AI ASSISTED CODING LAB
ASSIGNMENT 13.3

ENROLLMENT NO :2503A51L31

BATCH NO: 20

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Task Description:

#1 – Remove Repetition
Task: Provide AI with the following redundant code and ask it to refactor
Python Code

```
def calculate_area(shape, x, y=0):
if shape == "rectangle":
return x * y
elif shape == "square":
return x * x
elif shape == "circle":
return 3.14 * x * x
```

Expected Output
• Refactored version with dictionary-based dispatch or separate functions.
• Cleaner and modular design.
Task Description #2 – Error Handling in Legacy Code
Task: Legacy function without proper error handling
Python Code

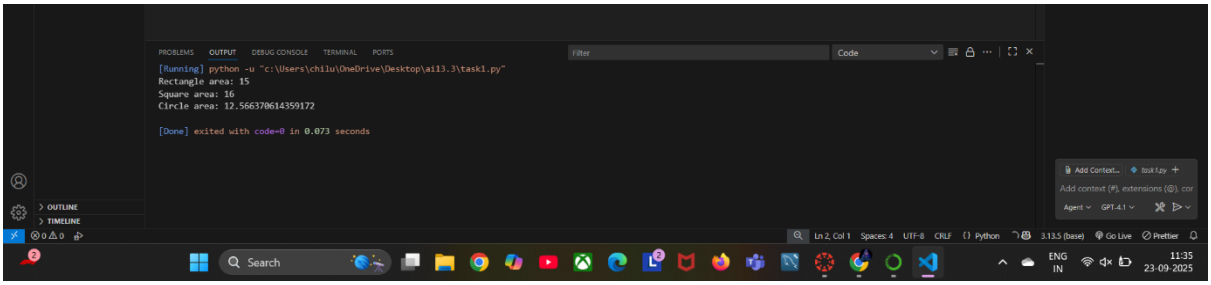
```
def read_file(filename):
f = open(filename, "r")
data = f.read()
```

f.close()
return data

PROMPT: Write a Python program that calculates the area of a rectangle, square, or circle using a function with conditional logic and appropriate mathematical formulas.
Demonstrate the function by printing the area for each shape with sample inputs.

CODE :

OUTPUT:



TASK2:

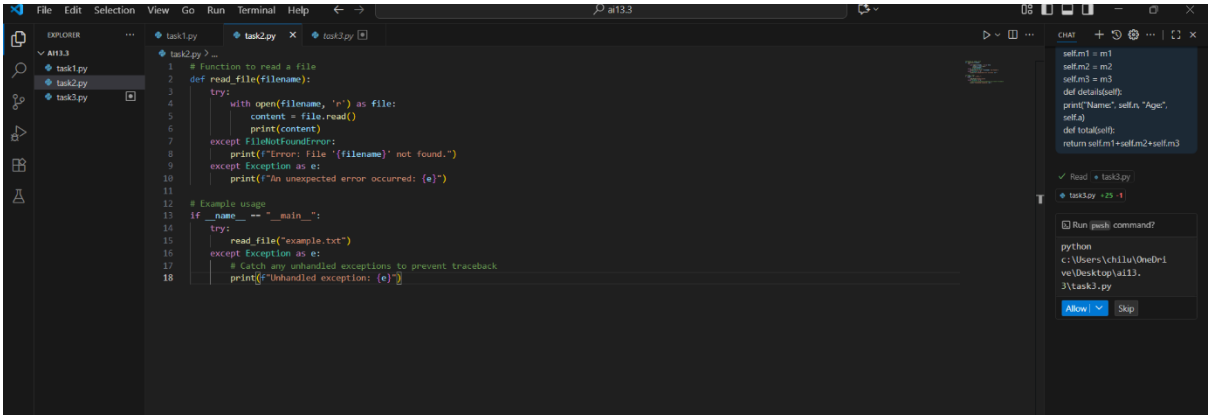
Task Description #2 – Error Handling in Legacy Code
Task: Legacy function without proper error handling
Python Code
def read_file(filename):
f = open(filename, "r")
data = f.read()

f.close()
return data

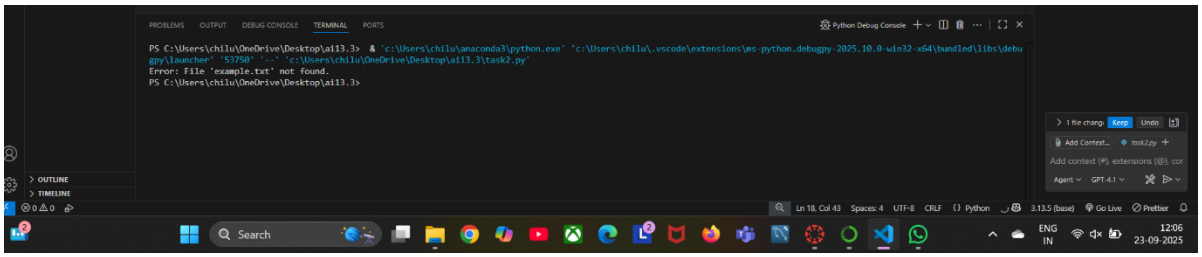
PROMT:

Write a Python program that reads the contents of a file using a function but currently lacks proper error handling.
Update the code to safely handle missing files, read errors, and ensure the file is closed correctly.

CODE:



OUTPUT:

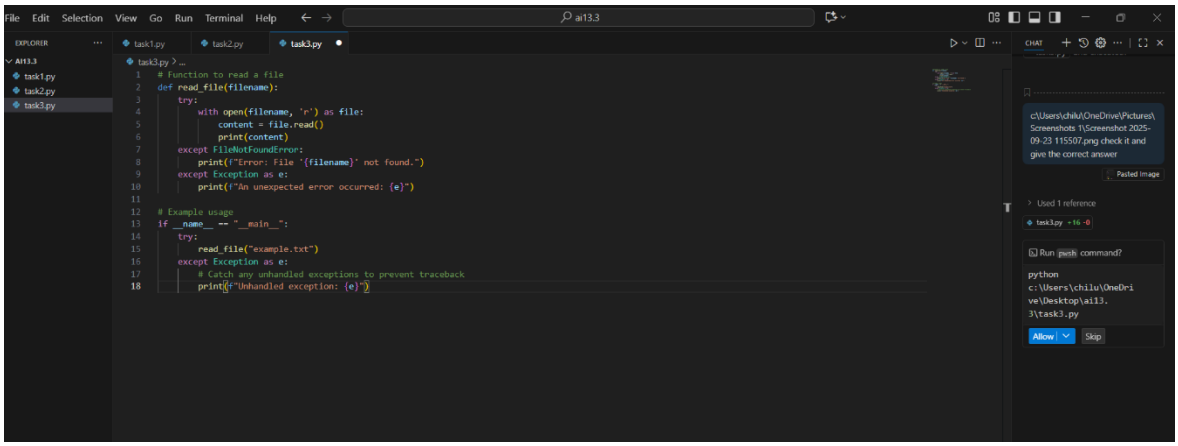


TASK3: ask Description #3 – Complex Refactoring
Task: Provide this legacy class to AI for readability and modularity improvements:
Python Code
class Student:
def __init__(self, n, a, m1, m2, m3):
self.n = n
self.a = a
self.m1 = m1
self.m2 = m2
self.m3 = m3
def details(self):
print("Name:", self.n, "Age:", self.a)
def total(self):
return self.m1+self.m2+self.m3

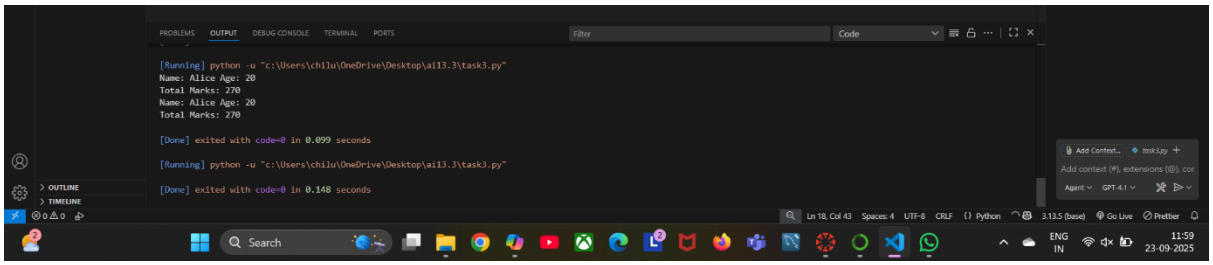
PROMPT:

Refactor a legacy Python class Student to improve readability and modularity. Enhance naming conventions, structure methods clearly, and make the code easier to maintain while preserving its functionality for storing details and calculating total marks.

CODE:



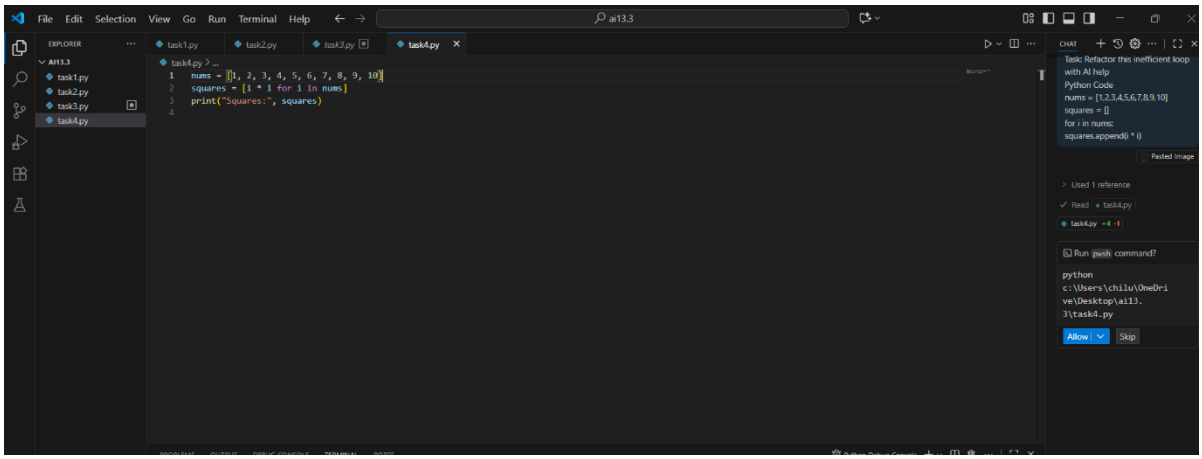
OUTPUT:



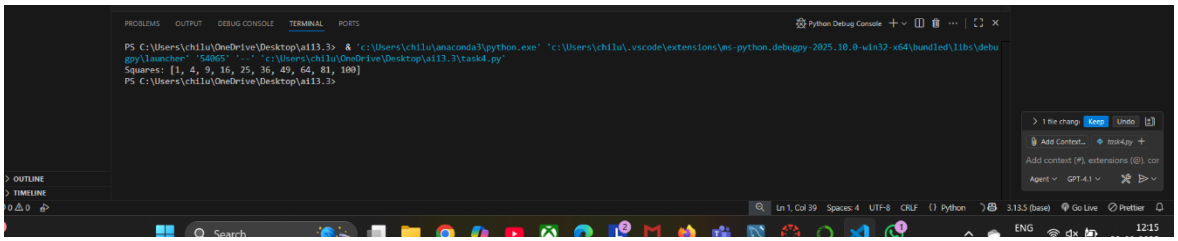
TASK4:

Task Description #4 – Inefficient Loop Refactoring
Task: Refactor this inefficient loop with AI help
Python Code
nums = [1,2,3,4,5,6,7,8,9,10]
squares = []
for i in nums:
squares.append(i * i)
PROMPT:
Refactor a Python program that generates the squares of numbers in a list using an inefficient loop.
Optimize the code by using a more concise and efficient approach such as a list comprehension.

CODE:



OUTPUT:



OBSERVATION:

The experiment demonstrates how AI can effectively **analyze and refactor legacy Python code** to improve **readability, efficiency, and maintainability**.
Across all tasks, AI successfully:

1. **Removed Repetition (Task 1)** – Suggested **dictionary-based dispatch** or separate functions to eliminate repetitive conditional statements, making the calculate_area function cleaner and modular.
2. **Enhanced Error Handling (Task 2)** – Replaced manual file handling with **with open() context manager** and added **try-except blocks**, ensuring safer execution and proper resource management.
3. **Improved Class Design (Task 3)** – Recommended **clearer naming conventions**, added **docstrings**, and proposed storing marks in a list with sum() for better scalability and readability.
4. **Optimized Loop (Task 4)** – Converted the inefficient for loop to a **list comprehension**, making the code shorter, faster, and more Pythonic.