Task NO: 7 Utilizing 'Functions' concepts 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 list of student 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 simple greeting
3. Determine and print the number of students: uses len() to find the number of element in the student_names list.
4. Print the print types 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: use 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", "Charile", "Diana"]
    student_grades = [85, 92, 78, 90]
    print("Welcome to the student grades Analyzer!\n")
    num_students = len(student_names)
    print("Number of students:", num_students)
    print("\n Type of student_namelist:", type(student_names))
    print("Type of student_grades list:", type(student_grades))
    highest_grade = max(student_grades)
    lowest_grade = min(student_grades)
    print("\n Highest grade:", highest_grades)
    print("Lowest grades", lowest_grads)
    sorted_grades = sorted(student_grades)
    print("\n sorted grades:", sorted_grades)
    reversed_grades = list(reversed(sorted_grades))
    print("Reverse grades:", reversed_grades)
    students grade_indices = list(range(1, num_students+1))
    print("\n\nGrade indices from 1 to number of students:", grade_indices

analyze_student_grades()
```

Output:

```
Welcome to the student-grade 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]
```

o/p

Arithmetic Operations:

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

Greeting:

Hello, Alice! welcome to the program.

7.2: You are tasked with creating a small calculator application to help user perform basic arithmetic operations and greet them with a personalized message.

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 an arithmetic operation (addition, subtraction, multiplication, division).
4. perform operation: Based on the user's choice, the program performs the chosen arithmetic operation using the defined functions.
5. Display Result: The program displays the result of the operation.
6. Stop.

7.2 program:

```
def add(a,b):
    """Return the sum of two numbers."""
    return a+b
def substract (a,b):
    """Return the difference between two numbers."""
    return a-b
def multiply (a,b):
    """Return the product of two numbers"""
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"
def greet (name):
    """Return a greeting message for the user."""
    return f"Hello, {name}! welcome to the program".
def main():
    # Demonstrating the use of user_defined functions
    num1 =10
    num2 = 5
    Print (f"Arithmetic operations:")
    Print (f"Sum of {num1} and {num2}:", add(num1, num2))
    print (f"Difference between {num1} and {num2}:", substract (num1,num2))
    print (f"Product of {num1} and {num2}:", multiply (num1,num2))
    print (f"Quotient of {num1} and {num2}:", divide (num1,num2))
    user_name = "Alice"
    Print ("\n Greeting:")
    print (greet (user_name))
if __name__ == "__main__":
```

VEL TECH	
EX NO.	7
PERFORMANCE (5)	5
RESULT AND ANALYSIS (5)	5
VIVA VOCE (5)	5
RECORD (5)	—
TOTAL (20)	15
SIGN WITH DATE	10/9

Result: Thus the Python program using "functions" concept executed and the out put was verified. was successfully