

# AI ASSISTED CODING

SCHOOL OF COMPUTER SCIENCE AND ARTIFICIAL INTELLIGENCE

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BATCH – 03

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## ASSIGNMENT – 2.5

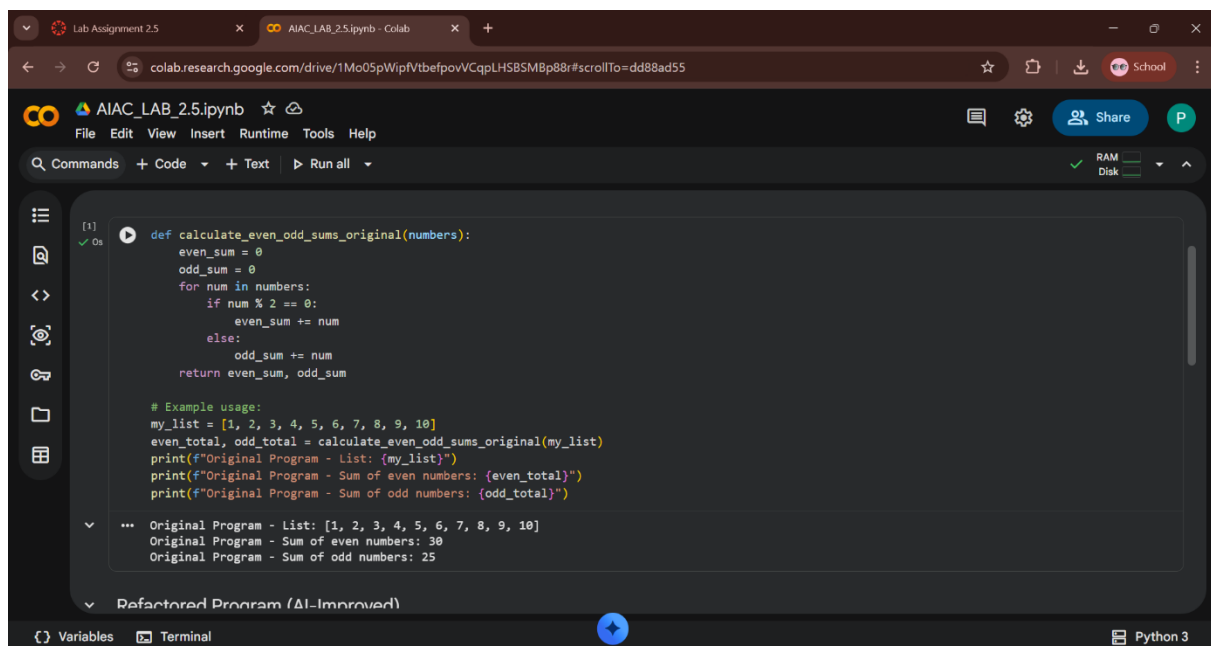
**Lab 2:** Exploring Additional AI Coding Tools beyond Copilot – Gemini (Colab) and Cursor AI.

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

**Prompt:** Write a Python program that takes a list of integers and calculates the sum of even numbers and the sum of odd numbers separately. After generating the working program, refactor (improve) the code using AI to make it cleaner, more readable, and efficient. Provide both the original code and the refactored version.

**Code:**

**Original Code:**



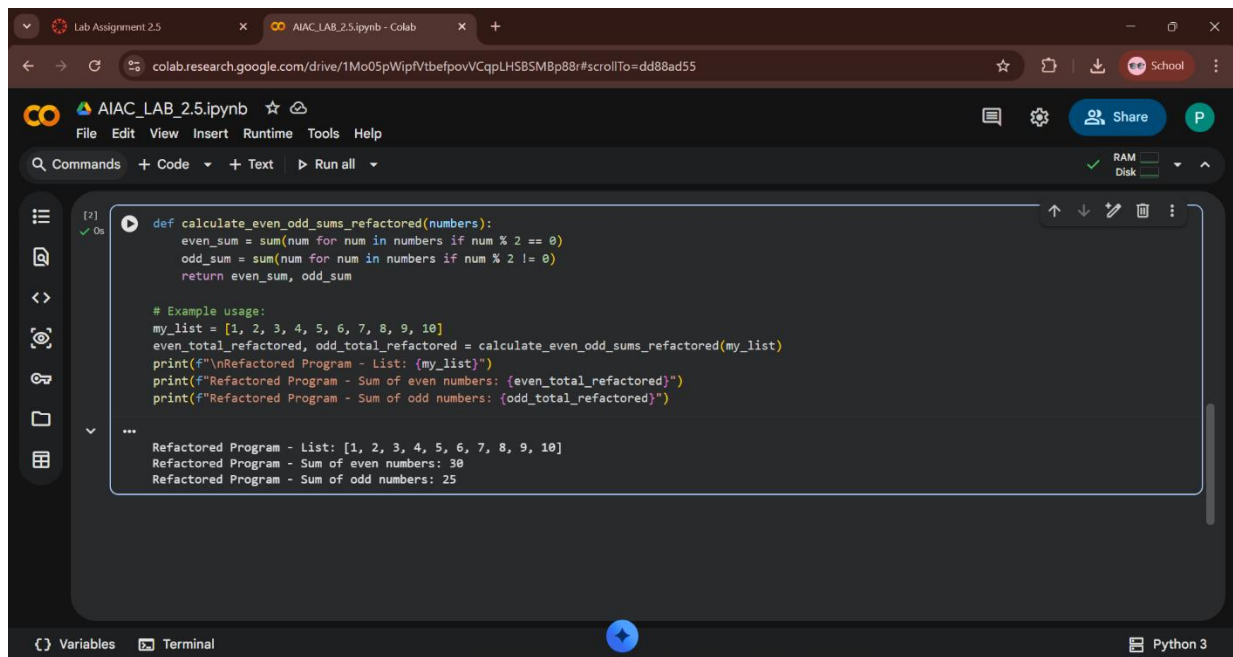
```
[1] def calculate_even_odd_sums_original(numbers):
    even_sum = 0
    odd_sum = 0
    for num in numbers:
        if num % 2 == 0:
            even_sum += num
        else:
            odd_sum += num
    return even_sum, odd_sum

# Example usage:
my_list = [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
even_total, odd_total = calculate_even_odd_sums_original(my_list)
print(f"Original Program - List: {my_list}")
print(f"Original Program - Sum of even numbers: {even_total}")
print(f"Original Program - Sum of odd numbers: {odd_total}")

... Original Program - List: [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
Original Program - Sum of even numbers: 30
Original Program - Sum of odd numbers: 25

Refactored Program (AI-Improved)
```

## AI Improved Code:



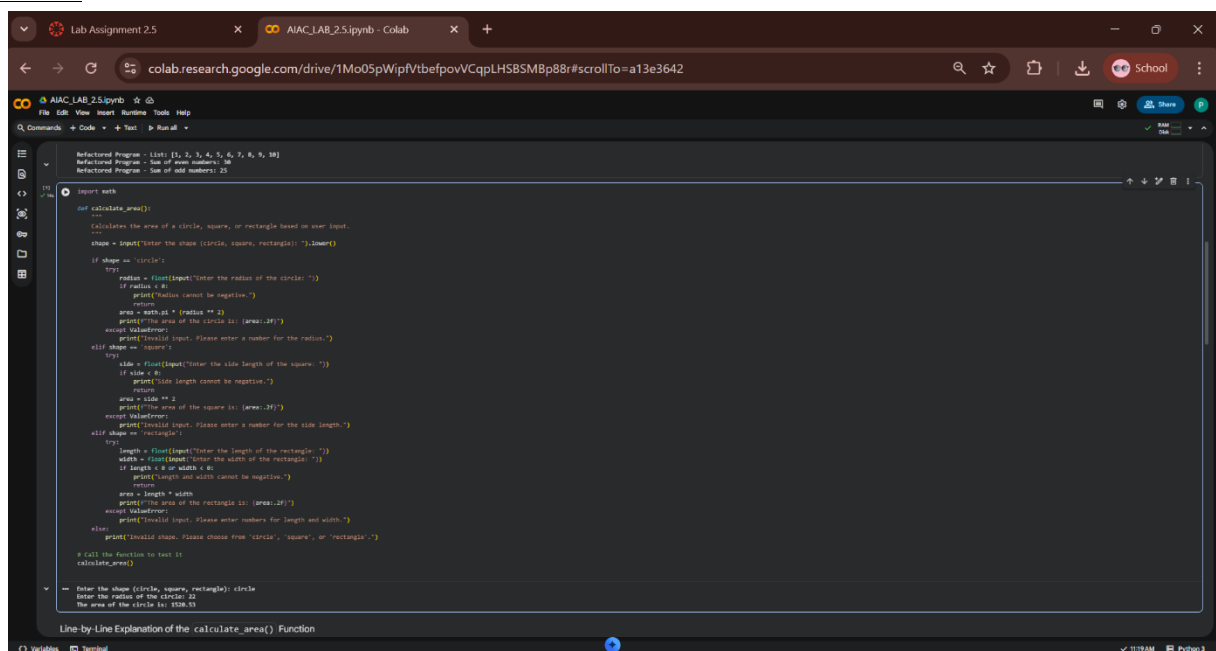
The screenshot shows a Google Colab notebook titled "AIAC\_LAB\_2.5.ipynb". The code defines a function `calculate_even_odd_sums_refactored` that takes a list of numbers and returns the sum of even and odd numbers. The function is tested with a list `[1, 2, 3, 4, 5, 6, 7, 8, 9, 10]`, resulting in even sum 30 and odd sum 25.

```
[2] def calculate_even_odd_sums_refactored(numbers):  
    even_sum = sum(num for num in numbers if num % 2 == 0)  
    odd_sum = sum(num for num in numbers if num % 2 != 0)  
    return even_sum, odd_sum  
  
# Example usage:  
my_list = [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]  
even_total_refactored, odd_total_refactored = calculate_even_odd_sums_refactored(my_list)  
print(f"Refactored Program - List: {my_list}")  
print(f"Refactored Program - Sum of even numbers: {even_total_refactored}")  
print(f"Refactored Program - Sum of odd numbers: {odd_total_refactored}")  
...  
Refactored Program - List: [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]  
Refactored Program - Sum of even numbers: 30  
Refactored Program - Sum of odd numbers: 25
```

## Task 2: Area Calculation Explanation.

**Prompt:** Write a Python function that calculates the area of different shapes (circle, square, and rectangle) based on user input. Then explain the function line by line in simple language so that a junior developer can easily understand it.

### Code:



The screenshot shows a Google Colab notebook titled "AIAC\_LAB\_2.5.ipynb". The code defines a function `calculate_area` that calculates the area of a circle, square, or rectangle based on user input. The function is tested with a circle of radius 22, resulting in an area of 1520.53.

```
def calculate_area():  
    """  
    calculates the area of a circle, square, or rectangle based on user input.  
    """  
    shape = input("Enter the shape (circle, square, rectangle): ").lower()  
    if shape == 'circle':  
        try:  
            radius = float(input("Enter the radius of the circle: "))  
            if radius < 0:  
                print("Radius cannot be negative.")  
                return  
            area = math.pi * (radius ** 2)  
            print(f"The area of the circle is: {area:.2f}")  
        except ValueError:  
            print("Invalid input. Please enter a number for the radius.")  
    elif shape == 'square':  
        try:  
            side = float(input("Enter the side length of the square: "))  
            if side < 0:  
                print("Side length cannot be negative.")  
                return  
            area = side ** 2  
            print(f"The area of the square is: {area:.2f}")  
        except ValueError:  
            print("Invalid input. Please enter a number for the side length.")  
    elif shape == 'rectangle':  
        try:  
            length = float(input("Enter the length of the rectangle: "))  
            width = float(input("Enter the width of the rectangle: "))  
            if length < 0 or width < 0:  
                print("Length and width cannot be negative.")  
                return  
            area = length * width  
            print(f"The area of the rectangle is: {area:.2f}")  
        except ValueError:  
            print("Invalid input. Please enter numbers for length and width.")  
    else:  
        print("Invalid shape. Please choose from 'circle', 'square', or 'rectangle'.")  
  
    # Call the function to test it  
    calculate_area()  
  
# Enter the shape (circle, square, rectangle): circle  
# Enter the radius of the circle: 22  
# The area of the circle is: 1520.53
```

Line-by-Line Explanation of the `calculate_area()` Function

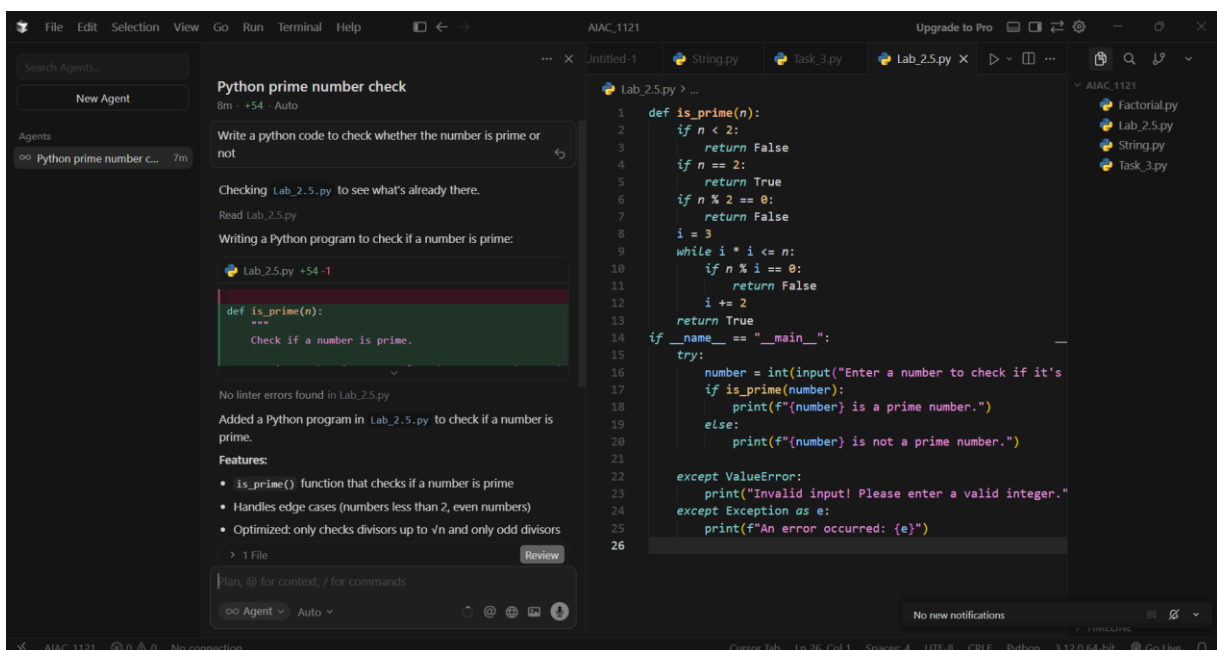
### **Explanation:**

The `calculate_area()` function helps users find the area of circles, squares, or rectangles. It asks for the shape and necessary dimensions, like radius or side length, then calculates and prints the result. The function includes error handling to manage invalid inputs and ensures dimensions are non-negative, using Python's `math` module for calculations.

### **Task 3:** Prompt Sensitivity Experiment.

**Prompt 1(Simple):** Write a Python Code to check whether the given Number is Prime or Not

### **Code:**



```
1 def is_prime(n):
2     if n < 2:
3         return False
4     if n == 2:
5         return True
6     if n % 2 == 0:
7         return False
8     i = 3
9     while i * i <= n:
10        if n % i == 0:
11            return False
12        i += 2
13    return True
14 if __name__ == "__main__":
15     try:
16         number = int(input("Enter a number to check if it's
17         if is_prime(number):
18             print(f"{number} is a prime number.")
19         else:
20             print(f"{number} is not a prime number.")
21     except ValueError:
22         print("Invalid input! Please enter a valid integer.")
23     except Exception as e:
24         print(f"An error occurred: {e}")
25
```

**Prompt 2(Medium & Detailed):** Write an efficient Python function that checks whether a number is prime. Use proper variable names and handle edge cases.

## Code:

```
1 def is_prime(number):
2     if number < 2:
3         return False
4     if number == 2:
5         return True
6     if number % 2 == 0:
7         return False
8     divisor = 3
9     while divisor * divisor <= number:
10         if number % divisor == 0:
11             return False
12         divisor += 2
13
14     return True
15
16
17 if __name__ == "__main__":
18     try:
19         number = int(input("Enter a number to check if it's
20         if is_prime(number):
21             print(f"{number} is a prime number.")
22         else:
23             print(f"{number} is not a prime number.")
24
25     except ValueError:
26         print("Invalid input! Please enter a valid integer.")
27     except Exception as e:
28         print(f"An error occurred: {e}")
29
```

**Prompt 3(Hard & More Detailed):** Write a Python function to check prime numbers using a loop. Avoid built-in functions, add proper comments, and follow clean coding practices.

## Code:

```
1 def is_prime(number):
2     """
3     Check if a number is prime using a loop-based approach.
4
5     A prime number is a natural number greater than 1 that has
6     no positive divisors other than 1 and itself.
7
8     Args:
9         number (int): The number to check for primality
10
11     Returns:
12         bool: True if number is prime, False otherwise
13     """
14     # Edge case: numbers less than 2 cannot be prime
15     # (including negative numbers, zero, and one)
16     if number < 2:
17         return False
18
19     # Edge case: 2 is the smallest and only even prime number
20     if number == 2:
21         return True
22
23     # Edge case: all even numbers greater than 2 are composite
24     # (divisible by 2, so not prime)
25     if number % 2 == 0:
26         return False
27
28     # Check for divisors using a loop
29     # Start from 3 and check only odd numbers (even numbers
30     # We only need to check up to the square root of the number
31     # because if number has a factor greater than sqrt(number),

```

#### **Task 4:** Tool Comparison Reflection.

**Prompt:** Based on my experiments with Gemini, GitHub Copilot, and Cursor AI, compare these three tools in terms of:

- Ease of use
  - Code quality
  - Clarity of explanation
  - Overall usefulness for students and developers
- Write a short reflection (8–10 lines).

#### **Short Reflection:**

Based on my experience, all three AI tools—Gemini, GitHub Copilot, and Cursor AI—are useful for AI-assisted coding, but in different ways. Gemini was very helpful for understanding concepts because it provided clear explanations along with code. GitHub Copilot generated concise and professional-level code, making it suitable for real-world development. However, Copilot gave limited explanations compared to Gemini. Cursor AI was useful for experimenting with different prompts and observing how code changes based on instructions. It also helped in refactoring and improving existing code effectively. In terms of usability, Gemini was the most beginner-friendly, while Copilot and Cursor were better suited for experienced programmers. Overall, Gemini is best for learning, Copilot for coding speed, and Cursor AI for refinement and experimentation.

**THANK YOU !!**