Python Notes – Operators

Prepared by: **Dhananjay Kumar**

🧑‍🏫 Trainer | Java Full-Stack & Python | Contact: 7023577968

LinkedIn: Dhananjay Kumar

What are Operators?

Operators are special symbols that perform operations on variables and values.

Types of Operators in Python:

1. **Arithmetic Operators** → +, -, *, /, %, //, **
2. **Comparison (Relational) Operators** → ==, !=, >, <, >=, <=
3. **Logical Operators** → and, or, not
4. **Assignment Operators** → =, +=, -=, *=, /=, %=, //=, **=
5. **Bitwise Operators** → &, |, ^, ~, <<, >>
6. **Membership Operators** → in, not in
7. **Identity Operators** → is, is not

1. Arithmetic Operators

```python
In [5]: a = 15
        b = 4

        print("Addition:", a + b)
        print("Subtraction:", a - b)
        print("Multiplication:", a * b)
        print("Division:", a / b)
        print("Floor Division:", a // b)
        print("Modulus:", a % b)
        print("Exponent:", a ** b)
```

```
Addition: 19
Subtraction: 11
Multiplication: 60
Division: 3.75
Floor Division: 3
Modulus: 3
Exponent: 50625
```

2. Comparison Operators

```python
In [6]: x, y = 10, 20

        print("x == y:", x == y)
        print("x != y:", x != y)
        print("x > y:", x > y)
        print("x < y:", x < y)
        print("x >= y:", x >= y)
        print("x <= y:", x <= y)
```

```
x == y: False
x != y: True
x > y: False
x < y: True
x >= y: False
x <= y: True
```

3. Logical Operators

```python
In [7]: a, b = True, False

        print("a and b:", a and b)
        print("a or b:", a or b)
        print("not a:", not a)
```

```
a and b: False
a or b: True
not a: False
```

4. Assignment Operators

```python
In [9]:  num = 10
         num += 5    # num = num + 5
         print("After += :", num)

         num *= 2    # num = num * 2
         print("After *= :", num)
```

```
After += : 15
After *= : 30
```

5. Bitwise Operators

```python
In [10]:  x, y = 5, 3  # binary: 101, 011

          print("x & y (AND):", x & y)
          print("x | y (OR):", x | y)
          print("x ^ y (XOR):", x ^ y)
          print("~x (NOT):", ~x)
          print("x << 2 (Left Shift):", x << 2)
          print("x >> 2 (Right Shift):", x >> 2)
```

```
x & y (AND): 1
x | y (OR): 7
x ^ y (XOR): 6
~x (NOT): -6
x << 2 (Left Shift): 20
x >> 2 (Right Shift): 1
```

6. Membership Operators

```python
In [11]:  my_list = [1, 2, 3, 4, 5]

          print("2 in list:", 2 in my_list)
          print("10 not in list:", 10 not in my_list)
```

```
2 in list: True
10 not in list: True
```

7. Identity Operators

```python
In [12]:  x = [1, 2, 3]
          y = [1, 2, 3]
          z = x

          print("x is y:", x is y)        # False (different objects)
          print("x is z:", x is z)        # True (same object)
          print("x is not y:", x is not y)
```

```
x is y: False
x is z: True
x is not y: True
```

```python
In [20]:  ##  Practice Questions
          #1. Write a program to check if a number is divisible by 2 and 3.
          #2. Given two numbers, find which one is greater using comparison operators.
          #3. Use logical operators to check if a number lies between 10 and 50.
          #4. Demonstrate the use of membership operators with a string (e.g., "Python").
          #5. Write a program to swap two numbers using assignment operators only.
```

```python
In [14]:  # 1 Write a program to check if a number is divisible by 2 and 3.

          num = int(input("Enter a number: "))

          if num % 2 == 0 and num % 3 == 0:
              print(num, "is divisible by both 2 and 3")
          else:
              print(num, "is NOT divisible by both 2 and 3")
```

```
4 is NOT divisible by both 2 and 3
```

```python
In [15]:  # 2. Given two numbers, find which one is greater using comparison operators
          a = int(input("Enter first number: "))
          b = int(input("Enter second number: "))

          if a > b:
              print(a, "is greater than", b)
          elif b > a:
              print(b, "is greater than", a)
```

```python
    else:
        print("Both numbers are equal")
```

4 is greater than 3

In [16]:
```python
# 3. Use logical operators to check if a number lies between 10 and 50.
num = int(input("Enter a number: "))

if num >= 10 and num <= 50:
    print(num, "is between 10 and 50")
else:
    print(num, "is NOT between 10 and 50")
```

5 is NOT between 10 and 50

In [17]:
```python
# 4. Demonstrate the use of membership operators with a string (e.g., "Python").

word = "Python"

print("'P' in word:", 'P' in word)
print("'y' in word:", 'y' in word)    # Case sensitive
print("'on' in word:", 'on' in word)
print("'Java' not in word:", 'Java' not in word)
```

'P' in word: True
'y' in word: True
'on' in word: True
'Java' not in word: True

In [18]:
```python
# 5. Write a program to swap two numbers using assignment operators only.

a = int(input("Enter first number (a): "))
b = int(input("Enter second number (b): "))

print("Before swapping: a =", a, ", b =", b)

a = a + b    # step 1
b = a - b    # step 2
a = a - b    # step 3

print("After swapping: a =", a, ", b =", b)
```

Before swapping: a = 4 , b = 5
After swapping: a = 5 , b = 4

Python Operators – MCQs with Answers

In [21]:
```python
notes = """
Q1. What will be the output of the following code?
print(10 // 3)

a) 3.33

b) 3

c) 4

d) Error

Answer: b) 3


Q2. Which of the following is a logical operator in Python?

a) +

b) and

c) %

d) =

Answer: b) and


Q3. What is the output of:
print(2 ** 3 ** 2)

a) 64

b) 512
```

c) 256

d) 8

Answer: b) 512

Q4. What will print(5 == 5.0) output?

a) False

b) True

c) Error

d) None

Answer: b) True

Q5. Which operator is used for checking object identity in Python?

a) is

b) ==

c) in

d) :=

Answer: a) is

Q6. What will be the output of:
```
a = 5
a += 3
print(a)
```

a) 8

b) 5

c) 3

d) Error

Answer: a) 8

Q7. What will print("py" in "python") display?

a) True

b) False

c) py

d) Error

Answer: a) True

Q8. What is the result of:
```
print(not(10 > 5 and 5 < 3))
```

a) True

b) False

c) None

d) Error

Answer: a) True

Q9. Which of these will raise an error?

```
a) 10 / 0

b) 10 % 3

c) 10 // 3

d) 10 * 0

Answer: a) 10 / 0


Q10. What is the output of:
x = 10
y = 10
print(x is y)


a) True

b) False

c) Error

d) None

Answer: a) True
"""
```