1/9 Task-6: Otilizing 'Functions' concepts in Python Programming.

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

6.1 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 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: output a simple greeting.
3. Determine and Print the number of students: usen len() to find the number of elements in the student_names list.
4. Print the type of lists: use type() to show the type of student_names and student_grades lists.
5. Find and Print highest and lowest grades: use max() and min() to determine highest and lowest values in student_grades
6. Print sorted list of grade: uses reversed sort grade.
7. Generate and Print a range indices: uses range() to create a list of indices from 1 to number of students.
8. stop.

output:

Welcome to the student Grades Analyzer:
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]
Grade indices from 1 to number of students: [1, 2, 3, 4]

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")
    # 2. Determine and Print the number of students.
    num_students = len (student_names)
    Print ("Number of students:", num_students)
    # 3. Print the type of student names list and grade list.
    Print ("\n Type of student_names list:", type (student_names))
    Print ("Type of student_grades list:", type (student_grades))
    # 4. Find and Print highest and lowest grade.
    highest_grade = max
    lowest_grade = min
    Print ("\n Highest grade:", highest_grade)
    Print ("Lowest grade:", lowest_grade)
    # 5. Print the list of grades sorted in ascending orda.
    sorted_grades = sorted
    Printf ("\n sorted grades:", sorted_grades)
    # 6. Print the list of grades in reverse order.
    rerorsed_grades = list.
    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(,
    num_students + 1))
    Print ("\n Grade indices from 1 to number of students:",
    grade_indices)
    # Run the analysis
    analyze_student_grades()
```

1/9 Task-6

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6.2 You are tasked with creating a small calculator application to help users perform basic arithmetic operations and greet them with a personalized message. Your application should perform 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 an arithmetic operation.
4. Perform operation: Based on user's choice, the program performs the chosen arithmetic operation using function
5. Display Result: The program displays 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 product of two numbers."""
return a*b
def mottip divide (a,b):
"Return the quotient of two numbers. It 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 Program."
def main():
# Demonstrating the use of user-defined functions.
# Arithmetic operations.
num1 = 10
num2 = 25
Print ("Arithmetic operations:")
Printf (f"sum of {num1} and {num2}:", add (num1, num2))
Print (f"Difference between {num1} and {num2}:", subtract (num1,2))
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 ("In Greeting:")
Print (greet (user_name))
# Run the main function
if __name__ == "__main__":
 main()
```

**Output:**

```
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
Greeting:
Hello, Alice! welcome to the Program.
```

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**Result:**

Thus the Python Program using 'Functions' concepts was successfully executed and output was verified.