Day10_Python Basics_Operators_Errors_NumberSystems

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1 Day 10 – Python Basics: Operators, Errors & Number Systems

Today I explored Python operators, common types of errors, and number systems like binary, decimal, octal, and hexadecimal. These are some of the most important foundational concepts in Python.

1.1 Topics Covered:

1.2 Types of operators

Arithmetic: +, -, *, /, //, %, **

Comparison: ==, !=, >, <, >=, <=

Logical: and, or, not

Assignment: =, +=, -=, etc.

Identity: is, is not

Membership: in, not in

1.3 Types of errors

Syntax Error

Runtime Error

Logical Error

1.4 Number systems

Decimal to Binary: bin(25) → 0b11001

Decimal to Octal: oct(25) → 0o31

Decimal to Hex: hex(25) → 0x19

Converting back to Decimal: int('11001', 2) → 25 These basics will help me avoid bugs, write better code, and understand how Python works behind the scenes.

2 Operators in Python

[1]:
```
# Arithmetic Operators
a = 10
b = 3
print(a + b)   # 13
print(a - b)   # 7
print(a * b)   # 30
print(a / b)   # 3.33
print(a % b)   # 1
print(a ** b)  # 1000
print(a // b)  # 3
```

```
13
7
30
3.3333333333333335
1
1000
3
```

[2]:
```
# Comparison Operators
print(a > b)   # True
print(a == b)  # False
```

```
True
False
```

[3]:
```
# Logical Operators
x = True
y = False
print(x and y)  # False
print(x or y)   # True
print(not x)    # False
```

```
False
True
False
```

[4]:
```
# Assignment Operators
a += 2  # Now a is 12
print(a)
```

```
12
```

[5]:
```
# Identity Operators
print(a is b)       # False
print(a is not b)   # True
```

```
False
True
```

[6]:
```
# Membership Operators
mylist = [1, 2, 3]
print(2 in mylist)      # True
print(4 not in mylist)  # True
```

```
True
True
```

3 Types of Errors in Python

[7]:
```
# Syntax Error (won't run)
 print("Hello
#  missing end quote
```

```
  Cell In[7], line 2
    print("Hello
    ^
IndentationError: unexpected indent
```

[8]:
```
# Runtime Error (runs but crashes)
num = 5
print(num / 0)
# ZeroDivisionError
```

```
---------------------------------------------------------------------------
ZeroDivisionError                         Traceback (most recent call last)
Cell In[8], line 3
      1 # Runtime Error (runs but crashes)
      2 num = 5
----> 3 print(num / 0)

ZeroDivisionError: division by zero
```

[9]:
```
# Logical Error (no crash but wrong logic)
marks = [90, 80, 70]
average = sum(marks) / 2  #  wrong logic, should be len(marks)
print("Average:", average)
```

```
Average: 120.0
```

4 Number Systems & Conversions

[10]:
```
# Decimal to Other Number Systems
num = 25
print(bin(num))  # 0b11001 → binary
print(oct(num))  # 0o31 → octal
print(hex(num))  # 0x19 → hexadecimal
```

```
0b11001
0o31
0x19
```

[11]:
```
# Decimal to Other Number Systems
num = 25
print(bin(num))  # 0b11001 → binary
print(oct(num))  # 0o31 → octal
print(hex(num))  # 0x19 → hexadecimal
```

```
0b11001
0o31
0x19
```