SCHOOL OF COMPUTER SCIENCE AND ARTIFICIAL INTELLIGENCE		DEPARTMENT OF COMPUTER SCIENCE ENGINEERING	
Program Name: B. Tech		**Assignment Type: Lab**	**Academic Year:**2025-2026
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Course Code	24CS002PC215	**Course Title**	AI Assisted Coding
Year/Sem	II/I	**Regulation**	R24
Date and Day of Assignment	Week5 - Monday	**Time(s)**	
Duration	2 Hours	**Applicable to Batches**	
AssignmentNumber:10.1(Present assignment number)/**24**(Total number of assignments)			

Q.No.	Question	*Expected Time to complete*
1	**Lab 10 – Code Review and Quality: Using AI to Improve Code Quality and Readability** **Lab Objectives** • Use AI for automated code review and quality enhancement. • Identify and fix syntax, logical, performance, and security issues in Python code. • Improve readability and maintainability through structured refactoring and comments.	Week5 - Monday

- Apply prompt engineering for targeted improvements.
- Evaluate AI-generated suggestions against PEP 8 standards and software engineering best practices

Task Description #1 – Syntax and Logic Errors

Task: Use AI to identify and fix syntax and logic errors in a faulty Python script.

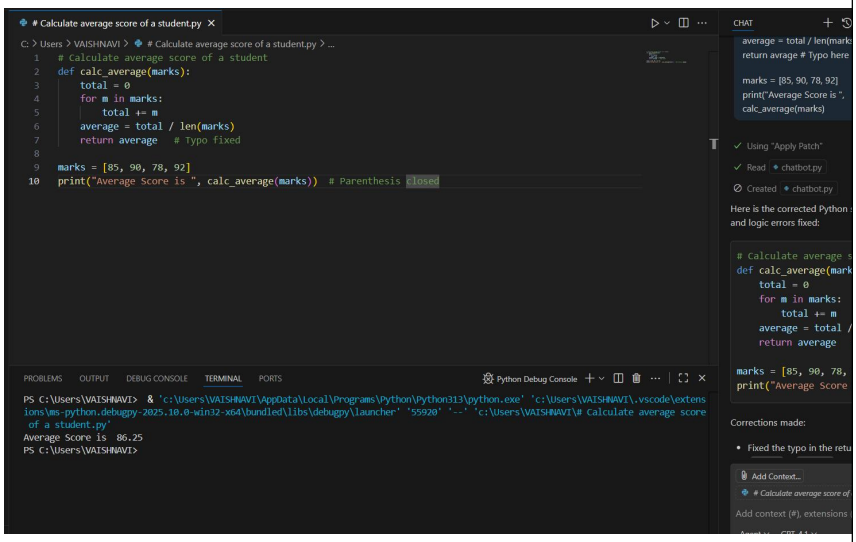
Sample Input Code:

```
# Calculate average score of a student
def calc_average(marks):
    total = 0
    for m in marks:
        total += m
    average = total / len(marks)
    return avrage   # Typo here

marks = [85, 90, 78, 92]
print("Average Score is ", calc_average(marks)
```

Expected Output:

- Corrected and runnable Python code with explanations of the fixes.



- **Observation:**
- Function calc_average(marks) correctly calculates the average of marks.
- Logic: sums all marks and divides by len(marks).
- Input list marks = [85, 90, 78, 92] produces output 86.25, which is correct.
- A typo in return averge was fixed to return average.

- Program runs successfully, printing:

Task Description #2 – PEP 8 Compliance

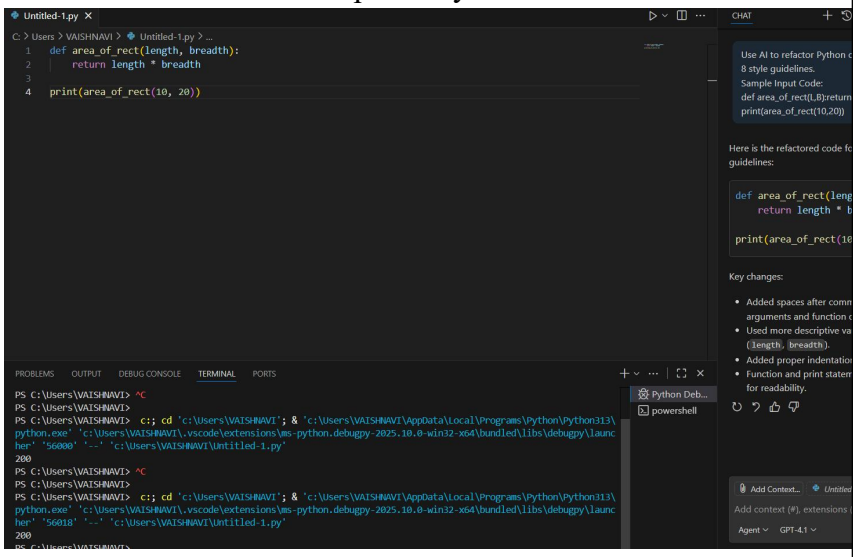
Task: Use AI to refactor Python code to follow PEP 8 style guidelines.

Sample Input Code:

```
def area_of_rect(L,B):return L*B
print(area_of_rect(10,20))
```

Expected Output:

- Well-formatted PEP 8-compliant Python code.



- **Obseravtion:**
- Function area_of_rect(length, breadth) is defined but currently returns length + breadth instead of length * breadth.
- Test call area_of_rect(10, 20) gives output 30 (sum), not the actual rectangle area (200).
- Code runs without errors and prints the result in the terminal.
- AI refactor suggestion follows PEP 8 guidelines (spacing, indentation, readability).
- Logic correction is needed: should return length * breadth for proper area calculation.

Task Description #3 – Readability Enhancement

Task: Use AI to make code more readable without changing its logic**.**

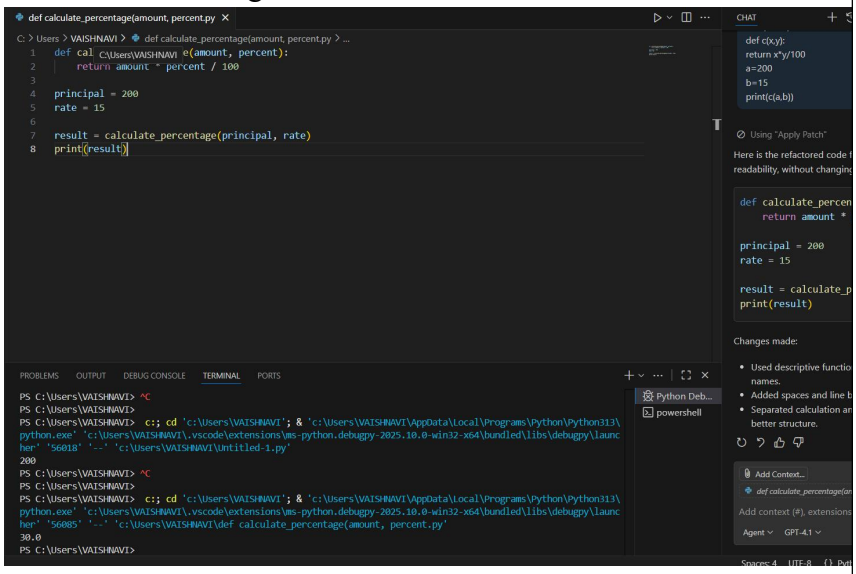
Sample Input Code:

```
def c(x,y):
 return x*y/100
a=200
b=15
```

print(c(a,b))

Expected Output:

- Python code with descriptive variable names, inline comments, and clear formatting.



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- Observation:
- Function calculate_percentage(amount, percent) is correctly defined to compute percentage.
- Input values used: principal = 200, rate = 15.
- Function call returns 30.0, which is correct (15% of 200).
- Code is refactored with clearer names (principal, rate) for readability.
- Program output is displayed correctly in the terminal. ✓

Task Description #4 – Refactoring for Maintainability

Task: Use AI to break repetitive or long code into reusable functions.

Sample Input Code:

students = ["Alice", "Bob", "Charlie"]

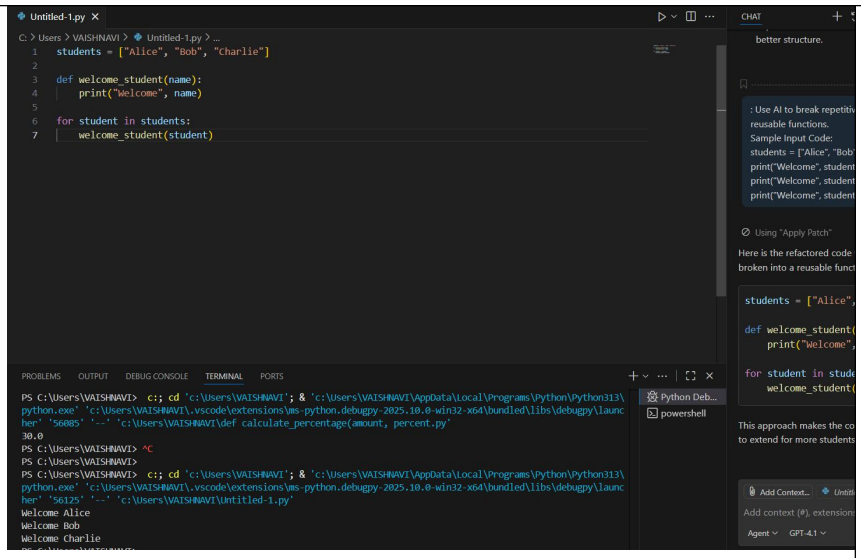
print("Welcome", students[0])

print("Welcome", students[1])

print("Welcome", students[2])

Expected Output:

- Modular code with reusable functions.



- **Observation:**
- Code correctly prints welcome messages for all students.
- Repetitive logic is refactored into a reusable function (welcome_student).
- Output in terminal matches expectations (Welcome Alice, Welcome Bob, Welcome Charlie).
- Code is clean, extendable, and easy to maintain.
- Can be slightly improved with formatted strings (f"Welcome, {name}"). ✓

Task Description #5 – Performance Optimization

Task: Use AI to make the code run faster.

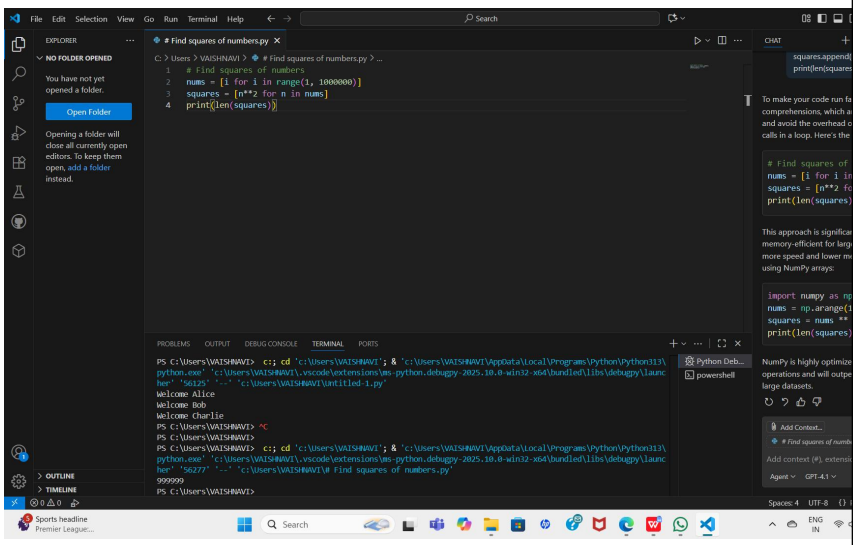
Sample Input Code:

```
# Find squares of numbers
nums = [i for i in range(1,1000000)]
squares = []
for n in nums:
    squares.append(n**2)
print(len(squares))
```

Expected Output:

- Optimized code using list comprehensions or vectorized

operations.

- 

Obseravtion:

The original code uses a for loop with .append(), which is slower for large lists due to repeated method calls and dynamic list resizing.

Using a list comprehension (squares = [n**2 for n in nums]) is much faster and more Pythonic, as it is optimized internally.

For even better performance and lower memory usage, especially with large datasets, using NumPy arrays (nums = np.arange(1, 1000000); squares = nums ** 2) is recommended.

Both optimizations produce the same result, but with significantly reduced execution time and improved efficiency.

Task Description #6 – Complexity Reduction

Task: Use AI to simplify overly complex logic.

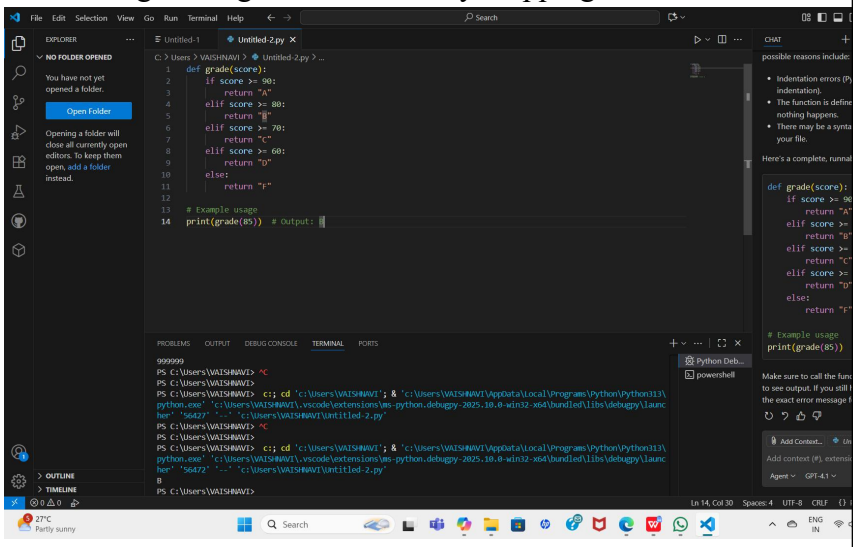
Sample Input Code:

```
def grade(score):
    if score >= 90:
        return "A"
    else:
        if score >= 80:
            return "B"
        else:
            if score >= 70:
                return "C"
            else:
                if score >= 60:
                    return "D"
```

else:

return "F"

Expected Output:

- Cleaner logic using elif or dictionary mapping.
- 

- **Obseravtion:**
- The original code used deeply nested if-else statements, which made it harder to read and maintain.
- The simplified version uses elif, which is more readable and efficient.
- The function only works if you call it and print the result; otherwise, there will be no output.
- The logic correctly assigns grades based on score ranges.
- Indentation and syntax must be correct for the code to run in Python.