**Lab sheet 2**

**Objective**

To introduce and reinforce the fundamental concepts of Python programming and experience with input/output handling, basic data types, conditional statements, arithmetic operations, type checking, and string/list manipulations

**Theory**

This lab introduces students to the core principles of Python programming. Python is a high-level, easy-to-learn programming language that is widely used in software development, data analysis, artificial intelligence, web development, and more. In this lab, students focus on understanding how Python handles data, logic, and interaction with users.

**Input output operations**

The lab covers important concepts such as input/output operations, where the input() function allows user interaction and print() displays information to the screen. Students also work with different data types like integers, strings, lists, tuples, and sets — each having its own purpose and behavior. Recognizing these types and understanding how to manipulate them is essential for writing effective programs.

**Arithmetic operators and conditional operators**

Arithmetic operations are used for performing calculations, while conditional statements like if, elif, and else are introduced to make decisions based on certain conditions. These control structures are key for building dynamic programs that respond to different inputs.

**Type() function**

The lab also includes type checking using the type() function, which helps understand what kind of data a variable holds. Additionally, students explore list methods such as .count() and perform string slicing techniques like reversing strings using [::-1].

**1. Calculate the difference between a number and 17. If number > 17, return double the difference**.

num1 = int(input("Enter a number: "))

if num1 > 17:

print((num1 - 17) \* 2)

else:

print(17 - num1)

Example input: 25

Output: 16

**#2. Determine if a number is even or odd.**

num2 = int(input("Enter a number: "))

if num2 % 2 == 0:

print("Even number")

else:

print("Odd number")

Input: 9

Output: Odd number

**3. Count number 4 in a list.**

my\_list = [1, 4, 6, 4, 7, 4]

count = my\_list.count(4)

print("Number 4 appears", count, "times.")

Output: Number 4 appears 3 times.

**4. Swap two variables.**

a = 5

b = 10

a, b = b, a

print("a =", a, "b =", b)

Output: a = 10 b = 5

**5. Check type of values.**

val = [1, "text", [1,2], (3,4), {5,6}]

for i in val:

print(i, "is type", type(i))

Output:

1 is type <class 'int'>

text is type <class 'str'>

[1, 2] is type <class 'list'>

(3, 4) is type <class 'tuple'>

{5, 6} is type <class 'set'>

**6. Input two numbers and print sum, difference, product, quotient.**

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

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

print("Sum:", x + y)

print("Diff:", x - y)

print("Product:", x \* y)

if y != 0:

print("Quotient:", x / y)

else:

print("Cannot divide by zero")

Input: 8, 2

Output: Sum: 10, Diff: 6, Product: 16, Quotient: 4.0

**7. Reverse a string using slicing.**

text = input("Enter a string: ")

print("Reversed:", text[::-1])

Input: romis

Output: Reversed: simor

**8. Input stored in spam, print based on value.**

spam = input("Enter a value: ")

if spam == "1":

print("Hello Romis")

elif spam == "2":

print("Hi Romis")

else:

print("Greetings!")

Input: 2

Output: Hi Romis

**9. Two number input and output using match-case.**

m = int(input("Enter first number: "))

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

match "do":

case "do":

print("Sum:", m + n)

print("Diff:", m - n)

print("Product:", m \* n)

if n != 0:

print("Quotient:", m / n)

else:

print("Cannot divide by zero")

Input: 10, 5

Output: Sum: 15, Diff: 5, Product: 50, Quotient: 2.0

**10. Ask name and age, then print year they'll turn 100.**

name = input("Enter your name: ")

age = int(input("Enter your age: "))

year\_100 = 2025 + (100 - age)

print(name + ", you will turn 100 years old in the year", year\_100)

Input: Romis, 20

Output: Romis, you will turn 100 years old in the year 2105

**11. Convert temperature (C to F).**

temp = float(input("Enter temperature: "))

scale = input("Is it in (C)elsius or (F)ahrenheit? ").lower()

if scale == 'c':

print("In Fahrenheit:", (temp \* 9/5) + 32)

elif scale == 'f':

print("In Celsius:", (temp - 32) \* 5/9)

else:

print("Invalid input")

Input: 100, c

Output: In Fahrenheit: 212.0

**12. Age group categorization.**

age2 = int(input("Enter your age: "))

if age2 < 13:

print("Child")

elif age2 < 20:

print("Teenager")

else:

print("Adult")

Input: 21

Output: Adult

**13. Grade to GPA.**

grade = input("Enter your letter grade (A-F): ").upper()

if grade == "A":

print("GPA = 4.0")

elif grade == "B":

print("GPA = 3.0")

elif grade == "C":

print("GPA = 2.0")

elif grade == "D":

print("GPA = 1.0")

elif grade == "F":

print("GPA = 0.0")

else:

print("Invalid grade")

Input: B

Output: GPA = 3.0

**14. Check number is even, odd, zero, or invalid.**

val2 = input("Enter a number: ")

if val2.isdigit():

val2 = int(val2)

if val2 == 0:

print("Zero")

elif val2 % 2 == 0:

print("Even")

else:

print("Odd")

else:

print("Invalid")

Input: abc

Output: Invalid

**15. Check leap year**.

year = int(input("Enter a year: "))

if (year % 4 == 0 and year % 100 != 0) or (year % 400 == 0):

print("True (Leap Year)")

else:

print("False (Not a Leap Year)")

# Input: 2000

# Output: True (Leap Year)

**CONCLUSION**

Hence, from this Lab Report, we learn about the basics of Python programming.