

## Task 8 : Utilizing "Functions" concepts in Python

Dt: 03/09/25

Programming.

Aim: - To write the program using 'Functions' Concepts in Python.

- 7.1. You are developing a small python script to analyze and manipulate a list of student's grades for a class project. Write a python program that satisfies the above requirements using the built-in functions print(), len(), type(), max(), min(), sorted(), reversed() and range().

Algorithm:-

1. Start the program.
2. Print a welcome message : outputs a single greeting.
3. Determine and print the number of students : uses len() to find the number of elements in the student-names list.
4. Print the type of lists : uses type() to show the type of the student-names and student-grades lists.
5. Find and print highest and lowest grades : uses max() and min() to determine the highest and lowest values in student-grades.
6. Print sorted list of grades : uses sorted() to sort the grades.
7. Print reversed list of grades : uses reversed() to reverse the sorted list and converts it to a list.
8. Generate and print a range of grade indices : uses range() to create a list of indices from 1 to the number of students.
9. Stop.

Program:-

```
def analyze_student_grades():
```

```
# Sample data
```

```
student_names = ["Alice", "Bob", "Charlie", "Diana"]
```

```
student_grades = [85, 92, 78, 90]
```

```
# 1. Print a welcome message
```

```
print("Welcome to the Student Grades Analyzer!\n")
```

## Output

Welcome to the student grades analysis!

number of students: 4

type of student-names list : <class'list'>

type of student-grade list : <class'list'>

Highest grade: 92

lowest grade: 78

Sorted grades = [78, 85, 90, 92]

reversed grades = [92, 90, 85, 78]

grades indices from 1 to number of students: [1, 2, 3, 4]

# 2. Determine and print the number of students

num - students = len (Student - names)

Print ("Number of students:", num - students)

# 3. Print the type of the Student names list and the grades list

Print ("In Type of student - names list:", type (student - names))

Print ("Type of student - grades list:", type (student - grades))

# 4. Find the print the highest and lowest grade

highest - grade = max (student - grades)

lowest - grade = min (student - grades)

Print ("In highest grade:", highest - grade)

Print ("Lowest grade:", lowest - grade)

# 5. Print the list of grades sorted in ascending order

Sorted - grades = sorted (student - grades)

Print ("In sorted grades:", sorted - grades)

# 6. Print the list of grades in reverse order

reversed - grades = list (reversed (sorted - grades))

Print ("Reversed grades:", reversed - grades)

# 7. Generate and print a range of grade indices from 1 to the number of students

grade - indices = list (range (1, num - students + 1))

Print ("In Grade indices from 1 to number of students:", grade - indices)

# Run the analysis

Analyze Student grades ()

Q2. You are tasked with creating a small calculator application to help users perform basic arithmetic operations and greet them with a personalized message. Your application should perform the following tasks: addition, subtraction, multiplication, division.

Algorithm:-

1. Start the Program
2. User Input for Numbers: The program prompts the user to enter two numbers.
3. User Input the Operations: The program prompts the user to choose an arithmetic operation (addition, subtraction, multiplication, division)
4. Perform Operation: Based on the user's choice, the program performs the chosen arithmetic operations using the defined functions.
5. Display Results: The program displays the result of the operation
6. Stop

Program:

```
def add(a,b):
```

```
    """ Return the sum of two numbers """
    return a+b
```

```
def subtract(a,b):
```

```
    """ Return the difference between two numbers """
    return a-b
```

```
def multiply(a,b):
```

```
    """ Return the product of two numbers """
    return a*b
```

```
def divide(a,b):
```

```
    """ Returns the quotient of two numbers. Handles division by
        zero """
    if b != 0
        return a/b
    else
```

return "Error: Division by zero"

```
def greet(name):
```

```
    """ Returns a greeting message for the user """
    return f"Hello, {name}! Welcome to the program."
```

```
def main():
```

# Demonstrating the use of user-defined functions

## Output:

Arithmetic operations will stamp the numbers

Arithmetic operations will stamp the numbers

Sum of 10 and 5 : 15

Difference between 10 and 5 : 5

Product of 10 and 5 : 50

Quotient of 10 and 5 : 2.0

```

num1 = 10
num2 = 5
Print ("Arithmetic operations : ")
Print (f "sum of {num1} and {num2} : ", add (num1, num2))
Print (f "Difference between {num1} and {num2} : ", subtract (num1, num2))
Print (f "Product of {num1} and {num2} : ", multiply (num1, num2))
Print (f "Quotient of {num1} and {num2} : ", divide (num1, num2))

# Greeting the user
user_name = "Akash"
Print ("In Greeting : ")
Print (greet (user_name))

# Run the main function
if __name__ == "__main__":
    main()

```

(a) Python program to calculate sum, difference, product and quotient of two numbers and greet the user.

(b) Python program to calculate sum, difference, product and quotient of two numbers and greet the user.

(c) Python program to calculate sum, difference, product and quotient of two numbers and greet the user.

(d) Python program to calculate sum, difference, product and quotient of two numbers and greet the user.

(e) Python program to calculate sum, difference, product and quotient of two numbers and greet the user.

(f) Python program to calculate sum, difference, product and quotient of two numbers and greet the user.

(g) Python program to calculate sum, difference, product and quotient of two numbers and greet the user.

(h) Python program to calculate sum, difference, product and quotient of two numbers and greet the user.

(i) Python program to calculate sum, difference, product and quotient of two numbers and greet the user.

(j) Python program to calculate sum, difference, product and quotient of two numbers and greet the user.

(k) Python program to calculate sum, difference, product and quotient of two numbers and greet the user.

(l) Python program to calculate sum, difference, product and quotient of two numbers and greet the user.

(m) Python program to calculate sum, difference, product and quotient of two numbers and greet the user.

(n) Python program to calculate sum, difference, product and quotient of two numbers and greet the user.

(o) Python program to calculate sum, difference, product and quotient of two numbers and greet the user.

(p) Python program to calculate sum, difference, product and quotient of two numbers and greet the user.

(q) Python program to calculate sum, difference, product and quotient of two numbers and greet the user.

(r) Python program to calculate sum, difference, product and quotient of two numbers and greet the user.

(s) Python program to calculate sum, difference, product and quotient of two numbers and greet the user.

(t) Python program to calculate sum, difference, product and quotient of two numbers and greet the user.

(u) Python program to calculate sum, difference, product and quotient of two numbers and greet the user.

(v) Python program to calculate sum, difference, product and quotient of two numbers and greet the user.

(w) Python program to calculate sum, difference, product and quotient of two numbers and greet the user.

(x) Python program to calculate sum, difference, product and quotient of two numbers and greet the user.

(y) Python program to calculate sum, difference, product and quotient of two numbers and greet the user.

(z) Python program to calculate sum, difference, product and quotient of two numbers and greet the user.

MARKS SHEET	
EX NO.	b
PERFORMANCE (1)	5
RESULT AND ANALYSIS (2)	5
VIVA VOCE (3)	5
RECORD (4)	
TOTAL (15)	15
WITH DATE	

Result :

Thus the Python program using 'functions' concepts was successfully executed and the output was verified.