

AI ASSISTANT CODING

Assignment – 2.5

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Batch – 03

Task 1: Refactoring Odd/Even Logic (List Version)

❖ Scenario:

You are improving legacy code.

❖ Task:

Write a program to calculate the sum of odd and even numbers in a list,

then refactor it using AI.

❖ Expected Output:

❖ Original and improved code

The screenshot shows the VS Code interface with the task1.py file open. The code is divided into two sections: 'Original Code (Legacy Style)' and 'Improved/Refactored Code'. The 'Original Code' section contains a while loop that iterates through a list of numbers, adding odd or even numbers to separate sums based on their index. The 'Improved/Refactored Code' section shows a more concise approach using list comprehension to calculate the sums directly from the list.

```
# Task 1: Refactoring Odd/Even Logic (List Version)
# Scenario:
# You are improving Legacy code.
# Write a program to calculate the sum of odd and even numbers in a List,
# then refactor it using AI.
# Expected Output:
# Original and Improved code

# Original Code (Legacy Style)
def calculate_sums_original(numbers):
    odd_sum = 0
    even_sum = 0
    i = 0
    while i < len(numbers):
        if numbers[i] % 2 == 0:
            even_sum = even_sum + numbers[i]
        else:
            odd_sum = odd_sum + numbers[i]
        i = i + 1
    return odd_sum, even_sum

# Test the original code
numbers = [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
odd, even = calculate_sums_original(numbers)
print("Original Code:")
print(f"Sum of odd numbers: {odd}")
print(f"Sum of even numbers: {even}")

# Improved Code (Refactored)
def calculate_sums_improved(numbers):
    """
    Calculate the sum of odd and even numbers in a list.
    """
    odd_sum = sum([x for i, x in enumerate(numbers) if i % 2 == 0])
    even_sum = sum([x for i, x in enumerate(numbers) if i % 2 != 0])
    return odd_sum, even_sum
```

Task 2: Area Calculation Explanation

❖ Scenario:

You are onboarding a junior developer.

❖ Task:

Ask Gemini to explain a function that calculates the area of different

shapes.

❖ Expected Output:

➤ Code

➤ Explanation

The screenshot shows the Gemini Code Assist interface. On the left, there's a sidebar with various sections like 'Hello, Katakam', 'Gemini 3 Flash has been released', 'View docs', 'Tips for getting started', and a 'Build with Agent' section. The main area displays a Python script named 'Fact.py' with the following code:

```

1 def factorial(n):
2     if n == 0 or n == 1:
3         return 1
4     else:
5         return n * factorial(n - 1)
6 num = int(input("Enter a number: "))
7 print("Factorial is:", factorial(num))

```

On the right, there's a 'Build with Agent' panel with a message: 'AI responses may be inaccurate. Generate Agent Instructions to onboard AI onto your codebase.' Below the code editor, the status bar shows 'Source: Gemini Code Assist' and 'Open Settings'.

The screenshot shows the AI-A-coding-v2 interface. The main area displays a Python script named 'test2.py' with the following code:

```

1 print("The area of the rectangle is: (rectangle_area)")
2 circle_area = calculate_area("circle", radius=5)
3 print("The area of the circle is: (circle_area)")
4 triangle_area = calculate_area("triangle", base=8, height=4)
5 print("The area of the triangle is: (triangle_area)")
6
7 # Example of an error
8 square_area = calculate_area("square", side=5)
9 print("The area of the square is: (square_area)")

```

Below the code, there's an 'Explanation' section that provides detailed information about the function's behavior, including handling of different shapes and errors. The status bar at the bottom shows 'Generated by Gemini genie-25 pro'.

Explanation

This Python script defines a single function `calculate_area` that is designed to be a flexible tool for finding the area of several different geometric shapes.

Function Definition:

```
def calculate_area(shape, **kwargs):
```

This defines a function named `calculate_area` that accepts two arguments:

`shape`: A string that tells the function which shape's area to calculate (e.g., "rectangle").

`**kwargs`: This is a special Python feature that allows the function to accept any number of keyword arguments (like `length=10` or `radius=5`). These arguments are collected into a dictionary named `kwargs`. This makes the function adaptable, as different shapes require different parameters for area calculation.

Conditional Logic:

The function uses `if`, `elif` (else if), and `else` statements to determine which shape has been requested and then performs the correct calculation.

`if shape == "rectangle":`

If the shape is a "rectangle", the code checks if the necessary dimensions, `length` and `width`, are provided in the `kwargs` dictionary.

If they are present, it calculates the area by multiplying `length` and `width`.

If they are missing, it returns an error message.

`elif shape == "circle":`

If the shape is a "circle", it checks for a `radius`.

If found, it calculates the area using the formula $\pi * r^2$, importing the `math` module to get an accurate value of `math.pi`.

If the `radius` is missing, it returns an error.

`elif shape == "triangle":`

If the shape is a "triangle", it checks for a `base` and `height`.

If they are present, it calculates the area using the formula $0.5 * base * height$.

If they are missing, it returns an error.

`else:`

If the provided shape name does not match any of the supported shapes ("rectangle", "circle", "triangle"), the function returns an "Unsupported shape" error.

Example Usage:

The lines at the end of the script demonstrate how to use the function and print the results for a rectangle, a circle, a triangle, and an unsupported shape to show how the error handling works.

Task 3: Prompt Sensitivity Experiment

❖ Scenario:

You are testing how AI responds to different prompts.

❖ Task:

Use Cursor AI with different prompts for the same problem and observe code changes.

❖ Expected Output:

➢ Prompt list

➢ Code variations

The screenshot shows the Visual Studio Code (VS Code) interface. At the top, there are several tabs labeled 'task1.py U', 'task1-2.py U', 'task2.py U', and 'task3.py U'. Below the tabs, the main editor area displays a Python script named 'task3.py' with the following code:

```
# Write a Python function to reverse an integer.
def reverse(x):
    sign = 1 if x < 0 else 1
    x = abs(x)
    rev = 0
    while x != 0:
        rev = rev * 10 + x % 10
        x /= 10
    rev *= sign
    if rev < INT_MIN or rev > INT_MAX:
        return 0
    return rev
```

On the right side of the interface, there is a 'Terminal' tab showing command-line history. The history includes:

```
PS E:\sem6\AI-A-coding-v2> & "c:\Python314\python.exe" "c:\Users\spurs\cursor\extensions\es-python.debug-2025.18.0-win32-x64\bundle\libs\debug\launcher" "63870" "-l" "e:\sem6\AI-A-coding-v2\Assessment2.5\task3.py"
9547
PS E:\sem6\AI-A-coding-v2> e; cd "c:\Users\spurs\cursor\extensions\es-python.debug-2025.18.0-win32-x64\bundle\libs\debug\launcher" & "c:\Python314\python.exe" "c:\Users\spurs\cursor\extensions\es-python.debug-2025.18.0-win32-x64\bundle\libs\debug\launcher" "6375" "-l" "e:\sem6\AI-A-coding-v2\Assessment2.5\task3.py"
PS E:\sem6\AI-A-coding-v2> e; cd "c:\Users\spurs\cursor\extensions\es-python.debug-2025.18.0-win32-x64\bundle\libs\debug\launcher" & "c:\Python314\python.exe" "c:\Users\spurs\cursor\extensions\es-python.debug-2025.18.0-win32-x64\bundle\libs\debug\launcher" "62814" "-l" "e:\sem6\AI-A-coding-v2\Assessment2.5\task3.py"
8520
PS E:\sem6\AI-A-coding-v2>
```

The bottom status bar indicates 'Cursor Tab' and shows file paths like 'task1.py lines 1-9' and '21m'.

Task 4: Tool Comparison Reflection

❖ Scenario:

You must recommend an AI coding tool.

❖ Task:

Based on your work in this topic, compare Gemini, Copilot, and Cursor AI for usability and code quality.

❖ **Expected Output:**

Short written reflection

Based on my experience using Gemini, GitHub Copilot, and Cursor AI during this topic, I observed clear differences in both usability and code quality.

Gemini is useful for understanding concepts and generating explanations, but it often produces generic code unless very strict constraints are provided. It is better suited for learning and problem understanding rather than competitive or production-level coding.

GitHub Copilot integrates smoothly with IDEs like VS Code and provides fast, context-aware code suggestions. However, its outputs sometimes assume the developer will handle edge cases, so overflow handling and constraints may be missed unless explicitly guided.

Cursor AI provided the best balance of usability and code quality. It allows direct interaction with the codebase, understands existing files, and responds well to detailed prompts. When constraints are clearly mentioned, Cursor AI consistently generated correct, optimized, and readable code, making it ideal for real development and debugging tasks.

Conclusion:

For learning → Gemini

For quick coding assistance → Copilot

For serious development and prompt-based experimentation → Cursor AI