Dhirubhai Ambani University

(Formerly known as DA-IICT)

Topic: Operators

Course: Programming Lab

Course Code- PC503

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Operators

- An operator is a symbol that represents an operation that may be performed on one or more operands.
- An operand is a value that a given operator is applied to.
- Example: 4+3*k, + and * are the operators and 4, 3, and k are the operands

- Types of Operator

  - ❖ Arithmetic Operators
  - ❖ Comparison Operators
  - ❖ Logical Operators
  - ❖ Bitwise operators
  - ❖ Membership Operators
  - ❖ Identity Operators

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Arithmetic Operators

Arithmetic operators are used with numerc values to perform common mathematical operations:

Operator	Name	Example
+	Addition	x + y
-	Subtraction	x - y
*	Multiplication	x * y
/	Division	x / y
%	Modulus	x % y
**	Exponentiation	x ** y
//	Floor division	x // y

Arithmetic Operators

Program to Accept Two Integer Values from the user and Perform Arithmetic Operations

```
a=int(input("Input a"))
b=int(input("Input b"))
c=a+b
print(c)
```

```
Input a-2
Input b2
0
```

```
a=int(input("Input a"))
b=int(input("Input b"))
c=a-b
print(c)
```

```
Input a7
Input b5
2
```

```
a=int(input("Input a"))
b=int(input("Input b"))
c=a*b
print(c)
```

```
Input a2
Input b3
6
```

```
a=int(input("Input a"))
b=int(input("Input b"))
c=a/b
print(c)
```

```
Input a5
Input b2
2.5
```

```
a=int(input("Input a"))
b=int(input("Input b"))
c=a%b
print(c)
```

```
Input a5
Input b2
1
```

```
a=int(input("Input a"))
b=int(input("Input b"))
c=a//b
print(c)
```

```
Input a5
Input b2
2
```

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Comparison/Relational Operators

Comparison operators are used to compare two values:

Operator	Name	Example
==	Equal	x == y
!=	Not equal	x != y
>	Greater than	x > y
<	Less than	x < y
>=	Greater than or equal to	x >= y
<=	Less than or equal to	x <= y

Comparison/Relational Operators

Program to Accept Two Integer Values from the user and Perform Comparison Operations

```
a=int(input("Input a"))
b=int(input("Input b"))
if a==b:
    print(a+b)
else:
    print(a-b)
```

```
Input a5
Input b3
2
```

```
a=int(input("Input a"))
b=int(input("Input b"))
if a!=b:
    print(a+b)
else:
    print(a-b)
```

```
Input a5
Input b3
8
```

```
a=int(input("Input a"))
b=int(input("Input b"))
if a>b:
    print(a+b)
else:
    print(a-b)
```

```
Input a3
Input b2
5
```

```
a=int(input("Input a"))
b=int(input("Input b"))
if a<b:
    print(a+b)
else:
    print(a-b)
```

```
Input a3
Input b2
1
```

```
a=int(input("Input a"))
b=int(input("Input b"))
if a>=b:
    print(a+b)
else:
    print(a-b)
```

```
Input a3
Input b3
6
```

```
a=int(input("Input a"))
b=int(input("Input b"))
if a<=b:
    print(a+b)
else:
    print(a-b)
```

```
Input a3
Input b2
1
```

Logical Operators

Logical operators are used to combine conditional statements:

Operator	Description	Example
and	Returns True if both statements are true	x < 5 and x < 10
or	Returns True if one of the statements is true	x < 5 or x < 4
not	Reverse the result, returns False if the result is true	not(x < 5 and x < 10)

Logical Operators

Program to Accept Two Integer Values from the user and Perform Logical Operations

```
a=int(input("Input a"))
b=int(input("Input b"))
if a>5 and b<5:
    print(a+b)
else:
    print(a-b)
```

```
Input a9
Input b6
3
```

```
a=int(input("Input a"))
b=int(input("Input b"))
if a>5 or b<5:
    print(a+b)
else:
    print(a-b)
```

```
Input a9
Input b6
15
```

```
a=int(input("Input a"))
b=int(input("Input b"))
if not(a>5 or b<5):
    print(a+b)
else:
    print(a-b)
```

```
Input a9
Input b6
3
```

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Bitwise Operators

- Bitwise operators act on operands as if they are a string of binary digits.
- It operates bit by bit.

Operator	Meaning
&	Bitwise AND
|	Bitwise OR
~	Bitwise NOT
^	Bitwise XOR
>>	Bitwise right shift
<<	Bitwise left shift

Bitwise Operators

Program to Accept Two Integer Values from the user and Perform Bitwise Operations

```
a = int(input("Input a: "))
b = int(input("Input b: "))

print("Bitwise AND (a & b):", a & b)
print("Bitwise OR (a | b):", a | b)
print("Bitwise XOR (a ^ b):", a ^ b)
print("Bitwise NOT (~a):", ~a)
print("Bitwise Left Shift (a << 1):", a << 1)
print("Bitwise Right Shift (a >> 1):", a >> 1)
```

```
Input a:  5
Input b:  2
Bitwise AND (a & b): 0
Bitwise OR (a | b): 7
Bitwise XOR (a ^ b): 7
Bitwise NOT (~a): -6
Bitwise Left Shift (a << 1): 10
Bitwise Right Shift (a >> 1): 2
```

In binary
5= 0101
2= 0010

AND: 0000 =0
OR: 0111=7
XOR: 0111=7
NOT: 1010= -6 (2's Complement)
Left: 1010=10
Right: 0010=2

Membership Operators

- in and not in are the membership operators in Python. They are used to test whether a value or variable is found in a sequence (string, list, tuple, set and dictionary).

```
In [20]: x = 'Hello world'
         print('h' in x)

         False

In [19]: print('H' in x)

         True

In [21]: print('K' not in x)

         True
```

Exercise- 3

Write a program that checks if a given character exists in a string. Take input from the user for the string and the character.

```
text=input("Enter the text")
char= input("Enter a character to check")
print(char in text)
```

```
Enter the text hi shyam
Enter a character to check a
True
```

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Identity Operators

- is and is not are the identity operators in Python, not the equality operator. They check whether **two variables refer to the exact same object in memory**, not just if their contents are equal.

```
In [22]: x = ["apple", "banana"]
         y = ["apple", "banana"]
         z = x
         print(x is z)

         True

In [23]: print(x is y)

         False
```

```
x=["apple", "banana"]
y=["apple", "banana"]
z=x
print(id(x))  # Memory address of x
print(id(y)) # Memory address of y
print(id(z)) # Memory address of z
```

```
2063128871104
2063182771264
2063128871104
```

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