Task :- 7

Date :- 08/9/25

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 a list of student grades for a class project. write a python program that statisfies 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 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 reverse sorted list of grades: uses reversed(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.

output:

```
Welcome to the student Grades Analyzer.
Number of students: 4.
Type of student_names 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].
```

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 Students 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 the student names list and.
the grades list.
Print("\n Type of student_names list:", type(student_names))
# 4. Find and print the highest and lowest grade.
highest_grade = MAX(student_grades).
lowest_grade = min(student_grades).
Print("\n 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("\n 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("\n Grade indics 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 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 inputs for operations: The program prompts the user to choose an arithematic operation. (addition, subtraction, multiplication, division).
4. perform operation: Based on the user's choice the program performs the choosen arithmetic operation 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)
     """ Return the quotient of two numbers.
Handles division by zero"""
   If b!= 0:
```

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: 2.0

Greeting:

Hello, Alice! Welcome to the program.

```
    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.
# 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 + ("In Greeting:").
Print ( greet (user_name)).
# Run the main function.
if __name__ == "__main__":
  main().
```

Result:- Thus the python program for 'Parameterizing' functions concepts was successfully executed. and the output was verified.

VEL TECH	
EX No.	7
PERFORMANCE (5)	5
RESULT AND ANALYSIS (5)	5
VIVA VOCE (5)	3
RECORD (5)	
TOTAL (20)	13
SIGN WITH DATE	