
2. Python program to check Alphabet or Digit
3. Python program to check Character is an Alphabet, Digit or Special Character
4. Python program to check Digit or Not
5. Python program to check Lowercase or not
6. Python program to check Lowercase or Uppercase
7. Python Program to check Uppercase or not
8. Python program to check Vowel or Consonant