SCHOOLOFCOMPUTER SCIENCE AND ARTIFICIAL INTELLIGENCE		DEPARTMENTOFCOMPUTER SCIENCE ENGINEERING	
ProgramName:B. Tech		**AssignmentType: Lab**	**AcademicYear:**2025-2026
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CourseCode	24CS002PC215	**CourseTitle**	AI Assisted Coding
Year/Sem	II/I	**Regulation**	R24
DateandDay of Assignment	Week7 - WednesDay	**Time(s)**	
Duration	2 Hours	**Applicableto Batches**	
AssignmentNumber:13.3(Presentassignmentnumber)/**24**(Totalnumberofassignments)			

Q.No.	Question	*ExpectedTime to complete*
1	**Lab 13 – Code Refactoring: Improving Legacy Code with AI Suggestions** **Lab Objectives** • To introduce the concept of code refactoring and why it matters	Week5 - Monday

(readability, maintainability, performance).

- To practice using AI tools for identifying and suggesting improvements in legacy code.
- To evaluate the before vs. after versions for clarity, performance, and correctness.
- To reinforce responsible AI-assisted coding practices (avoiding over-reliance, validating outputs).

Learning Outcomes

After completing this lab, students will be able to:

1. Use AI to analyze and refactor poorly written Python code.
2. Improve code **readability, efficiency, and error handling**.
3. Document AI-suggested improvements through comments and explanations.
4. Apply refactoring strategies without changing functionality.
5. Critically reflect on AI's refactoring suggestions.

Task Description #1 – Remove Repetition

Task: Provide AI with the following redundant code and ask it to refactor

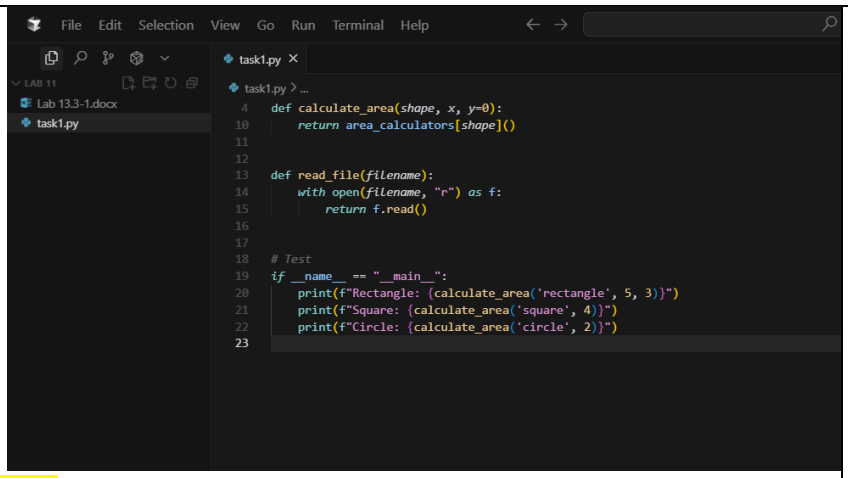
Python Code

```
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
```

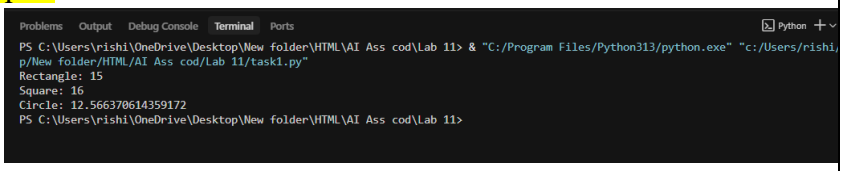
Expected Output

- Refactored version with dictionary-based dispatch or separate functions.
- Cleaner and modular design.

Code :



- Output:



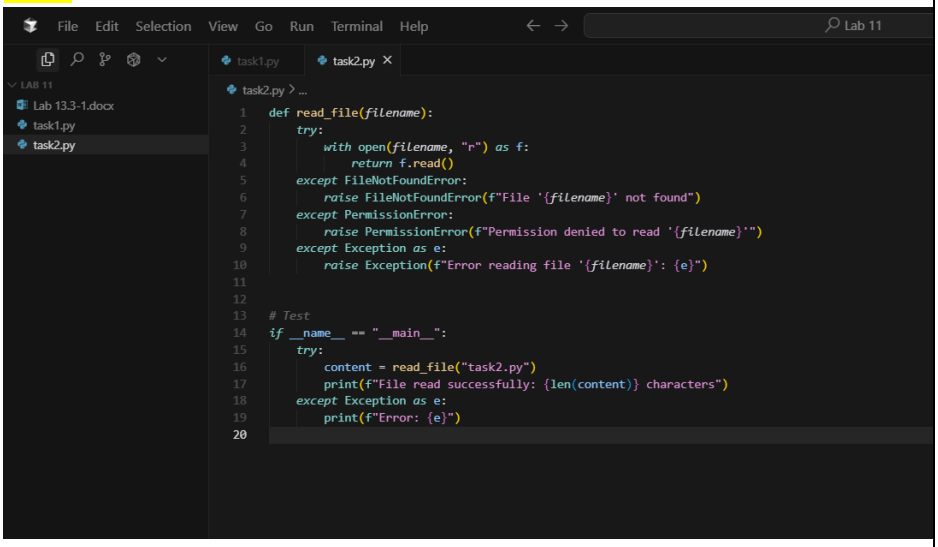
Task Description #2 – Error Handling in Legacy Code
Task: Legacy function without proper error handling

Python Code

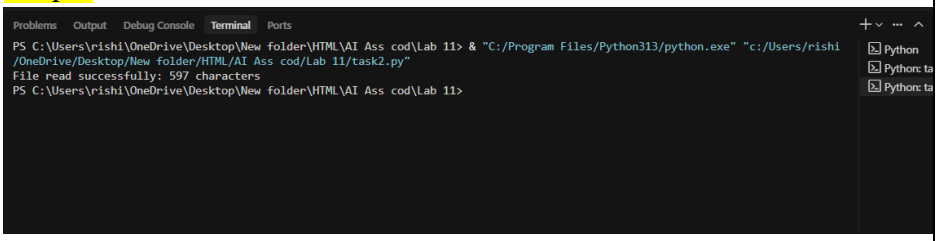
```
def read_file(filename):
    f = open(filename, "r")
    data = f.read()
    f.close()
    return data
```

Expected Output:
AI refactors with with open() and try-except:

Code:



Output:



Task Description #3 – Complex Refactoring

Task: Provide this legacy class to AI for readability and modularity improvements:

Python Code

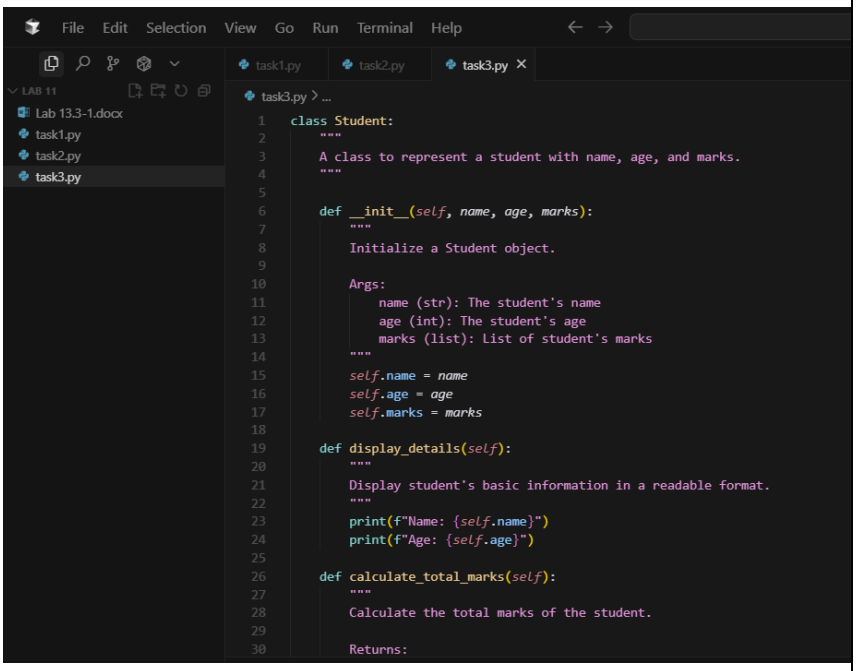
```
class Student:
    def __init__(self, n, a, m1, m2, m3):
        self.n = n
        self.a = a
        self.m1 = m1
        self.m2 = m2
        self.m3 = m3
    def details(self):
        print("Name:", self.n, "Age:", self.a)
    def total(self):
```

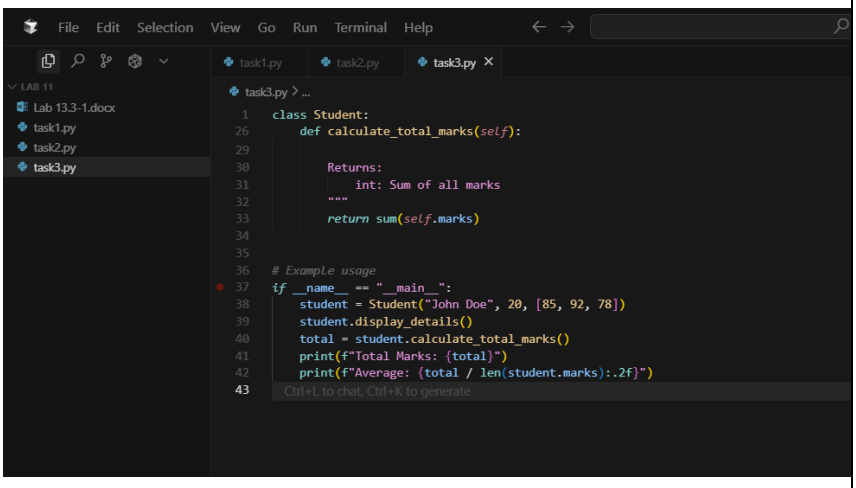
return self.m1+self.m2+self.m3

Expected Output:

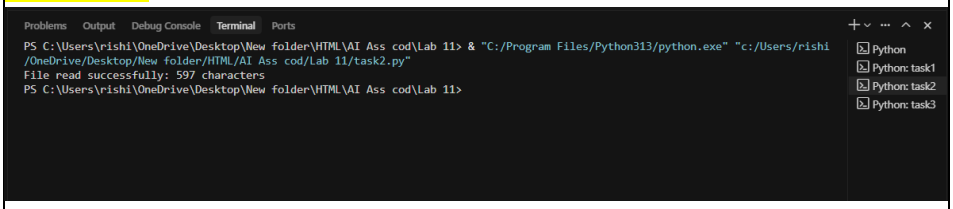
- AI improves naming (`name`, `age`, `marks`).
- Adds docstrings.
- Improves print readability.
- Possibly uses `sum(self.marks)` if marks stored in a list.

CODE:





OUTPUT:



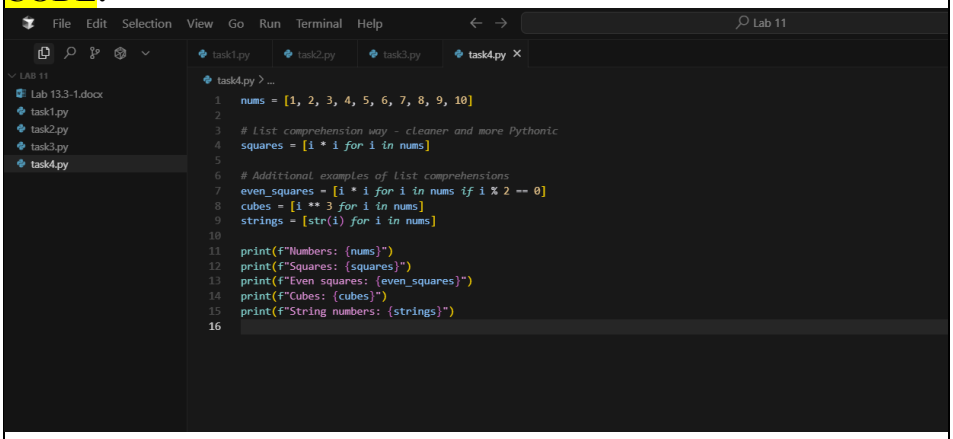
Task Description #4 – Inefficient Loop Refactoring
Task: Refactor this inefficient loop with AI help

Python Code

```
nums = [1,2,3,4,5,6,7,8,9,10]
squares = []
for i in nums:
    squares.append(i * i)
```

Expected Output: AI suggested a **list comprehension**

CODE:



OUTPUT: