

Task 6: Utilizing 'Functions' Concepts in Python Programming

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

Algorithm:

1. Start
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 values in Student-grades
6. Print reversed list sorted list 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 of indices from 1 to the number of students.
9. 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!\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("Type of Student-names list:", type(student_names))
print("Type of Student-grades list:", type(student_grades))

Output:

Welcome to the Student Grade Analysis!

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 indicates from 1 to number of students: [1, 2, 3, 4]

(1) ~~student id~~ student name grade
of student with lowest grade

[{"name": "s1001", "id": "101"}, {"name": "s1002", "id": "102"}] - student with

[{"name": "s1001", "id": "101"}, {"name": "s1002", "id": "102"}] - student with

(~~student id~~, student name, student grade)

student with lowest grade

(~~student id~~, student name, student grade)

(student name, student grade)

(student name, student grade)

(student name, student grade)

#4. find and Print the highest and lowest grade

Highest -grade = max (student -grade)

lowest -grade = min (student -grade)

Print ("in Highest grade:", highest -grade)

Print ("in 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 list of grades sorted in ^{reverse} ascending order

reversed -grades = list (reversed (sorted -grades))

Print ("Reversed grades:", reversed -grades)

#7. Generate and print a range of grade indicates from 1 to the number of students

grade -indicates = list (range (1, num -students + 1))

Print ("in Grade indicates from 1 to number of students:", grade -indicates)

Run the analysis

analyze -student -grades()

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 the following tasks:
addition, subtraction, multiplication, division.

Algorithm:

1. Start
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, sub, mult, div).
4. Perform Operation : Based on the user's choice, the program performs the chosen arithmetic operation using the defined functions.
5. Display Results : The program displays the results of the operation.
6. Stop.

6.2 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.
```

motor's the vehicles name & prints it in bold &
using the static methods class member as
a word contains two separate instances of
class print() & members, members function in static

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 : 2.0000000000000002

Greetings:

Hello Alice! welcome to the program.

```

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"Quotient of {num1} and {num2}: ", divide(num1, num2))

    # Greetings the user
    user_name = "Alice"
    print("\nGreetings!")
    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	15

~~Result: Thus, the Python Program using 'functions' concepts was successfully executed and the output was verified~~