

Lab assignment- 2.5

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

Prompt : Write a Python program to calculate the sum of odd and even numbers in a list

Code and output :

```
File Edit Selection View Go Run Terminal Help < > AI

EXPLORER ... 1.5 Assignment.py U 2.5 Assignment.py U X
AI 2.5 Assignment.py > ...
1 #original code
2 numbers = [1, 2, 3, 4, 5, 6]
3 even_sum = 0
4 odd_sum = 0
5
6 for i in range(len(numbers)):
7     if numbers[i] % 2 == 0:
8         even_sum += numbers[i]
9     else:
10        odd_sum += numbers[i]
11
12 print("Even sum:", even_sum)
13 print("Odd sum:", odd_sum)
14
15 # Refactored Code (AI-Improved)
16
17 numbers = [1, 2, 3, 4, 5, 6]
18
19 even_sum = sum(n for n in numbers if n % 2 == 0)
20 odd_sum = sum(n for n in numbers if n % 2 != 0)
21
22 print("Even sum:", even_sum)
23 print("Odd sum:", odd_sum)
24

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL 1 PORTS

> > TERMINAL
== Test Case 2: Optimized Approach (Slicing) ==
Enter a string: manu
Reversed string: unam

C:\Users\gunda\OneDrive\Documents\Desktop\AT>C:/Users/gunda/appData/local/Python/pythoncore-3.14-64/python.exe "c:/users/gunda/OneDrive/Documents/Desktop/AT>2.5 Assignment.py"
Even Sum: 12
Odd Sum: 9
Even Sum: 12
Odd Sum: 9

C:\Users\gunda\OneDrive\Documents\Desktop\AT>

JavaSE-17 LTS
Python
```

Explanation

The refactored code is shorter, more readable, and efficient.

It removes manual loops and uses Python's built-in `sum()` with conditions, making the code easier to maintain.

Task 2: Area Calculation Explanation

Prompt : Explain a Python function that calculates the area of different shapes

Code and output :

The screenshot shows a Visual Studio Code (VS Code) interface. The top navigation bar includes File, Edit, Selection, View, Go, Run, Terminal, Help, and a search bar. On the left, there's an Explorer sidebar with icons for AI, Files, and a search bar. Below the sidebar, a tree view shows two files: '1.5 Assignment.py' and '2.5 Assignment.py'. The main editor area displays the content of '2.5 Assignment.py'. The code uses list comprehensions to calculate the sum of even and odd numbers from a list. It then prints the results. A function named 'calculate_area' is defined to calculate areas for circle, rectangle, and triangle based on input parameters. The bottom of the screen features a terminal window showing the execution of the script and its output.

```
File Edit Selection View Go Run Terminal Help < > 🔍 AI

EXPLORER ... 1.5 Assignment.py U 2.5 Assignment.py X
AI 2.5 Assignment.py > ...
17     numbers = [1, 2, 3, 4, 5, 6]
18
19     even_sum = sum(n for n in numbers if n % 2 == 0)
20     odd_sum = sum(n for n in numbers if n % 2 != 0)
21
22     print("Even Sum:", even_sum)
23     print("Odd Sum:", odd_sum)
24
25 #using functions
26
27 def calculate_area(shape, value1, value2=0):
28     if shape == "circle":
29         return 3.14 * value1 * value1
30     elif shape == "rectangle":
31         return value1 * value2
32     elif shape == "triangle":
33         return 0.5 * value1 * value2
34 a=calculate_area("circle",2,2)
35 print(a)
36

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL ⚡ PORTS
> > > TERMINAL
Odd Sum: 9
Even Sum: 12
Odd Sum: 9
C:\Users\gunda\OneDrive\Documents\Desktop\AI>c:/Users/gunda/AppData/Local/Python/pythoncore-3.14-64/python.exe "c:/Users/gunda/OneDrive/Documents/Desktop/AI/2.5 Assignment.py"
Odd Sum: 9
Even Sum: 12
Odd Sum: 9
Even Sum: 12
Odd Sum: 9
12.56
C:\Users\gunda\OneDrive\Documents\Desktop\AI>

In 35, Col 9, Spaces: 4, LITE-B, LF, C1 Python, PA, 3142, 68 Go Live
```

Explanation

Gemini clearly explains how the function works for different shapes.

It describes the parameters, logic flow, and formulas used, which helps beginners understand the code easily.

Task 3: Prompt Sensitivity Experiment

Prompt 1: Write a Python program to calculate the sum of even and odd numbers in a list

The screenshot shows the Visual Studio Code interface with the code editor open. The file 2.5 Assignment.py contains the following Python code:

```
File Edit Selection View Go Run Terminal Help <- > C:\Users\gunda\OneDrive\Documents\Desktop\AI> 1.5 Assignment.py U 2.5 Assignment.py U ... 2.5 Assignment.py > sum_even_odd 2.5 Assignment.py > sum_even_odd # Program to calculate the sum of even and odd numbers in a list 1 2 3 def sum_even_odd(numbers): 4     """Calculate the sum of even and odd numbers in a list""" 5     sum_even = 0 6     sum_odd = 0 7 8     for num in numbers: 9         if num % 2 == 0: 10             sum_even += num 11         else: 12             sum_odd += num 13 14     return sum_even, sum_odd 15 16 # Main program 17 if __name__ == "__main__": 18     # Get list of numbers from user 19     user_input = input("Enter numbers separated by spaces: ") 20     numbers = list(map(int, user_input.split())) 21 22     # calculate sums 23     even_sum, odd_sum = sum_even_odd(numbers) 24 25     # Display results 26     print(f"\nSum of even numbers: {even_sum}") 27     print(f"Sum of odd numbers: {odd_sum}")
```

The terminal below shows the output of running the program with the input "1 2 3 4 5 6 7".

```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS > > > TERMINAL Enter numbers separated by spaces: 1 2 3 4 5 6 7 Sum of even numbers: 12 Sum of odd numbers: 16 C:\Users\gunda\OneDrive\Documents\Desktop\AI>
```

Explanation:

For **Prompt 1 (Basic Prompt)**, Cursor AI generated a simple loop-based program using conditional statements. This version is easy to understand and suitable for beginners, but it uses more lines of code and manual variable updates.

Prompt 2: Write a clean and readable Python program to find the sum of even and odd numbers in a list suitable for beginners

Code and output:

The screenshot shows the Visual Studio Code interface with the code editor open. The file 2.5 Assignment.py contains the following Python code:

```
File Edit Selection View Go Run Terminal Help <- > C:\Users\gunda\OneDrive\Documents\Desktop\AI> 1.5 Assignment.py U 2.5 Assignment.py U ... 2.5 Assignment.py > ... 2.5 Assignment.py > numbers = [1, 2, 3, 4, 5, 6] 1 2 3 even_sum = 0 odd_sum = 0 4 5 for number in numbers: 6     if number % 2 == 0: 7         even_sum += number 8     else: 9         odd_sum += number 10 11 12 print("Sum of Even Numbers:", even_sum) 13 print("Sum of Odd Numbers:", odd_sum)
```

The terminal below shows the output of running the program with the input "1, 2, 3, 4, 5, 6".

```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS > > > TERMINAL Enter a number: clear Please enter a valid number. Enter a number: Traceback (most recent call last): File "C:\Users\gunda\OneDrive\Documents\Desktop\AI\2.5 Assignment.py", line 8, in <module> user_input = input("Enter a number: ") KeyboardInterrupt ^C C:\Users\gunda\OneDrive\Documents\Desktop\AI>clear 'clear' is not recognized as an internal or external command, operable program or batch file. C:\Users\gunda\OneDrive\Documents\Desktop\AI>
```

Explanation : For **Prompt 2 (Readability-Focused Prompt)**, the AI produced code with clearer variable names and better formatting. Although the logic is similar to the basic version, readability and clarity were improved, making the code easier to review and maintain.

Prompt 3: Write an optimized Python program to calculate the sum of even and odd numbers in a list using built-in functions

Code and output:

The screenshot shows the Visual Studio Code interface. In the Explorer sidebar, there are two files: '1.5 Assignment.py' and '2.5 Assignment.py'. The '2.5 Assignment.py' file is open in the editor, containing the following Python code:

```
numbers = [1, 2, 3, 4, 5, 6]
even_sum = sum(n for n in numbers if n % 2 == 0)
odd_sum = sum(n for n in numbers if n % 2 != 0)
print("Even Sum:", even_sum)
print("Odd Sum:", odd_sum)
```

In the Terminal tab, the output of running the script is shown:

```
KeyboardInterrupt
^C
C:\Users\gunda\OneDrive\Documents\Desktop\AI>clear
'clear' is not recognized as an internal or external command,
operable program or batch file.

C:\Users\gunda\OneDrive\Documents\Desktop\AI>C:/Users/gunda/AppData/Local/Python/pythoncore-3.14-64/python.exe "c:/Users/gunda/OneDrive/Documents/Desktop/AI/2.5 Assignment.py"
Sum of Even Numbers: 12
Sum of Odd Numbers: 9

C:\Users\gunda\OneDrive\Documents\Desktop\AI>C:/Users/gunda/AppData/Local/Python/pythoncore-3.14-64/python.exe "c:/Users/gunda/OneDrive/Documents/Desktop/AI/2.5 Assignment.py"
Even Sum: 12
Odd Sum: 9

C:\Users\gunda\OneDrive\Documents\Desktop\AI>
```

Explanation: For **Prompt 3 (Optimized Prompt)**, Cursor AI generated a more efficient solution using Python's built-in sum() function along with conditions. This version reduced the number of lines and improved code efficiency while maintaining correctness.

Prompt 4 : Write a Python program to calculate the sum of even and odd numbers in a list using functions

Code and output :

The screenshot shows the Visual Studio Code interface. In the Explorer sidebar, there are two files: '1.5 Assignment.py' and '2.5 Assignment.py'. The '2.5 Assignment.py' file is open in the editor, containing the following Python code:

```
def calculate_even_odd_sum(numbers):
    even_sum = sum(n for n in numbers if n % 2 == 0)
    odd_sum = sum(n for n in numbers if n % 2 != 0)
    return even_sum, odd_sum

nums = [1, 2, 3, 4, 5, 6]
even, odd = calculate_even_odd_sum(nums)
print("Even Sum:", even)
print("Odd Sum:", odd)
```

In the Terminal tab, the output of running the script is shown:

```
C:\Users\gunda\OneDrive\Documents\Desktop\AI>C:/Users/gunda/AppData/Local/Python/pythoncore-3.14-64/python.exe "c:/Users/gunda/OneDrive/Documents/Desktop/AI/2.5 Assignment.py"
Sum of Even Numbers: 12
Sum of Odd Numbers: 9

C:\Users\gunda\OneDrive\Documents\Desktop\AI>C:/Users/gunda/AppData/Local/Python/pythoncore-3.14-64/python.exe "c:/Users/gunda/OneDrive/Documents/Desktop/AI/2.5 Assignment.py"
Even Sum: 12
Odd Sum: 9

C:\Users\gunda\OneDrive\Documents\Desktop\AI>
```

Explanantion:

For **Prompt 4 (Function-Based Prompt)**, the AI created a modular solution using a user-defined function. This approach improves reusability, debugging ease, and maintainability, making it suitable for larger applications.

Task 4: Tool Comparison Reflection

Reflection

Based on the experiments performed in this lab, Google Gemini, GitHub Copilot, and Cursor AI each have different strengths.

Google Gemini is very useful for understanding code, as it provides clear explanations and works well in Google Colab, especially for beginners.

GitHub Copilot offers real-time code suggestions inside VS Code and is best suited for daily development and writing production-ready code.

Cursor AI is effective for experimenting with different prompts, refactoring code, and analyzing multiple coding approaches.