

Task-No:-7. Utilizing Functions' Concepts in python.

7-1 You are developing a small python script to analyze and manipulate a list of student grades for a class project.

Aim:— To Write the python program using functions concepts in python

Programming,
Algorithm:—

1. Start the program
2. Print 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. Print sorted list of grades : Uses sorted () to sort the grades.
6. Print reversed list of grades : Uses reversed () to reverse the sorted list and converts it to a list.
7. Generate and print a range of grade indices: uses range() to create a list of indices from 1 to the number of students.
8. 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(f"\nNumber of Students: {num_students}")

    # 3. Print the type of the student_names list and the grades list
    print(f"\nType of student_names list: {type(student_names)}")
    print(f"\nType 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 ("\\n highest grade:", highest_grade)

Print ("\\n 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 indices 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 tasks:

Algorithm:-

1. Start the program
2. User Input for Numbers: The program prompts the users to enter two numbers.
3. User Input for operation: The program prompts the users to choose an arithmetic operation.
4. Perform operation: Based on the user's choice, the program performs the chosen arithmetic using the defined functions
5. Display Result: The program displays the result of the operation
6. Stop.

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]

7.2 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
```

```
    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 uses 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))~~

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.

O/P

```
Print("Product of {num1} and {num2} : " multiply (num1, num2))
```

```
Print("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 using 'Functions' concepts was successfully executed and the output was verified.

VEL TECH	
EX 146.	7
PERFORMANCE (5)	5
RESULT AND ANALYSIS (5)	5
VIVA VOCE (5)	5
RECORD (5)	
TOTAL (20)	15
SIGN WITH DATE	C.R.DA