

Task 3: Importing Python modules and packages in python programming

Aim:

To write python demonstrating importing Python modules and packages

You are tasked with developing a modular calculator application in Python. The calculator should support basic arithmetic operations: addition, subtraction, multiplication, and division. Each operation should be implemented in a separate module. Additionally, you should create a main program to handle user input, call the appropriate module, and display the results.

Algorithm:

1. Define functions for addition, subtraction, multiplication, and division.
2. Handle division by zero by raising an error if the divisor is zero.
3. Import the module (mymath) containing these functions.
4. Initialize two numbers (a = 10, b = 5).
5. Call each function using mymath.<function_name>(a, b).
6. Print the results of all operations.

Program:

```
def add(a, b):  
    return a + b  
def subtract(a, b):  
    return a - b  
def multiply(a, b):  
    return a * b  
def divide(a, b):  
    if b == 0:  
        raise ValueError("Cannot divide by zero")  
    return a / b  
  
import mymath  
  
a = 10  
b = 5  
print("Addition:", mymath.add(a, b))  
print("Subtraction:", mymath.subtract(a, b))  
print("Multiplication:", mymath.multiply(a, b))  
print("Division:", mymath.divide(a, b))
```

Output:

```
===== RESTART: C:
Addition: 15
Subtraction: 5
Multiplication: 50
Division: 2.0
```

- a. You are working on a Python project that requires you to perform various mathematical operations and geometric area calculations. To organize your code better, you decide to create a package named mypackage which includes sub packages pack1 and pack 2 with two modules: mathfunctions and areafunctions Demonstrate the use of the functions by performing a few calculations and printing the results.

Algorithm:

1. Create mathfunctions.py module:
2. Create areafunctions.py module:
3. Create __init__.py files in pack1 and pack2:
4. Create main.py:
5. Print the output as expected.

Program:

1. Create the mathfunctions.py module

```
def add(a, b):
    return a + b
def subtract(a, b):
    return a - b
def multiply(a, b):
    return a * b
def divide(a, b):
    if b == 0:
        return "Error! Division by zero."
    return a / b
```
2. Create the areafunctions.py module

```
import math
def circle_area(radius):
```

```

    return math.pi * radius * radius
def rectangle_area(length, width):
    return length * width
def triangle_area(base, height):
    return 0.5 * base * height

```

3. Create `__init__.py` in each package folder (pack1 and pack2)
 from .mathfunctions import add, subtract, multiply, divide
 from .areafunctions import circle_area, rectangle_area, triangle_area
4. Create the main.py file
 from pack import mathfunctions
 from pack import areafunctions
 # Using math functions
 print("Addition:", mathfunctions.add(10, 5))
 print("Subtraction:", mathfunctions.subtract(10, 5))
 print("Multiplication:", mathfunctions.multiply(10, 5))
 print("Division:", mathfunctions.divide(10, 5))
 # Using area functions
 print("Circle Area (radius=7):", areafunctions.circle_area(7))
 print("Rectangle Area (5x10):", areafunctions.rectangle_area(5, 10))
 print("Triangle Area (base=6, height=8):", areafunctions.triangle_area(6, 8))

Output:

```

===== RESTART: C:/Users/91979/Desktop,
Addition: 15
Subtraction: 5
Multiplication: 50
Division: 2.0
Circle Area (radius=7): 153.93804002589985
Rectangle Area (5x10): 50
Triangle Area (base=6, height=8): 24.0

```

Result:

Thus, the program for Importing Python modules and packages was successfully executed and the output was verified.