

SCHOOL OF COMPUTER SCIENCE AND ARTIFICIAL INTELLIGENCE		DEPARTMENT OF COMPUTER SCIENCE ENGINEERING	
Program Name: B. Tech		Assignment Type: Lab	
<b>Course Coordinator Name</b>		Dr. Rishabh Mittal	
<b>CourseCode</b>	23CS002PC304	<b>Course Title</b>	AI Assisted Coding
<b>Year/Sem</b>	III/II	<b>Regulation</b>	R23
<b>HALLTICKET</b>	2303A54055	<b>ASS</b>	9.3
<b>Name</b>	V.SUSHMITHA	<b>Applicable to Batches</b>	47_B
<b>AssignmentNumber:</b> 9.3(Present assignment number)/24(Total number of assignments)			

<b>Q.No.</b>	<b>Question</b>	<i>Expected Time to complete</i>
	<p><b>Lab 9: Documentation Generation – Automatic Documentation and Code Comments</b></p> <p><b>Lab Objectives</b></p> <ul style="list-style-type: none"> <li>• To understand the importance of documentation and code comments in software development</li> <li>• To explore how AI-assisted coding tools generate documentation and inline comments</li> <li>• To practice generating function-level and module-level docstrings automatically</li> <li>• To evaluate the quality and accuracy of AI-generated documentation</li> <li>• To develop a small automated documentation generator in Python</li> </ul>	
1	<p><b>Lab Outcomes (LOs)</b></p> <p>After completing this lab, students will be able to:</p> <ul style="list-style-type: none"> <li>• Apply AI-assisted coding tools to generate docstrings and inline comments</li> <li>• Analyze AI-generated documentation for correctness and readability</li> <li>• Create structured documentation using standard formats (Google, NumPy)</li> <li>• Design a mini documentation generation tool</li> </ul> <p><b>Task 1: Basic Docstring Generation</b></p> <p><b>Scenario</b></p> <p>You are developing a utility function that processes numerical lists and must be properly documented for future maintenance.</p> <p><b>Prompt :</b> Create a Python function named <code>sum_even_odd(numbers)</code> that takes a list of integers and returns a tuple containing the sum of even numbers and sum of odd numbers.</p> <p><b>1. First, write the function with a manually written Google Style docstring including:</b></p> <ul style="list-style-type: none"> <li>- Description</li> <li>- Args</li> <li>- Returns</li> <li>- Example</li> </ul> <p><b>2. Then generate an AI-style Google docstring for the same function separately (without changing logic).</b></p>	Week4 - Wednesday





1. First, manually write NumPy Style docstrings for each function including:
    - Parameters
    - Returns
    - Raises (for divide by zero)
    - Example
  2. Then generate:
    - A module-level docstring
    - AI-generated NumPy Style function-level docstrings (without modifying function logic)
  3. Provide a structured comparison evaluating:
    - Structure
    - Accuracy
    - Completeness
    - Readability
    - Professional quality

**Ensure the code runs without errors.**

**Code :**

The screenshot shows a Python code editor with several tabs open. The active tab is `task3.py`, which contains the following code:

```
Assignment-9.3.py > task3.py ...
1 """
2     Calculator module providing basic arithmetic operations.
3
4     This module contains four fundamental arithmetic functions: addition, subtraction,
5     multiplication, and division. Each function accepts two numeric arguments and returns
6     the result of the respective operation. The divide function includes error handling
7     for division by zero.
8
9     Functions
10 -----
11     add : Add two numbers
12     subtract : Subtract second number from first
13     multiply : Multiply two numbers
14     divide : Divide first number by second with zero-check
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## 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

## **Expected Output**

- Python script with manual NumPy-style docstrings
  - AI-generated module-level and function-level documentation
  - Comparison between AI-generated and manual documentation
  - Clear understanding of structured documentation for multi-function scripts

**Explanation :** In this task, we create a calculator module with functions add, subtract, multiply, and divide. Manual NumPy Style docstrings are written for each function, including parameters, returns, raises, and examples. Then AI-generated docstrings and a module-level docstring are created. Finally, we compare manual vs AI docstrings based on

	structure, accuracy, completeness, readability, and professional quality.	
	<p><b>Additional Requirement</b></p> <ul style="list-style-type: none"><li>• Push the complete project documentation as a <b>.md file</b> to a GitHub repository</li><li>• Ensure documentation covers module overview and function descriptions</li></ul> <p><b>Note:</b> Report should be submitted a word document for all tasks in a single document with prompts, comments &amp; code explanation, and output and if required, screenshots</p>	