

AI ASSISTED CODING

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BATCH – 03

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ASSIGNMENT – 2.5

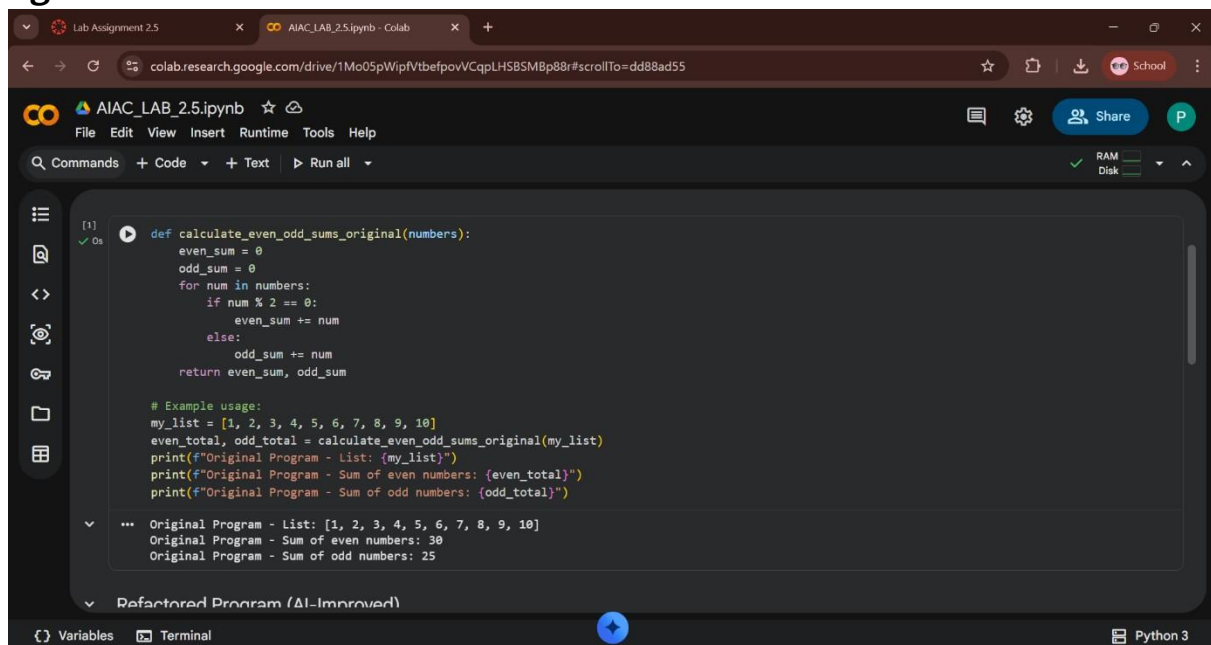
Lab 2: Exploring Additional AI Coding Tools beyond Copilot – Gemini (Colab) and Cursor AI.

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(numbers)` that calculates the sum of even and odd numbers in a list. It includes an example usage with a list `[1, 2, 3, 4, 5, 6, 7, 8, 9, 10]` and prints the results.

```
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. It includes comments explaining each step of the function.

```
def calculate_area():
    """
    calculate the area of a circle, square, or rectangle based on user input.
    """
    shape = input("Enter the shape (circle, square, rectangle): ").lower()
    if shape == "circle":
        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":
        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":
        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()
```

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

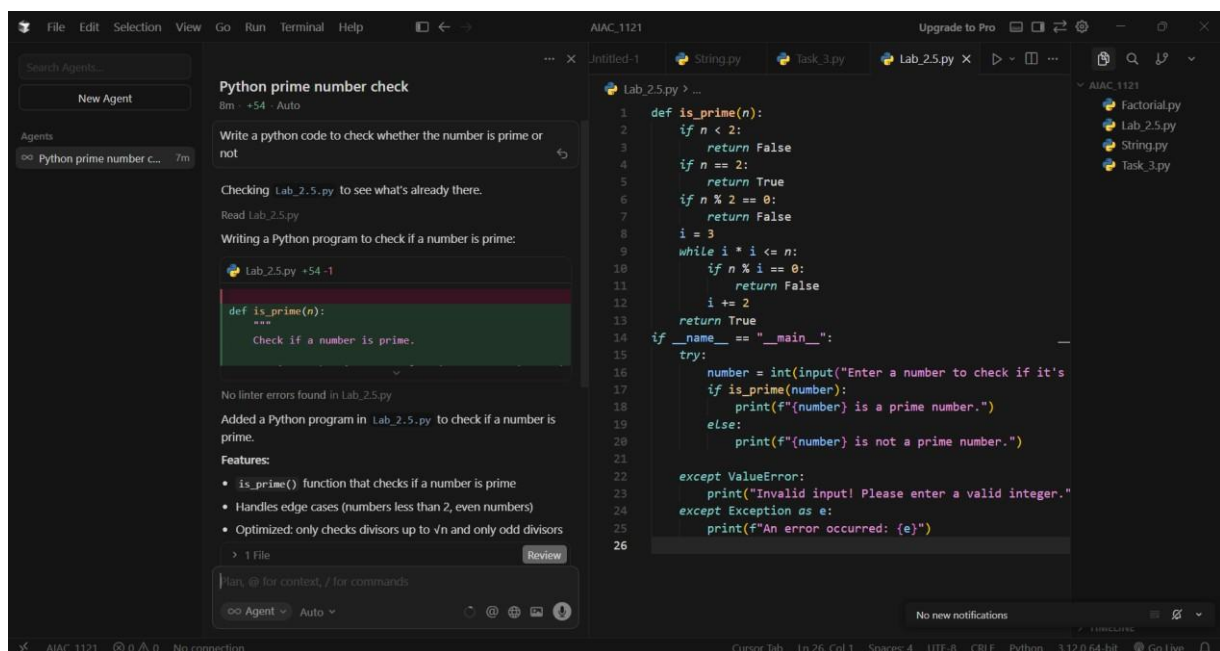
Explanation:

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:**

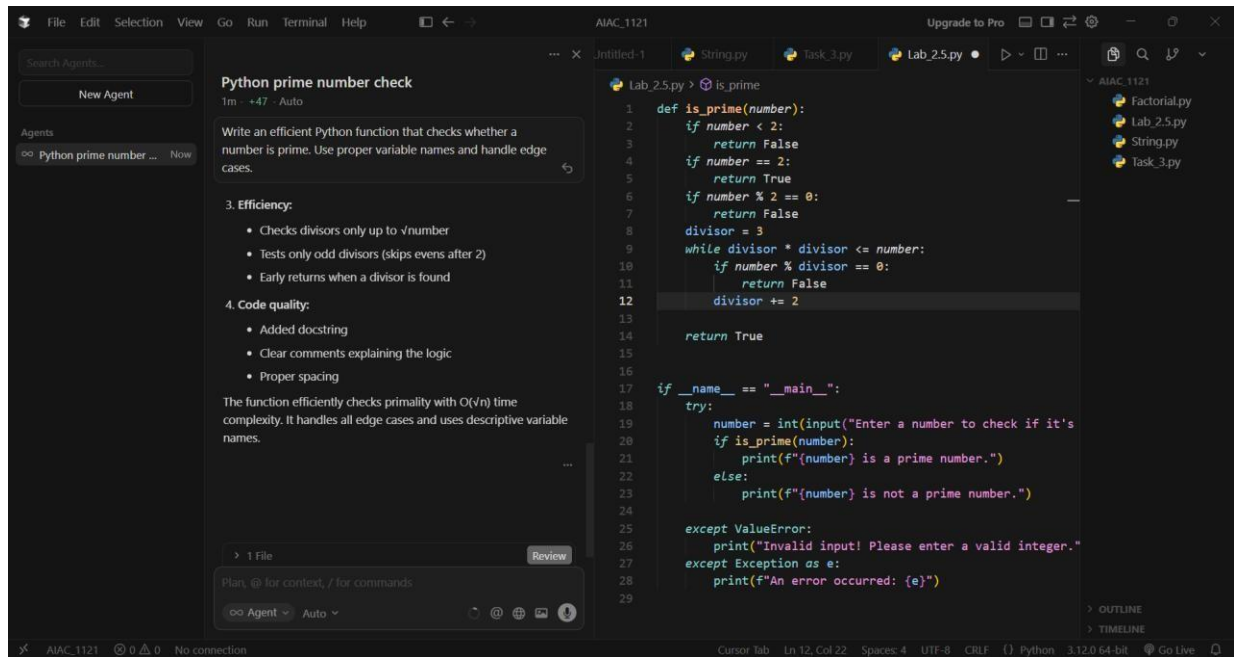


The screenshot shows a code editor with a dark theme. On the left, there's a sidebar with a search bar and a list of agents. The main editor area displays a Python file named 'Lab_2.5.py'. The code defines a function 'is_prime(n)' that checks if a number is prime. It handles edge cases for numbers less than 2 and uses a while loop to check for divisors up to the square root of n. The function is then used in a main block to prompt the user for a number and print the result. The code is as follows:

```
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
```

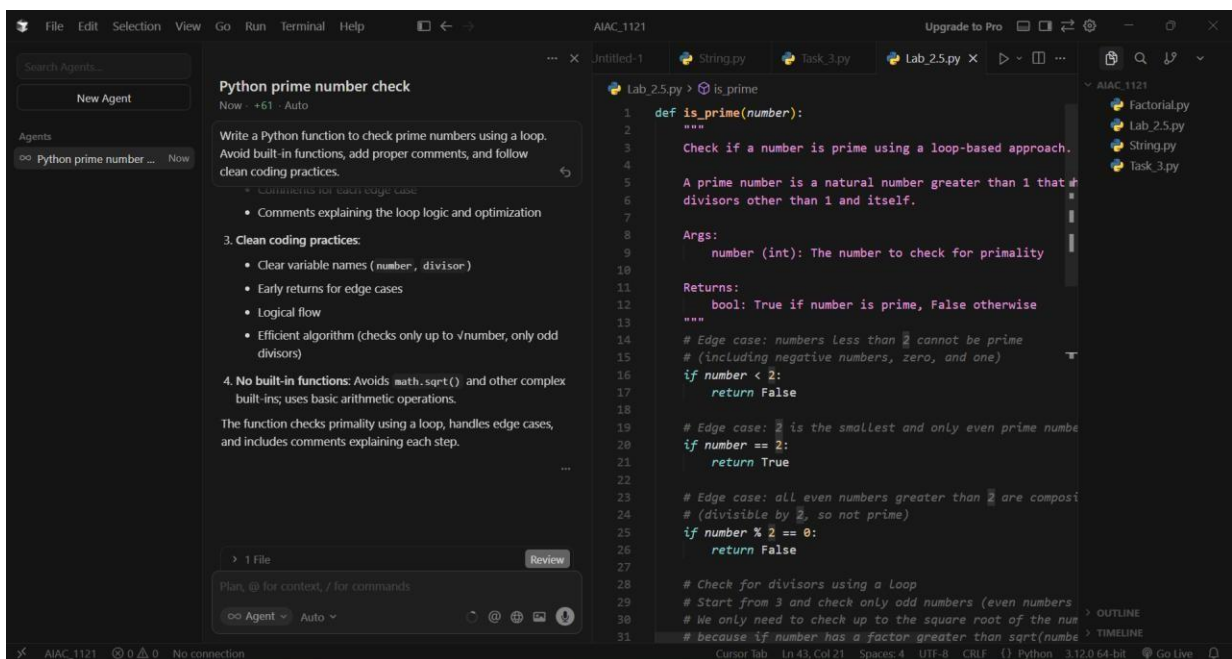
Prompt 2(Medium & Detailed): Write an efficient Python function that checks whether a number is prime. Use proper variable names and handle edge cases.

Code:



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:



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 beginnerfriendly, 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 !!