ASSIGNMENT 9.3

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BATCH: 05

TASK 1:

Basic Docstring Generation

Scenario

You are developing a utility function that processes numerical lists and must be properly documented for future maintenance.

Requirements

• Write a Python function to return the sum of even numbers and sum of odd numbers in a given list

• Manually add a Google Style docstring to the function

• Use an AI-assisted tool (Copilot / Cursor AI) to generate a function-level docstring

• Compare the AI-generated docstring with the manually written docstring

• Analyze clarity, correctness, and completeness

INPUT and OUTPUT

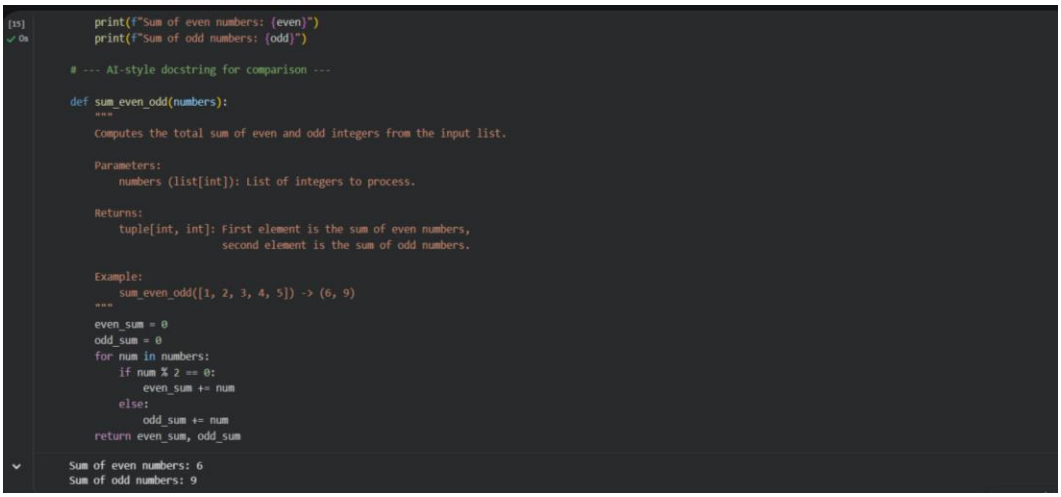
```
[15]
✓ 0s
def sum_even_odd(numbers):
    """Calculates the sum of even and odd numbers in a list.

    Args:
        numbers (list of int): A list containing integer values.

    Returns:
        tuple: A tuple containing two integers:
            - The sum of even numbers.
            - The sum of odd numbers.

    Example:
        >>> sum_even_odd([1, 2, 3, 4, 5])
        (6, 9)
    """
    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
if __name__ == "__main__":
    nums = [1, 2, 3, 4, 5]
    even, odd = sum_even_odd(nums)
```



```
[15]        print(f"Sum of even numbers: {even}")
✓ 0s        print(f"Sum of odd numbers: {odd}")

    # --- AI-style docstring for comparison ---

    def sum_even_odd(numbers):
        """
        Computes the total sum of even and odd integers from the input list.

        Parameters:
            numbers (list[int]): List of integers to process.

        Returns:
            tuple[int, int]: First element is the sum of even numbers,
                             second element is the sum of odd numbers.

        Example:
            sum_even_odd([1, 2, 3, 4, 5]) -> (6, 9)
        """
        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

    Sum of even numbers: 6
    Sum of odd numbers: 9
```

TASK 2:

You are developing a student management module that must be easy to understand for new developers.

Requirements

• Write a Python program for an sru_student class with the following:

– Attributes: name, roll_no, hostel_status

– Methods: fee_update() and display_details()

• Manually write inline comments for each line or logical block

• Use an AI-assisted tool to automatically add inline comments

• Compare manual comments with AI-generated comments

• Identify missing, redundant, or incorrect AI comments

Prompt:

Create a Python class sru_student with manual and AI-generated inline comments and include a comparison for lab submission

INPUT and OUTPUT

```python
class sru_student:
    # Constructor method for the sru_student class
    def __init__(self, name, roll_no, hostel_status):
        # Assign the provided name to the instance's name attribute
        self.name = name
        # Assign the provided roll_no to the instance's roll_no attribute
        self.roll_no = roll_no
        # Assign the provided hostel_status to the instance's hostel_status attribute
        self.hostel_status = hostel_status

    # Method to update the student's hostel status
    def fee_update(self, new_hostel_status):
        # Update the hostel_status attribute with the new value
        self.hostel_status = new_hostel_status
        # Print a confirmation message indicating the update
        print(f"Hostel status for {self.name} (Roll No: {self.roll_no}) updated to: {self.hostel_status}")

    # Method to display the student's details
    def display_details(self):
        # Print a header for student details
        print(f"\nStudent Details:")
        # Print the student's name
        print(f"Name: {self.name}")
        # Print the student's roll number
        print(f"Roll No: {self.roll_no}")
        # Print the student's hostel status
        print(f"Hostel Status: {self.hostel_status}")

# Create an instance of the sru_student class
student1 = sru_student("Chaitanya", "2303A51292", "In-Hostel")

# Display initial details of the student
student1.display_details()

# Update the hostel status of the student
student1.fee_update("Day Scholar")

# Display details after the hostel status update
student1.display_details()
```

```
Student Details:
Name: Chaitanya
Roll No: 2303A51292
Hostel Status: In-Hostel
Hostel status for Chaitanya (Roll No: 2303A51292) updated to: Day Scholar

Student Details:
Name: Chaitanya
Roll No: 2303A51292
Hostel Status: Day Scholar
```

TASK 3:

You are building a small calculator module that will be shared across multiple projects and requires structured documentation.

Requirements

• Write a Python script containing 3–4 functions (e.g., add, subtract, multiply, divide)

• Manually write NumPy Style docstrings for each function

• Use AI assistance to generate:

– A module-level docstring

– Individual function-level docstrings

• Compare AI-generated docstrings with manually written ones

• Evaluate documentation structure, accuracy, and readability

Prompt:

Generate a Python calculator program with NumPy-style docstrings,

AI-generated docstrings, and a comparison for lab submission

```
"""
calculator.py

A simple calculator module that provides basic arithmetic operations.
This module can be reused in different projects.
"""

def add(a, b):
    """
    Add two numbers.

    Parameters
    ----------
    a : int or float
        First number
    b : int or float
        Second number

    Returns
    -------
    float
        Sum of a and b
    """
    return a + b


def subtract(a, b):
    """
    Subtract two numbers.
```

```
    Parameters
    ----------
    a : int or float
        First number
    b : int or float
        Second number

    Returns
    -------
    float
        Difference of a and b
    """
    return a - b


def multiply(a, b):
    """
    Multiply two numbers.

    Parameters
    ----------
    a : int or float
        First number
    b : int or float
        Second number

    Returns
    -------
    float
        Product of a and b
```

```
    return a * b


def divide(a, b):
    """
    Divide two numbers.

    Parameters
    ----------
    a : int or float
        Dividend
    b : int or float
        Divisor

    Returns
    -------
    float
        Division result

    Raises
    ------
    ValueError
        If divisor is zero
    """
    if b == 0:
        raise ValueError("Cannot divide by zero")
    return a / b
# Testing the functions
print("Add:", add(10, 5))
```

```
        Division result

    Raises
    ------
    ValueError
        If divisor is zero
    """
    if b == 0:
        raise ValueError("Cannot divide by zero")
    return a / b
# Testing the functions
print("Add:", add(10, 5))
print("Subtract:", subtract(10, 5))
print("Multiply:", multiply(10, 5))
print("Divide:", divide(10, 5))


Add: 15
Subtract: 5
Multiply: 50
Divide: 2.0
```