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Software Proficiency Program II (Python Programming)

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.

Code :

```
name = "Smita"  
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))
```

Output :

```
Smita <class 'str'>  
20 <class 'int'>  
5.1<class 'float'>  
True <class 'bool'>
```

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

Code:

```
a = int(input("Enter first number: "))  
b = int(input("Enter second number: "))  
print("Addition:", a + b)  
print("Subtraction:", a - b)
```

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```
print("Multiplication:", a * b)
print("Division:", a / b)
print("Floor Division:", a // b)
print("Modulus:", a % b)
print("Exponentiation:", a ** b)
```

Output:

```
Enter first number: 10
Enter second number: 3
Addition: 13
Subtraction: 7
Multiplication: 30
Division: 3.33333333333
Floor Division: 3
Modulus: 1
Exponentiation: 1000
```

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

Code :

```
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)
```

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```
print(x <= y)
```

Output:

Enter first number: 5

Enter second number: 3

True

False

False

True

True

False

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

Code:

```
a = True
```

```
b = False
```

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

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

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

Output:

a and b: False

a or b: True

not a: False

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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.

Code:

```
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:

Enter a numeric string: 45

```
45 <class 'int'>  
45.0 <class 'float'>
```

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.

Code :

```
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: 9.7

```
Float: 9.7 <class 'float'>  
Integer: 9 <class 'int'>
```

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

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Code:

```
num = int(input("Enter an integer: "))  
num_str = str(num)  
print("String:", num_str, type(num_str))
```

Output:

Enter an integer: 25

String: 25 <class 'str'>

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

Code:

```
a = 10  
b = 5.5  
print("int + float =", a + b)  
a_str = str(a)  
print("int + string (after casting) =", a_str + "5")
```

Output:

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

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)  
temp = a  
a = b  
b = temp
```

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

Output:

Enter first number: 5

Enter second number: 10

Before swapping: 5 10

After swapping: 10 5

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.

Code:

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

Output:

Enter length: 5

Enter width: 3

Area of rectangle = 15.0

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

Code:

```
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)
```

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Output:

```
Enter first number: 10
Enter second number: 20
Enter third number: 30
Average = 20.0
```

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

Code:

```
celsius = float(input("Enter temperature in Celsius: "))
fahrenheit = (celsius * 9/5) + 32
print(f"{celsius}°C = {fahrenheit}°F")
```

Output:

```
Enter temperature in Celsius: 25
25.0°C = 77.0°F
```

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

Code:

```
num = int(input("Enter a number: "))
if num % 2 == 0:
    print("Even number")
else:
    print("Odd number")
```

Output:

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Enter a number: 7

Odd number

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.

Code:

```
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))
```

Output:

Enter first number: 10

Enter second number: 3

Results: Sum=13, Difference=7, Product=30, Quotient=3.333333333333335, Remainder=1

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.

Code:

```
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.")
```

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Output:

Enter your name: Smita

Enter your age: 20

Enter your height in feet: 5.1

My name is Smita, I am 20 years old and my height is 5.1 feet.