SCHOOL OF COMPUTER SCIENCE AND ARTIFICIAL INTELLIGENCE	DEPARTMENT OF COMPUTER SCIENCE ENGINEERING

Program Name: B. Tech	**Assignment Type: Lab**	**Academic Year:**2025-2026

Course Coordinator Name	Venkataramana Veeramsetty		
Instructor(s) Name	Dr. V. Venkataramana (Co-ordinator) Dr. T. Sampath Kumar Dr. Pramoda Patro Dr. Brij Kishor Tiwari Dr.J.Ravichander Dr. Mohammand Ali Shaik Dr. Anirodh Kumar Mr. S.Naresh Kumar Dr. RAJESH VELPULA Mr. Kundhan Kumar Ms. Ch.Rajitha Mr. M Prakash Mr. B.Raju Intern 1 (Dharma teja) Intern 2 (Sai Prasad) Intern 3 (Sowmya) NS_2 (Mounika)		
Course Code	24CS002PC215	**Course Title**	AI Assisted Coding
Year/Sem	II/I	**Regulation**	R24
Date and Day of Assignment	Week7 - Thursday	**Time(s)**	
Duration	2 Hours	**Applicable to Batches**	
AssignmentNumber:13.1(Present assignment number)/**24**(Total number of assignments)			

Q.No.	**Question**	***Expected Time to complete***
1	**Lab 13: Code Refactoring – Improving Legacy Code with AI Suggestions** **Lab Objectives:** • Identify code smells and inefficiencies in legacy Python scripts. • Use AI-assisted coding tools to **refactor** for readability,	Week7 - Thursday

maintainability, and performance.

- Apply **modern Python best practices** while ensuring output correctness.

Task 1

- **Task:** Refactor repeated loops into a cleaner, more Pythonic approach.

Instructions:

- Analyze the legacy code.
- Identify the part that uses loops to compute values.
- Refactor using **list comprehensions** or helper functions while keeping the output the same.

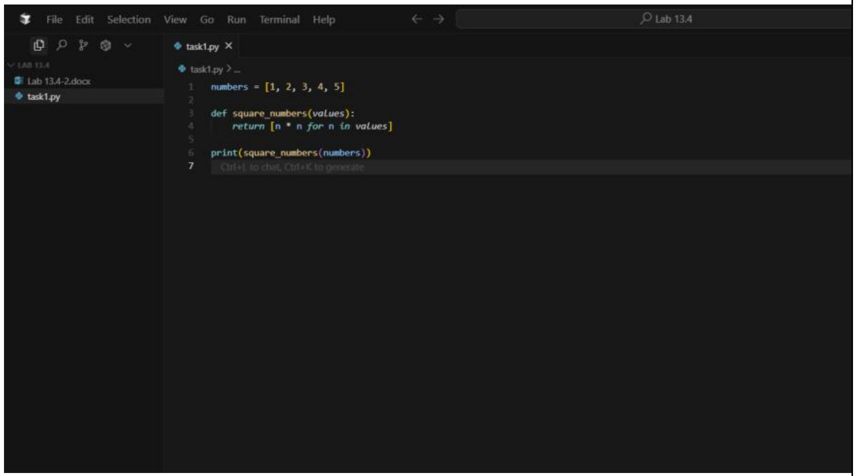
Legacy Code:

```
numbers = [1, 2, 3, 4, 5]
squares = []
for n in numbers:
    squares.append(n ** 2)
print(squares)
```

Expected Output:

```
[1, 4, 9, 16, 25]
```

CODE:

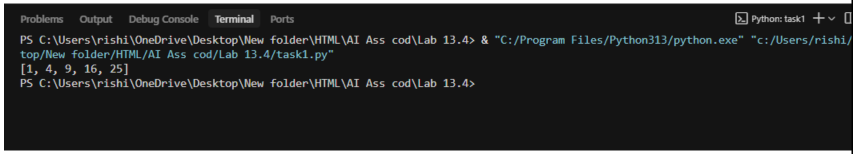


```
numbers = [1, 2, 3, 4, 5]

def square_numbers(values):
    return [n * n for n in values]

print(square_numbers(numbers))
```

Output



```
PS C:\Users\rishi\OneDrive\Desktop\New folder\HTML\AI Ass cod\Lab 13.4> & "C:/Program Files/Python313/python.exe" "c:/Users/rishi/
top/New folder/HTML/AI Ass cod/Lab 13.4/task1.py"
[1, 4, 9, 16, 25]
PS C:\Users\rishi\OneDrive\Desktop\New folder\HTML\AI Ass cod\Lab 13.4>
```

Task 2

Task: Simplify string concatenation.

Instructions:

- Review the loop that builds a sentence using +=.
- Refactor using " ".join() to improve efficiency and readability.

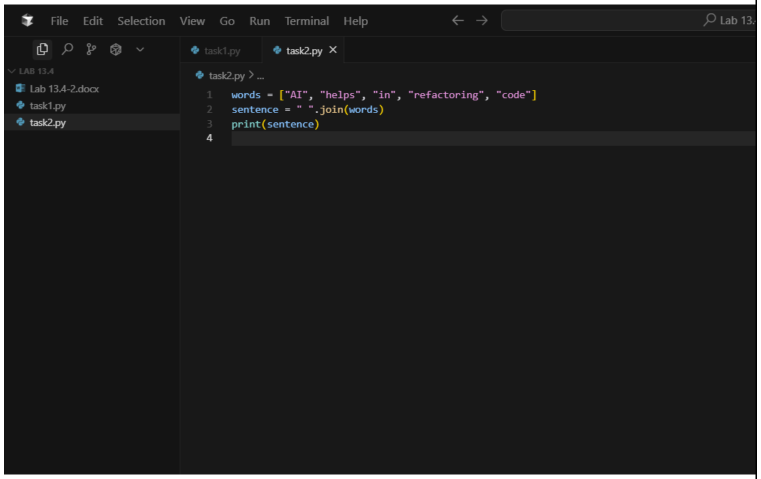
Legacy Code:

```
words = ["AI", "helps", "in", "refactoring", "code"]
sentence = ""
for word in words:
    sentence += word + " "
print(sentence.strip())
```

Expected Output:

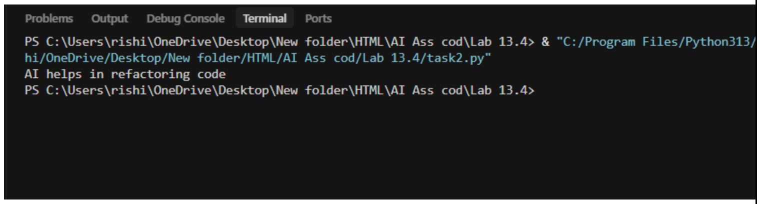
AI helps in refactoring code

- Code



```
words = ["AI", "helps", "in", "refactoring", "code"]
sentence = " ".join(words)
print(sentence)
```

Output



```
PS C:\Users\rishi\OneDrive\Desktop\New folder\HTML\AI Ass cod\Lab 13.4> & "C:/Program Files/Python313/
hi/OneDrive/Desktop/New folder/HTML/AI Ass cod/Lab 13.4/task2.py"
AI helps in refactoring code
PS C:\Users\rishi\OneDrive\Desktop\New folder\HTML\AI Ass cod\Lab 13.4>
```

Task 3

Task: Replace manual dictionary lookup with a safer method.

Instructions:

- Check how the code accesses dictionary keys.
- Use .get() or another Pythonic approach to handle missing keys gracefully.

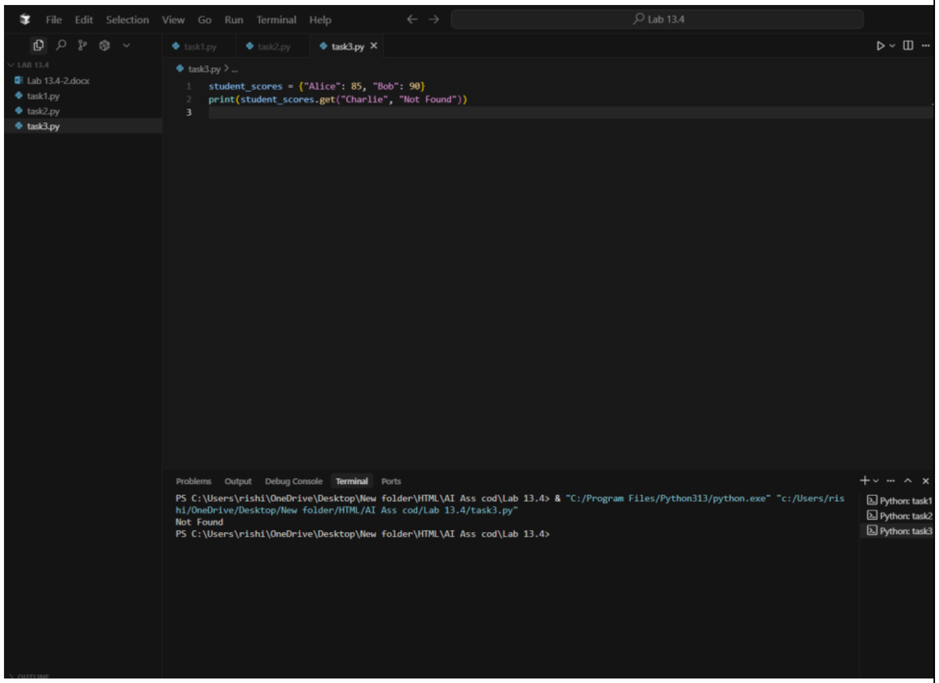
Legacy Code:

```
student_scores = {"Alice": 85, "Bob": 90}
if "Charlie" in student_scores:
    print(student_scores["Charlie"])
else:
    print("Not Found")
```

Expected Output:

```
Not Found
```

Code within the output



```
student_scores = {"Alice": 85, "Bob": 90}
print(student_scores.get("Charlie", "Not Found"))
```

```
PS C:\Users\rishi\OneDrive\Desktop\New folder\HTML\AI Ass cod\Lab 13.4> & "C:/Program Files/Python313/python.exe" "c:/Users/ris
hi/OneDrive/Desktop/New folder/HTML/AI Ass cod/Lab 13.4/task3.py"
Not Found
PS C:\Users\rishi\OneDrive\Desktop\New folder\HTML\AI Ass cod\Lab 13.4>
```

Task 4

Task: Refactor repetitive if-else blocks.

Instructions:

- Examine multiple if-elif statements for operations.
- Refactor using **dictionary mapping** to make the code scalable and clean.

Legacy Code:

```
operation = "multiply"
a, b = 5, 3

if operation == "add":
    result = a + b
```

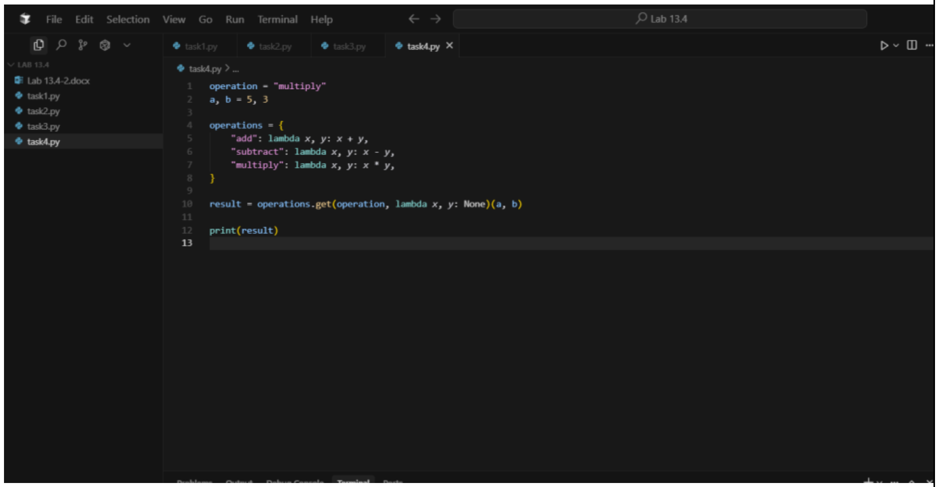
```
elif operation == "subtract":
    result = a - b
elif operation == "multiply":
    result = a * b
else:
    result = None

print(result)
```

Expected Output:

15

code



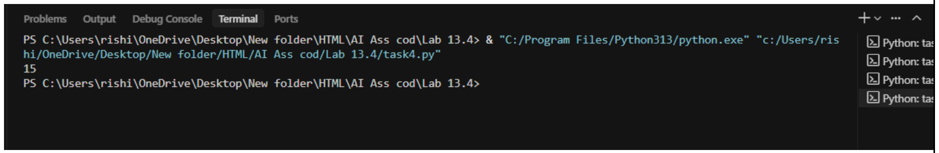
```python
operation = "multiply"
a, b = 5, 3

operations = {
    "add": lambda x, y: x + y,
    "subtract": lambda x, y: x - y,
    "multiply": lambda x, y: x * y,
}

result = operations.get(operation, lambda x, y: None)(a, b)

print(result)
```

output



```
PS C:\Users\rishi\OneDrive\Desktop\New folder\HTML\AI Ass cod\Lab 13.4> & "C:/Program Files/Python313/python.exe" "c:/Users/ris
hi/OneDrive/Desktop/New folder/HTML/AI Ass cod/Lab 13.4/task4.py"
15
PS C:\Users\rishi\OneDrive\Desktop\New folder\HTML\AI Ass cod\Lab 13.4>
```

Task 5

Task: Optimize nested loops for searching.

Instructions:

- Identify the nested loop used to find an element.
- Refactor using Python's in keyword or other efficient search techniques.

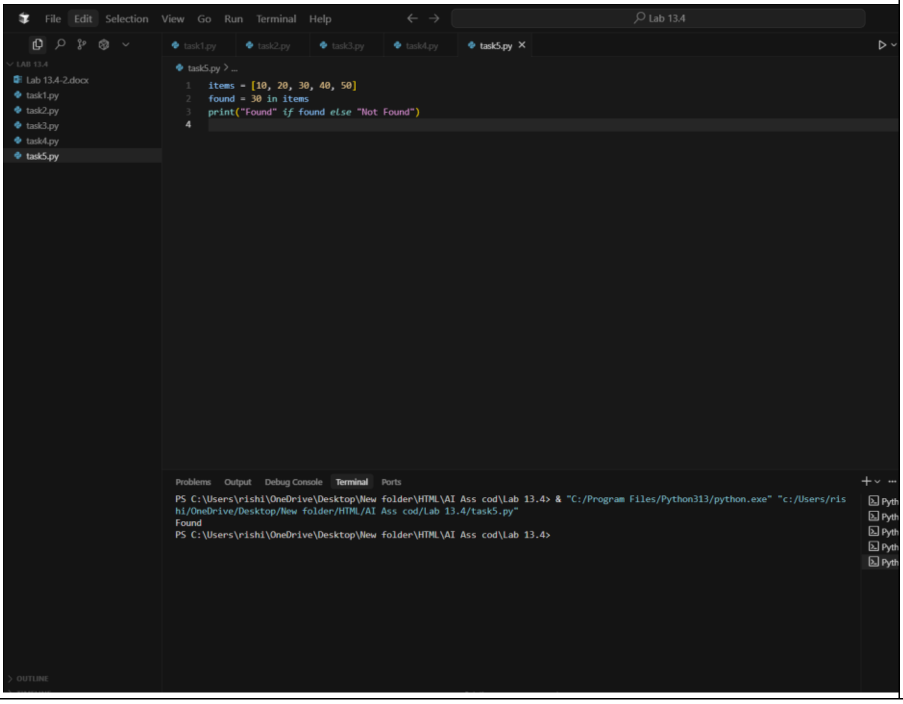
Legacy Code:

```
items = [10, 20, 30, 40, 50]
found = False
for i in items:
    if i == 30:
        found = True
        break
print("Found" if found else "Not Found")
```

Expected Output:

```
Found
```

Code and output:



```
items = [10, 20, 30, 40, 50]
found = 30 in items
print("Found" if found else "Not Found")
```

```
PS C:\Users\rishi\OneDrive\Desktop\New folder\HTML\AI Ass cod\Lab 13.4> & "C:/Program Files/Python313/python.exe" "c:/Users/rishi/OneDrive/Desktop/New folder/HTML/AI Ass cod/Lab 13.4/task5.py"
Found
PS C:\Users\rishi\OneDrive\Desktop\New folder\HTML\AI Ass cod\Lab 13.4>
```