Chandigarh University
Master of Engineeing—Artificial Intelligence

Experiment 1

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Subject: *Advanced Python Programming (24CSH-623)*
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Aim: Installation of Python and understanding of basic syntax and semantic rules. Write a python program to illustrate the concept of different types of operators.

1 Theory

1.1 Arithmetic Operators

Used for mathematical operations like addition (+), subtraction (−), multiplication (∗), division (/), modulo (%), integer division (//), and exponentiation (∗∗).

1.2 Assignment Operators

Used to assign values to variables (e.g., + =, − =, ∗ =, / =).

1.3 Comparison Operators

Used for comparing values (e.g., ==, ! =, <>, >, >=, <, <=). They return boolean results (‘True‘ or ‘False‘).

1.4 Logical Operators

Used to combine conditional statements (e.g., and, or, not).

1.5 Bitwise Operators

Used to perform bitwise operations on integer numbers (e.g., &, |, ‘ , <<, >>).

1.6 Identity Operators

Identity Operators: Used to compare objects (e.g., is, is not).

1.7 Membership Operators

Used to test whether a value is present in a sequence (e.g., in, not in).

2 Code

```
print("Arithmetic operators")
print("====================")
a = 7
b = 2
print("Sum: ", a + b)
print("Subtraction: ", a - b)
print("Multiplication: ", a * b)
print("Division: ", a / b)
print("Floor Division: ", a // b)
print("Modulo: ", a % b)
print("Power: ", a**b)
print("Assignment operators")
print("====================")
a = 10
b = 5
a += b  # a = a + b

print(a)
print("Comparison operators")
print("====================")
a = 5
b = 2
print("a == b =", a == b)
print("a != b =", a != b)
print("a > b =", a > b)
print("a < b =", a < b)
print("a >= b =", a >= b)
print("a <= b =", a <= b)
print("Logical operators")
print("=================")
print(True and True)  # True
print(True and False)  # False
print(True or False)  # True
print(not True)  # False
print("Bitwise operators")
print("=================")
x = 10
y = 4
print(x & y)
print(x | y)
print(-x)
print(x ^ y)
print(x >> 2)
print(x << 2)
print("Identity operators")
print("==================")
x1 = 5
y1 = 5
x2 = "Hello"
y2 = "Hello"
x3 = [1, 2, 3]
y3 = [1, 2, 3]
print(x1 is not y1)  # prints False
print(x2 is y2)  # prints True
print(x3 is y3)  # prints False
print("Membership operators")
```

```
57 print("====================")
58 message = "Hello world"
59 dict1 = {1: "a", 2: "b"}
60 print("H" in message)  # prints True
61 print("hello" not in message)  # prints True
62 print(1 in dict1)  # prints True
63 print("a" in dict1)  # prints False
```

3 Output

```
❯ python e1.py
Arithmetic operators
====================
Sum:  9
Subtraction:  5
Multiplication:  14
Division:  3.5
Floor Division:  3
Modulo:  1
Power:  49
Assignment operators
====================
15
Comparison operators
====================
a == b = False
a != b = True
a > b = True
a < b = False
a >= b = True
a <= b = False
Logical operators
=================
True
False
True
False
Bitwise operators
=================
0
14
-10
14
2
40
Identity operators
==================
False
True
False
Membership operators
====================
True
True
True
False
```

4 Learning Outcomes

Learnt about operators in Python.