

## Experiment No:01

**Write programs to demonstrate variables, data types, operators, and type casting in Python.**

**1.Create variables to store your name, age, height, and whether you are a student. Print all variables and their data types.**

```
name = "ABC"  
  
age = 20  
  
height = 5.1  
  
is_student = True  
  
print(name, type(name))  
  
print(age, type(age))  
  
print(height, type(height))  
  
print(is_student, type(is_student))
```

```
ABC <class 'str'>  
20 <class 'int'>  
5.1 <class 'float'>  
True <class 'bool'>  
  
==== Code Execution Successful ===
```

**2. Take two integer inputs from the user and perform addition, subtraction, multiplication, division, floor division, modulus, and exponentiation. Print the results.**

```
a = int(input("Enter first number: "))  
  
b = int(input("Enter second number: "))  
  
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("Exponentiation:", a ** b)
```

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```
Enter first number: 4
Enter second number: 2
Addition: 6
Subtraction: 2
Multiplication: 8
Division: 2.0
Floor Division: 2
Modulus: 0
Exponentiation: 16
```

==== Code Execution Successful ===

3. Take two numbers as input and compare them using all comparison operators ( $>$ ,  $=$ ,  $\leq$ ). Print the boolean results.

```
x = int(input("Enter first number: "))

y = int(input("Enter second number: "))

print(x > y)

print(x < y)

print(x == y)

print(x != y)

print(x >= y)

print(x <= y)
```

```
Enter first number: 4
Enter second number: 2
True
False
False
True
True
False
```

==== Code Execution Successful ===

4. Check logical operators: Create two boolean variables and apply and, or, and not operators. Print the results.

a = True

b = False

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```
print("a and b:", a and b)
```

```
print("a or b:", a or b)
```

```
print("not a:", not a)
```

Output C

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

==== Code Execution Successful ====
```

**5. Type casting from string to integer and float:** Take a numeric string from the user, convert it to integer and float, and print their types.

```
num_str = input("Enter a numeric string: ")

num_int = int(num_str)

num_float = float(num_str)

print(num_int, type(num_int))

print(num_float, type(num_float))
```

Output Cle

```
Enter a numeric string: 5
5 <class 'int'>
5.0 <class 'float'>

==== Code Execution Successful ====
```

**6. Type casting from float to integer:** Take a float input from the user and convert it to an integer. Print both values and types.

```
num_float = float(input("Enter a float number: "))

num_int = int(num_float)

print("Float:", num_float, type(num_float))

print("Integer:", num_int, type(num_int))
```

Output

```
Enter a float number: 4.2
Float: 4.2 <class 'float'>
Integer: 4 <class 'int'>
t
\ === Code Execution Successful ===
```

**7. Type casting from integer to string:** Take an integer input and convert it to a string. Print the result and its type.

```
num = int(input("Enter an integer: "))

num_str = str(num)

print("String:", num_str, type(num_str))
```

Output

```
Enter an integer: 4
String: 4 <class 'str'>

\ === Code Execution Successful ===
```

**8. Perform arithmetic operations on variables of different data types (int + float, int + string after casting, etc.) and print results.**

```
a = 10

b = 5.5

print("int + float =", a + b)

a_str = str(a)

print("int + string (after casting) =", a_str + "5")
```

```
int + float = 15.5
int + string (after casting) = 105

\ === Code Execution Successful ===
```

**9. Swap two numbers using a temporary variable and print the result before and after swapping.**

```
a = int(input("Enter first number: "))

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

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

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

```
Enter first number: 4  
Enter second number: 2  
Before swapping: 4 2  
After swapping: 2 4  
  
==== Code Execution Successful ====
```

**10. Use input to calculate the area of a rectangle:** Take length and width as input, calculate area, and print. Ensure inputs are properly converted to float.

```
length = float(input("Enter length: "))  
width = float(input("Enter width: "))  
area = length * width  
print("Area of rectangle =", area)
```

```
Enter length: 5  
Enter width: 3  
Area of rectangle = 15.0  
  
==== Code Execution Successful ====
```

**11. Calculate the average of three numbers entered by the user. Use type casting if necessary.**

```
a = float(input("Enter first number: "))  
b = float(input("Enter second number: "))  
c = float(input("Enter third number: "))  
average = (a + b + c) / 3  
print("Average =", average)
```

```
Enter first number: 4  
Enter second number: 4  
Enter third number: 7  
Average = 5.0  
  
==== Code Execution Successful ====
```

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**12. Convert temperature:** Take temperature in Celsius as input and convert it to Fahrenheit. Print both values.

```
celsius = float(input("Enter temperature in Celsius: "))
```

```
fahrenheit = (celsius * 9/5) + 32
```

```
print(f"{celsius}°C = {fahrenheit}°F")
```

```
Enter temperature in Celsius: 45
45.0°C = 113.0°F

==== Code Execution Successful ====
```

**13. Check if a number is even or odd using the modulus operator and print the result.**

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

```
if num % 2 == 0:
```

```
    print("Even number")
```

```
else:
```

```
    print("Odd number")
```

```
Enter a number: 4
Even number

==== Code Execution Successful ====
```

**14. Perform a series of calculations:** Take two numbers, calculate sum, difference, product, quotient, and remainder. Then cast all results to strings and print them concatenated in a single sentence.

```
a = int(input("Enter first number: "))
```

```
b = int(input("Enter second number: "))
```

```
sum_ = a + b
```

```
diff = a - b
```

```
prod = a * b
```

```
quot = a / b
```

```
rem = a % b
```

```
print("Results: " + "Sum=" + str(sum_) + ", Difference=" + str(diff) + ", Product=" + str(prod) + ", Quotient=" + str(quot) + ", Remainder=" + str(rem))
```

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```
Enter first number: 4
Enter second number: 2
Results: Sum=6, Difference=2, Product=8,
Quotient=2.0, Remainder=0
```

```
==== Code Execution Successful ====
```

**15. User input for personal details:** Take name, age, and height as input, cast age to int and height to float, and print a formatted string showing all details.

```
name = input("Enter your name: ")
age = int(input("Enter your age: "))
height = float(input("Enter your height in feet: "))
print(f"My name is {name}, I am {age} years old and my height is {height} feet.")
```

```
Enter your name: am
Enter your age: 15
Enter your height in feet: 5.1
My name is am , I am 15 years old and my
height is 5.1 feet.
```

```
==== Code Execution Successful ====
```