

Task 7: utilizing 'functions' concepts in python programming.

Aim:- To write the python program using 'functions' concepts in python Programming.

T-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
2. print a welcome message: Outputs a simple greeting
3. Determine the no. of students: uses len() to find the number of elements in the student-names list.
4. Find and print highest and lowest grades: uses max() and min() to determine the highest and lowest values in student-grades.
5. Find print sorted list of grades: uses sorted() to sort the grades.
6. Generate and print a range of grade indices: uses range() to create a list of indices from 1 to the no. of students.
7. stop.

Program:-

```
def analyze_student_grades():  
    # Sample data  
    student_names = ["Alice", "Bob", "Charlie", "Diana"]  
    student_grades = (85, 72, 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("\\n Type of student-names list: ", type(student_names))  
    print("Type of student-grades list: ", type(student_grades))
```

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]

#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 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 no. of students
grade-indices = list (range (1, num-students + 1))
print ("In 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 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.
4. Perform operation: Based on the user's choice, the

Program performs the chosen arithmetic using the defined functions

5. Display result

6. Stop

Program:

```
def add (a,b):
    """ return the sum of two numbers """
    return a+b

def sub (a,b):
    """ return the difference of two numbers """
    return a-b

def multiply (a,b):
    """ return a*b """

def divide (a,b):
    if b!=0:
        return a/b
    else:
        return "error: Division by zero"

else:
    return "error: Division by zero"

def greet (name):
    return f"Hello, {name}! Welcome to the program!"

def main():
    num1 = 10
    num2 = 5
    print("Arithmetic operations:")
    print(f"sum of {num1} and {num2}: ", add (num1, num2))
    print(f"Sub {num1} and {num2}: ", sub (num1, num2))
    print(f"difference bet {num1} and {num2}: ", multiply (num1, num2))
    print(f"product of {num1} and {num2}: ", divide (num1, num2))
    print(f"Quotient of {num1} and {num2}: ", user_name)
    user_name = "Alice"
    print ("\n Greeting")
```

Output:-

Arithmetic operations

Sum of 10 and 5 is 15

Difference of 10 and 5 is 5

Product of 10 and 5 is 50

Quotient of 10 and 5 is 2.0

errors

Greeting:

Hello, Alice! Welcome to the program.

(Hello) Python

done (exit)

0 = 10

also (quit)

"One of existing - very" is the

"empty set" or "empty" (empty) using (join) (using a) mode

: (return

0) : (end

Test mode

empty set

empty (empty) (empty)

Print (greet (user-name))
if -- name -- = " " - main ()
main()

VELTECH	
EX NO.	
PERFORMANCE (5)	5
RESULT AND ANALYSIS (5)	5
RECORD (5)	5
VIVA VOCE (5)	5
TOTAL (20)	10
SIGN WITH DATE	AD

Result thus, the Python program using 'functions' concepts work successfully showed and the output was verified.