

4-09-25

Task: 6 Implement various

utilizing 'functions' concepts in Python programming

AIM:-

To write the Python program using 'functions' concepts in Python programming.

6.1:- You are developed 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: 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 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 lists of Grades: uses `sorted()` to sort the grades.
7. Print reversed list of grades: uses `reversed()` to reverse the sorted list and convert it to a list.
8. Generate and Print a range of grade indices: uses `range` to create a list indices from 1 to the number of students.
9. Stop.

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]

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 the student names list and the grades list
```

```
        print("In type of student_name list:", type(student_names))
```

```
        print("Type of student_grades list:", type(student_grades))
```

```
    # 4. Find and 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 lists 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))
```

```
        print("In Grade indices from 1 to number of students:", grade_indices)
```

```
    # Run the analysis
```

```
        analyze_student_grades()
```

Q.1: 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 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

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
```

```
        return a/b
```

```
    else:
```

```
        return "Error: division by zero"
```

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


output :-

Arithmetic operations:

Sum of 10 and 5: 15

Difference between 10 and 5: 5

Product of 10 and 5: 20

Quotient of 10 and 5: 2.0

Greeting:

Hello, Alice! Welcome to the Program.

:(d: o) bbb 9ch

" " " " " " " " " " " "

850 742734

967 204402 (d.p.)

11. "உலகம் முழுவதும் உள்ளவர்களுக்கும்
உலகம் முழுவதும்"

:(d, m) 296

Return the product of two numbers " " " "

[illegible]

: (d, m) 956 756

$\sigma = 1d \ 2i$

210 174056

"Great things are being done"

2018 (approx) 2018

```
""" 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 - CSE	
EX NO.	6
PERFORMANCE (5)	5
RESULT AND ANALYSIS (5)	5
VIVA VOCE (5)	5
RECORD (5)	
TOTAL (20)	
SIGN WITH DATE	25

8

Result:- Thus, the Python program using 'functions' concepts was successfully executed and the output was verified.