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

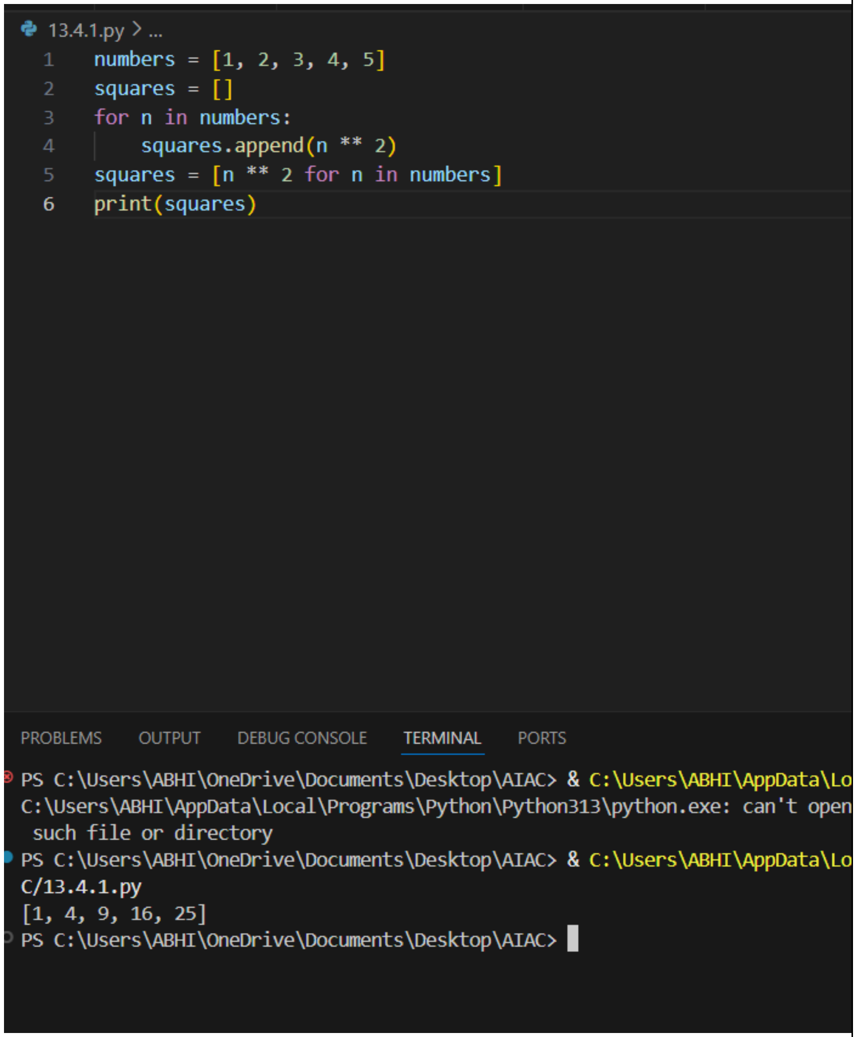
maintainability, and performance.
- Apply **modern Python best practices** while ensuring output correctness.

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]
```

PROMPT: Refactor using **list comprehensions** or helper functions while keeping the output the same



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

```
PS C:\Users\ABHI\OneDrive\Documents\Desktop\AIAC> & C:\Users\ABHI\AppData\Lo
C:\Users\ABHI\AppData\Local\Programs\Python\Python313\python.exe: can't open
 such file or directory
PS C:\Users\ABHI\OneDrive\Documents\Desktop\AIAC> & C:\Users\ABHI\AppData\Lo
C/13.4.1.py
[1, 4, 9, 16, 25]
PS C:\Users\ABHI\OneDrive\Documents\Desktop\AIAC> 
```

Task 2

Task: Simplify string concatenation.

Instructions:

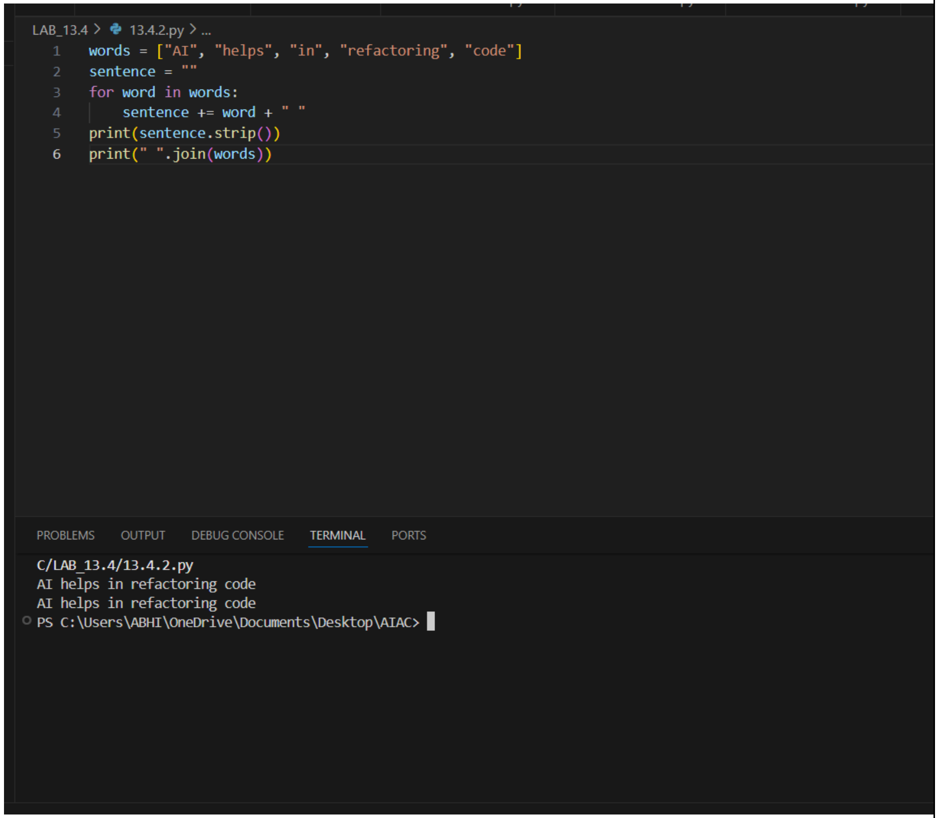
- Review the loop that builds a sentence using +=.
- Refactor using " ".join() to improve efficiency and readability.

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

PROMPT: Refactor using " ".join() to improve efficiency and readability.



```
LAB_13.4 > 13.4.2.py > ...
words = ["AI", "helps", "in", "refactoring", "code"]
sentence = ""
for word in words:
    sentence += word + " "
print(sentence.strip())
print(" ".join(words))
```

```
C/LAB_13.4/13.4.2.py
AI helps in refactoring code
AI helps in refactoring code
PS C:\Users\ABHI\OneDrive\Documents\Desktop\AIAC>
```

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Task 3

Task: Replace manual dictionary lookup with a safer method.

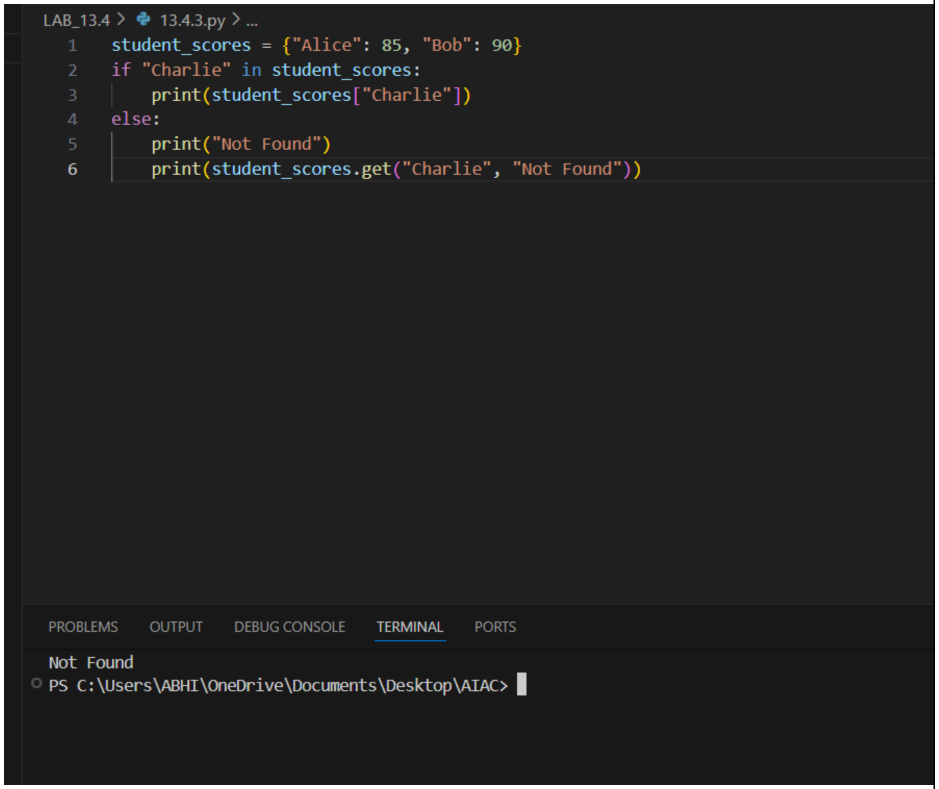
Instructions:

- 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

	PROMPT: Use .get() or another Pythonic approach to handle missing keys gracefully.
	
	LAB_13.4 > 13.4.3.py > ...
	`student_scores = {"Alice": 85, "Bob": 90}`
	`if "Charlie" in student_scores:`
	`    print(student_scores["Charlie"])`
	`else:`
	`    print("Not Found")`
	`    print(student_scores.get("Charlie", "Not Found"))`
	PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
	`Not Found`
	`PS C:\Users\ABHI\OneDrive\Documents\Desktop\AIAC>`	

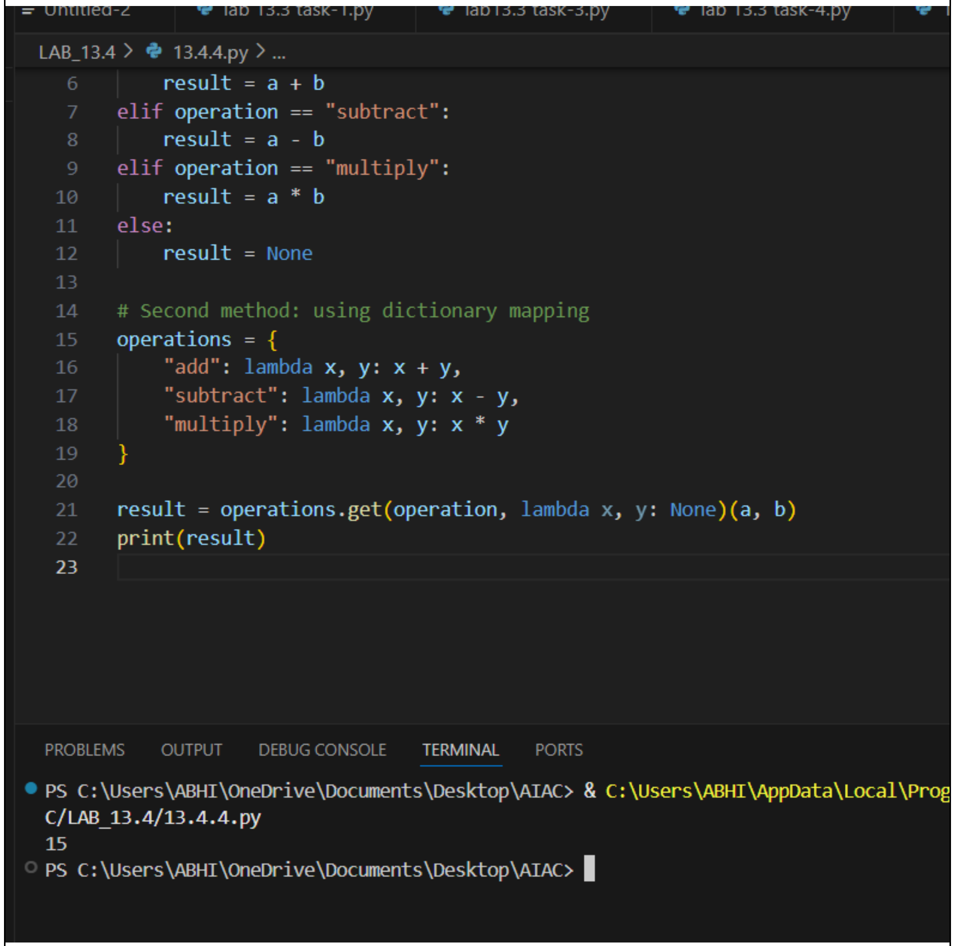
	Task 4
	Task: Refactor repetitive if-else blocks.
	Instructions:
	• Examine multiple if-elif statements for operations.
	• Refactor using **dictionary mapping** to make the code scalable and clean.
	Legacy Code:
	operation = "multiply"
	a, b = 5, 3
	
	if operation == "add":
	    result = a + b
	elif operation == "subtract":
	    result = a - b
	elif operation == "multiply":
	    result = a * b
	else:
	    result = None	

print(result)

Expected Output:

15

PROMPT: Refactor using **dictionary mapping** to make the code scalable and clean



LAB_13.4 > 13.4.4.py > ...

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

    # Second method: using dictionary mapping
    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)
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
PS C:\Users\ABHI\OneDrive\Documents\Desktop\AIAC> & C:\Users\ABHI\AppData\Local\Prog
C/LAB_13.4/13.4.4.py
15
PS C:\Users\ABHI\OneDrive\Documents\Desktop\AIAC>
```

Task 5

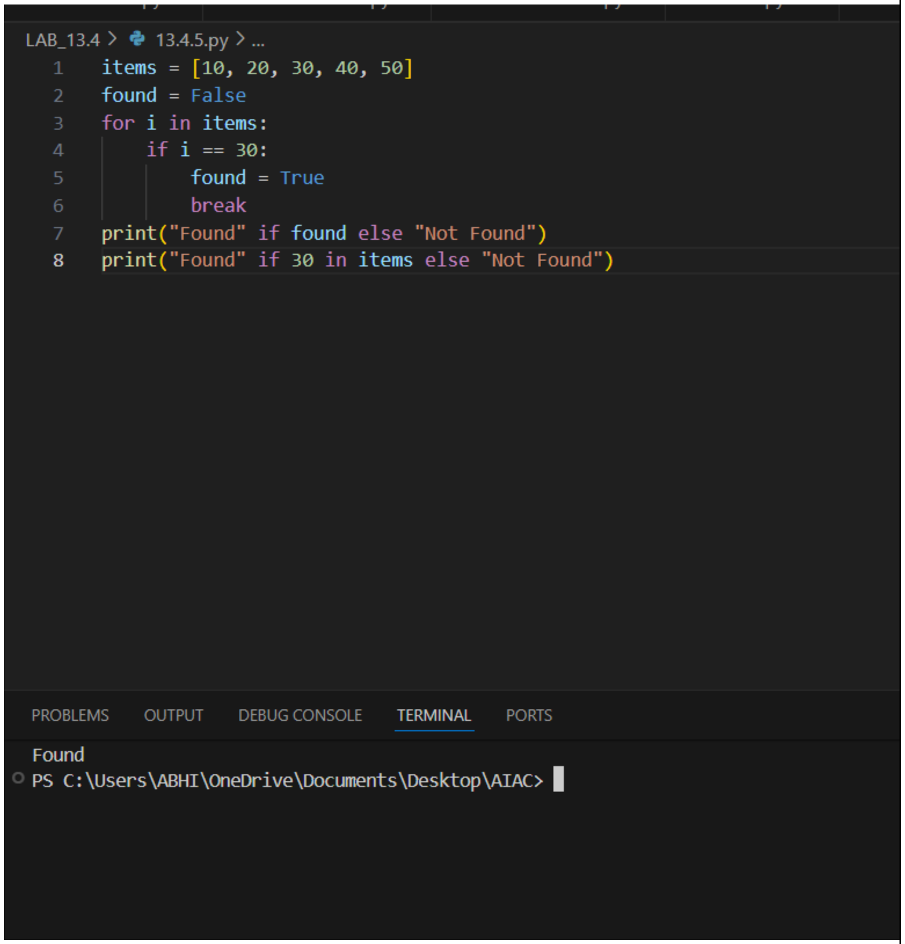
Task: Optimize nested loops for searching.

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
	
	PROMPT: Refactor using Python's in keyword or other efficient search techniques.
	
	LAB_13.4 > 13.4.5.py > ...
	`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")`
	`print("Found" if 30 in items else "Not Found")`
	
	`Found`
	`PS C:\Users\ABHI\OneDrive\Documents\Desktop\AIAC>`	