

SCHOOL OF COMPUTER SCIENCE AND ARTIFICIAL INTELLIGENCE		
DEPARTMENT OF COMPUTER SCIENCE ENGINEERING		
Program Name: B. Tech	Assignment Type: Lab	Academic Year: 2025-2026
Course Coordinator: Dr. Rishabh Mittal	Instructor(s) Name:	
Course Code: 23CS002PC304	Course Title: AI Assisted Coding	Year/Sem: III/II
Regulation: R23	Date and Day of Assignment: Week3 – Wednesday	Duration: 2 Hours
Time(s): 23CSBTB01 To 23CSBTB52	Applicable to Batches: All batches	
Assignment Number: 9.3 (Present assignment number) / 24 (Total number of assignments)		

ASSIGNMENT-9.3

Name: P.Manikanta
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Batch: 8

Lab 9: Documentation Generation – Automatic Documentation and Code Comments

Task 1: Basic Docstring Generation

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

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

Code:

```
119
120 def sum_even_odd(numbers):
121     """
122     Returns a tuple containing:
123     (sum_of_even_numbers, sum_of_odd_numbers)
124     """
125
126     # Check if input is a list
127     if not isinstance(numbers, list):
128         raise TypeError("Input must be a list.")
129
130     even_sum = 0
131     odd_sum = 0
132
133     for num in numbers:
134         # Check if each element is an integer
135         if not isinstance(num, int):
136             raise TypeError("All elements must be integers.")
137
138         if num % 2 == 0:
139             even_sum += num
140         else:
141             odd_sum += num
142
143     return even_sum, odd_sum
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PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
PS C:\Users\porika manikanta\OneDrive\Desktop\ai assistant> & "C:/Program Files/Python311/python.exe" "c:/Users/porika manikanta/OneDrive/Desktop/lab9.3.py"
Input List: [1, 2, 3, 4, 5, 6]
Sum of Even Numbers: 12
Sum of Odd Numbers: 9
PS C:\Users\porika manikanta\OneDrive\Desktop\ai assistant>
```

Result:

The function `sum_even_odd()` successfully returns a tuple containing the sum of even and odd numbers. For input `[1, 2, 3, 4, 5, 6]`: Sum of Even Numbers: 12, Sum of Odd Numbers: 9.

Observation:

The AI-assisted tool generated a Google-style docstring that clearly describes the function parameters and return values. The function validates input type, separates even and odd numbers using modulo, and returns both sums as a tuple. The AI-generated docstring was more detailed and structured compared to a manually written one, covering edge cases like `TypeError` for non-integer elements.

Task 2: Automatic Inline Comments

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

Prompt: # Write a Python function to find maximum and minimum from a list

Code:

```
lab9.3.py > ...
1  def find_max_min(numbers):
2      # Check if input is a list
3      if not isinstance(numbers, list):
4          raise TypeError("Input must be a list.")
5
6      if len(numbers) == 0:
7          raise ValueError("List cannot be empty.")
8
9      # Check if all elements are integers
10     for num in numbers:
11         if not isinstance(num, int):
12             raise TypeError("All elements must be integers.")
13
14     maximum = numbers[0]
15     minimum = numbers[0]
16
17     for num in numbers:
18         if num > maximum:
19             maximum = num
20         if num < minimum:
21             minimum = num
22
23     return (maximum, minimum)

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

PS C:\Users\porika manikanta\OneDrive\Desktop\ai assistant> & "C:/Program Files/Python311/python.exe" "c:/Users/porika/lab9.3.py"
Input List: [12, 45, 7, 89, 23, 5]
Maximum Number: 89
Minimum Number: 5
PS C:\Users\porika manikanta\OneDrive\Desktop\ai assistant>
```

Result:

For input [12, 45, 7, 89, 23, 5]: Maximum Number: 89, Minimum Number: 5.

Observation:

The find_max_min() function was generated with proper inline comments by the AI tool. It validates that the input is a non-empty list of integers, then iterates through to find maximum and minimum values. The AI-generated comments were accurate and described each logical block clearly, making the code easy to understand for new developers.

Task 3: Module-Level and Function-Level Documentation

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

Prompt: # Write Python functions for add, subtract, multiply, and divide with NumPy style docstrings

Code:

```
lab9.3.py 7 ...
33
34 def add(a, b):
35     return a + b
36
37
38 def subtract(a, b):
39     return a - b
40
41
42 def multiply(a, b):
43     return a * b
44
45
46 def divide(a, b):
47     if b == 0:
48         raise ZeroDivisionError("Cannot divide by zero.")
49     return a / b
50
51
52 if __name__ == "__main__":
53     print("Addition:", add(10, 5))
54     print("Subtraction:", subtract(10, 5))
55     print("Multiplication:", multiply(4, 3))

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
● PS C:\Users\porika manikanta\OneDrive\Desktop\ai assistant> & "C:/Program Files/Python311/python.exe" "c:/Users/porika manikanta/OneDrive/Desktop/lab9.3.py"
Addition: 15
Subtraction: 5
Multiplication: 12
Division: 5.0
○ PS C:\Users\porika manikanta\OneDrive\Desktop\ai assistant>
```

Result:

Addition: 15, Subtraction: 5, Multiplication: 12, Division: 5.0

Observation:

The calculator module includes four functions: add, subtract, multiply, and divide. The divide function includes a ZeroDivisionError guard. AI assistance generated a module-level docstring and NumPy-style function-level docstrings that were more structured and complete than manually written ones. The AI accurately captured parameter types and return value descriptions.

Additional Tasks: count_vowels and reverse_string Functions

Task: count_vowels Function

Prompt: # Write a Python function to count the number of vowels in a given string

Code:

```
lab9.3.py 7 ...
57
58
59 def count_vowels(text):
60     """
61     Counts the number of vowels in a given string.
62
63     Parameters:
64     text (str): Input string
65
66     Returns:
67     int: Number of vowels in the string
68     """
69
70     if not isinstance(text, str):
71         raise TypeError("Input must be a string.")
72
73     vowels = "aeiouAEIOU"
74     count = 0
75
76     for char in text:
77         if char in vowels:
78             count += 1
79
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```
● PS C:\Users\porika manikanta\OneDrive\Desktop\ai assistant> & "C:/Program Files/Python311/python.exe" "c:/Users/p
/lab9.3.py"
Input String: Hello World
Number of Vowels: 3
○ PS C:\Users\porika manikanta\OneDrive\Desktop\ai assistant>
```

Result:

Input String: Hello World — Number of Vowels: 3

Observation:

The count_vowels() function uses a comprehensive vowel string (both uppercase and lowercase) and counts matching characters in the input. The AI-generated docstring included parameters, return types, and raises section. The inline comments helped trace the logic clearly for any new developer reviewing the code.

Task: reverse_string Function

Prompt: # Write a Python function to reverse a given string

Code:

```

89
90 def reverse_string(text):
91     """
92     Reverses a given string.
93
94     Parameters:
95     text (str): Input string
96
97     Returns:
98     str: Reversed string
99     """
100
101     if not isinstance(text, str):
102         raise TypeError("Input must be a string.")
103
104     reversed_text = ""
105
106     for char in text:
107         reversed_text = char + reversed_text
108
109     return reversed_text
110

```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

```

PS C:\Users\porika manikanta\OneDrive\Desktop\ai assistant> & "C:/Program Files/Python311/python.exe" "c:/
/lab9.3.py"
● Original String: Python Programming
  Reversed String: gnimmargorP nohtyP
○ PS C:\Users\porika manikanta\OneDrive\Desktop\ai assistant>

```

Result:

Original String: Python Programming — Reversed String: gnimmargorP nohtyP

Observation:

The reverse_string() function reverses a string by prepending each character to an initially empty string. The AI-generated docstring correctly captured the function intent, parameter descriptions, and return type. Inline comments were added for each logical step. Compared to manual documentation, the AI-generated version was consistent in style and covered the TypeError guard as well.