

## Assignment 1

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

**Code:**

```
# Creating variables
```

```
name = "Mohammad Sayeed"  
age = 20  
height = 5.9  
is_student = True
```

**Output:**

```
Name: Mohammad Sayeed | Data Type: <class 'str'>  
Age: 20 | Data Type: <class 'int'>  
Height: 5.9 | Data Type: <class 'float'>  
Is Student: True | Data Type: <class 'bool'>
```

```
# Printing variables and their data types
```

```
print("Name:", name, "| Data Type:", type(name))  
print("Age:", age, "| Data Type:", type(age))  
print("Height:", height, "| Data Type:", type(height))  
print("Is Student:", is_student, "| Data Type:", type(is_student))
```

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

```
# Taking two integer inputs from the user
```

```
num1 = int(input("Enter first number: "))  
num2 = int(input("Enter second number: "))
```

```
# Performing arithmetic operations
```

```
print("Addition:", num1 + num2)  
print("Subtraction:", num1 - num2)  
print("Multiplication:", num1 * num2)  
print("Division:", num1 / num2)  
print("Floor Division:", num1 // num2)  
print("Modulus:", num1 % num2)  
print("Exponentiation:", num1 ** num2)
```

**Output:**

```
Enter first number: 10  
Enter second number: 3  
Addition: 13  
Subtraction: 7  
Multiplication: 30  
Division: 3.333333333333335  
Floor Division: 3  
Modulus: 1  
Exponentiation: 1000
```

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

**Code:**

```
# Taking two numbers as input
a = float(input("Enter first number: "))
b = float(input("Enter second number: "))
# Comparing using all comparison operators
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)
```

**Output:**

```
Enter first number: 8
Enter second number: 5
a > b : True
a < b : False
a == b : False
a != b : True
a >= b : True
a <= b : False
```

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

**Code:**

```
# Creating two boolean variables
x = True
y = False
# Applying logical operators
print("x and y :", x and y)
print("x or y :", x or y)
print("not x :", not x)
print("not y :", not y)
```

**Output:**

```
x and y : False
x or y : True
not x : False
not y : True
```

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:**

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

# Type casting to integer and float
num_int = int(num_str)

num_float = float(num_str)

# Printing the values and their data types
print("Integer value:", num_int, "| Data Type:", type(num_int))
print("Float value:", num_float, "| Data Type:", type(num_float))
```

**output:**

```
Enter a numeric string: 25
Integer value: 25 | Data Type: <class 'int'>
Float value: 25.0 | Data Type: <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:**

```
# Program: Type casting from float to integer
# Taking float input from user
float_num = float(input("Enter a floating-
point number: "))

# Type casting float to integer
int_num = int(float_num)

# Displaying both values and their types
print("Original float value:", float_num)
print("Type of float value:", type(float_num))
print("Converted integer value:", int_num)
print("Type of integer value:", type(int_num))
```

**Output:**

```
Enter a floating-point number: 12.78
Original float value: 12.78
Type of float value: <class 'float'>
Converted integer value: 12
Type of integer value: <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.

Code:

```
# Program: Type casting from integer to string  
# Taking integer input from user  
int_num = int(input("Enter an integer number:  
"))  
  
# Type casting integer to string  
  
str_num = str(int_num)  
  
# Displaying result and its type  
  
print("Original integer value:", int_num)  
print("Type of integer value:", type(int_num))  
print("Converted string value:", str_num)  
print("Type of string value:", type(str_num))
```

Output:

```
Enter an integer number: 25  
Original integer value: 25  
Type of integer value: <class 'int'>  
Converted string value: 25  
Type of string value: <class 'str'>
```

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

Code:

```
# Program: Arithmetic operations on variables of different data types  
# Defining variables of different types  
  
int_num = 10  
float_num = 5.5  
str_num = "20"  
  
# Performing arithmetic operations  
  
result1 = int_num + float_num      # int + float  
result2 = int_num + int(str_num)    # int + string (after casting to int)  
result3 = float_num + float(str_num) # float + string (after casting to float)  
  
# Displaying results  
  
print("Integer number:", int_num)  
print("Float number:", float_num)  
print("String number:", str_num)
```

```
print("\nResult of int + float =", result1)
print("Type of result1:", type(result1))

print("\nResult of int + string (after
casting) =", 
result2)
print("Type of result2:", type(result2))
print("\nResult of float + string (after
casting) =", 
result3)
print("Type of result3:", type(result3))
```

**Output:**

```
Integer number: 10
Float number: 5.5
String number: 20

Result of int + float = 15.5
Type of result1: <class 'float'>

Result of int + string (after casting) = 30
Type of result2: <class 'int'>

Result of float + string (after casting) = 25.5
Type of result3: <class 'float'>
```

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

**Code:**

```
# Program: Swap two numbers using a temporary
variable

# Taking input from user
a = int(input("Enter first number: "))

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

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

# Swapping using a temporary variable
temp = a

a = b

b = temp

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

**output:**

```
Enter first number: 10
Enter second number: 20
Before swapping: a = 10 , b = 20
After swapping: a = 20 , b = 10
```

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:**

```
# Taking input from user  
  
length = float(input("Enter the length of  
the rectangle: "))  
  
width = float(input("Enter the width of  
the rectangle: "))  
  
# Calculating area  
area = length * width  
  
# Displaying result  
print("Area of the rectangle =", area)
```

**Output:**

```
Enter the length of the rectangle: 8.5  
Enter the width of the rectangle: 4.2  
Area of the rectangle = 35.7
```

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

**Code:**

```
#Program: Calculate the average of three  
numbers  
  
# Taking input from user  
num1 = float(input("Enter first number: "))  
  
num2 = float(input("Enter second number: "))  
  
num3 = float(input("Enter third number: "))  
  
# Calculating average  
average = (num1 + num2 + num3) / 3  
  
# Displaying result  
print("Average of the three numbers =", average)
```

**Output:**

```
Enter first number: 10  
Enter second number: 20  
Enter third number: 30  
Average of the three numbers = 20.0
```

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

**Code:**

```
# Program: Convert temperature from Celsius  
-to Fahrenheit  
  
# Taking input from user  
  
celsius = float(input("Enter temperature in Celsius: "))  
  
# Conversion formula  
  
fahrenheit = (celsius * 9/5) + 32  
  
# Displaying result  
  
print("Temperature in Celsius:", celsius)  
print("Temperature in Fahrenheit:", fahrenheit)
```

**Output:**

```
Enter temperature in Celsius: 25  
Temperature in Celsius: 25.0  
Temperature in Fahrenheit: 77.0
```

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

**Code:**

```
# Taking input from user  
  
num = int(input("Enter a number: "))  
  
# Checking even or odd using modulus operator  
  
if num % 2 == 0:  
  
    print(num, "is an even number.")  
  
else:  
  
    print(num, "is an odd number.")
```

**Output:**

```
Enter a number: 9  
9 is an 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.

```
num1 = float(input("Enter first number: "))

num2 = float(input("Enter second number: "))

# Performing calculations

sum_result = num1 + num2

diff_result = num1 - num2

prod_result = num1 * num2

quot_result = num1 / num2

rem_result = num1 % num2

# Converting all results to strings

sum_str = str(sum_result)

diff_str = str(diff_result)

prod_str = str(prod_result)

quot_str = str(quot_result)

rem_str = str(rem_result)

# Printing concatenated sentence

print("Sum is " + sum_str + ", Difference is " + diff_str + 

", Product is " + prod_str + ", Quotient is " + quot_str + 

", and Remainder is " + rem_str + ".")
```

#### Output:

```
Enter first number: 15
Enter second number: 4
Sum is 19.0, Difference is 11.0, Product is 60.0, Quotient is 3.75, and Remainder is 3.0.
```

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:**

```
# Taking inputs from user
name = input("Enter your name: ")
age = int(input("Enter your age: "))
height = float(input("Enter your height in centimeters: "))

# Displaying formatted details
print("Hello, ", name + "!")
print("You are", age, "years old and", height, "cm tall.")
```

**Output:**

```
Enter your name: Sayeed
Enter your age: 21
Enter your height in centimeters: 175.5
Hello, Sayeed!
You are 21 years old and 175.5 cm tall.
```