Task No:7 Utilizing 'Functions' concept in Python Programming.

Aim: To write the Python Program using 'Functions' concepts in Python Programming

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

Algorithm:

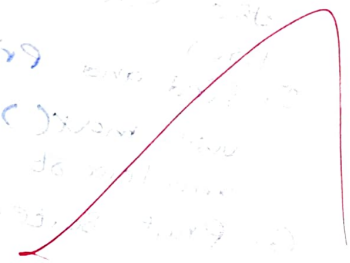
1. Start the Program
2. Print a welcome message: outputs a simple greeting
3. Determine and Print the number of students: use len() to find the number of elements in the student-names list.
4. Print the type of lists: uses type() to show the type of the student-names and student-grades lists
5. Find 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. 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!")
# 2. Determine and Print the number of students
num_students = len(student_names)
print("Number of students:", num_students)
```

output:

```
Welcome to the Student Grades Analyzer!
Number of students: 4
Type of student_name list: <class 'list'>
Type of student_grades list: <class 'list'>
Highest grade: 92
Lowest grade: 78
Sorted grades: [78, 85, 90, 92]
Reversed grades: [92, 90, 85, 78]
Grade indices from 1 to number of students:
[1, 2, 3, 4]
```



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

```
print ("\nType of student_names list:")
type(student_grades))
```

#4. Find and Print the highest and lowest grade

```
highest_grade = max(student_grades)
lowest_grade = min(student_grades)
Print("\nHighest grade:", highest_grade)
Print("Lowest grade:", lowest_grade)
```

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

```
sorted_grades = sorted(student_grades)
print("\nsorted 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("\nGrade indices from 1 to number of students:", grade_indices)
```

#Run the analysis

```
analyze_student_grades()
```

7.2 You are tasked with creating a small calculator application to help users perform basic arithmetic operations and greet them with a personalized message. Your program 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 for operation: The program prompts the user to choose a arithmetic operation the (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 Result:- The program display the result of the operation.
6. Stop.

7.2. Program:-

```
def add(a,b):
    """Return the sum of two numbers."""
    return a+b
def subtract(a,b):
    """Return the difference b/w two numbers"""
    return a-b
def multiply(a,b):
"""Return the Product of two numbers"""
    return a*b
def divide(a,b):
"""Return the Quotient of two numbers.
Handles division by zero"""
    if b!=0:
        return a/b
    else:
return "Error: Division by zero"
```

Output :-

Arithmetic operations:
Sum of 10 and 5: 15
Difference b/w 10 and 5: 5
Product of 10 and 5: 50
Quotient of 10 and 5: 20
Greeting:
Hello, Alice! Welcome to the program.

```
"""Return a greeting message for the user"""
return f"Hello {name}! Welcome to the Program"
def main():
    # Demonstrating the use of user-defined functions
    #Arithmetic operations
    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 = "Alice"
    print("\n Greeting:")
    print(greet(user_name))
# Run the main function
if __name__ == "__main__":
    main()
```

VEL TECH	
EX No.	6
PERFORMANCE (5)	
RESULT AND ANALYSIS (5)	5
VIVA VOCE (5)	
RECORD (5)	5
TOTAL (20)	19
SIGN WITH DATE	

Result:-

Thus the Python Programusing 'Functions' Concepts was successfully executed and the output was verified.