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| **SCHOOL OF COMPUTER SCIENCE AND ARTIFICIAL INTELLIGENCE** | | | | | **DEPARTMENT OF COMPUTER SCIENCE ENGINEERING** | | | | |
| **Program Name:** M. Tech/MCA | | | | **Assignment Type: Lab** | | | **AcademicYear:**2025-2026 | | |
| **Course Coordinator Name** | | | | Venkataramana Veeramsetty | | | | | |
| **Course Code** | | |  | **Course Title** | | AI Assisted Problem Solving Using Python | | | |
| **Year/Sem** | | | I/I | **Regulation** | | R24 | | | |
| **Date and Day**  **of Assignment** | | | Week1 - TUESDAY | **Time(s)** | |  | | | |
| **Duration** | | | 2 Hours | **Applicable to**  **Batches** | | M. Tech/MCA | | | |
| **AssignmentNumber:2.3**(Present assignment number)/**24**(Total number of assignments) | | | | | | | | | |
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|  | **Q.No.** | **Question** | | | | | | ***Expected Time***  ***to complete*** |  |
|  | 1 | Lab 2: Exploring Additional AI Coding Tools – Gemini (Colab) and Cursor AI  **Lab Objectives:**   * To explore and evaluate the functionality of Google Gemini for AI-assisted coding within Google Colab. * To understand and use Cursor AI for code generation, explanation, and refactoring. * To compare outputs and usability between Gemini, GitHub Copilot, and Cursor AI. * To perform code optimization and documentation using AI tools.   **Lab Outcomes (LOs):**  After completing this lab, students will be able to:   * Generate Python code using Google Gemini in Google Colab. * Analyze the effectiveness of code explanations and suggestions by Gemini. * Set up and use Cursor AI for AI-powered coding assistance. * Evaluate and refactor code using Cursor AI features. * Compare AI tool behavior and code quality across different platforms.   **Task Description#1**   * Use Google Gemini in Colab to write a function that reads a CSV file and calculates mean, min, max.   **Expected Output#1**   * Functional code with output and screenshot       **Task Description#2**   * Compare Gemini and Copilot outputs for a palindrome check function.   **Expected Output#2**   * Side-by-side comparison and observations     **Task Description#3**   * Ask Gemini to explain a Python function (to calculate area of various shapes) line by line..   **Expected Output#3**   * Detailed explanation with code snippet     **Prompt Used:** **Explain the area\_of\_shape function line by line in simple language.**  **OutPut:**   1. **import math: This line imports the math module, which provides access to mathematical functions, including math.pi for calculating the area of a circle.** 2. **def area\_of\_shape(shape: str, \*\*kwargs):: This line defines a function called area\_of\_shape. It takes two arguments:**    * **shape: This is a string that represents the type of shape (e.g., 'circle', 'rectangle', 'triangle'). The : str part is a type hint indicating that shape is expected to be a string.**    * **\*\*kwargs: This allows the function to accept a variable number of keyword arguments. This is useful because different shapes require different parameters (e.g., a circle needs a radius, while a rectangle needs width and height). These keyword arguments will be stored in a dictionary.** 3. **""" ... """: This is a docstring, which explains what the function does, its parameters, and what it returns. It's good practice to include docstrings to make your code easier to understand.** 4. **shape = shape.lower(): This line converts the input shape string to lowercase. This makes the function case-insensitive, so it will work correctly whether you input "Circle", "circle", or "CIRCLE".** 5. **if shape == 'circle':: This is the start of a conditional block that checks if the shape is 'circle'.** 6. **r = kwargs.get('radius'): If the shape is 'circle', this line attempts to get the value associated with the keyword argument 'radius' from the kwargs dictionary. If 'radius' is not provided, it will return None.** 7. **if r is None:: This checks if the radius was provided.** 8. **raise ValueError("Circle requires 'radius'"): If radius was not provided, this line raises a ValueError with an informative message, indicating that the function cannot calculate the area of a circle without a radius.** 9. **return math.pi \* (r \*\* 2): If a radius was provided, this line calculates the area of the circle using the formula π \* r² and returns the result. math.pi provides the value of pi, and r \*\* 2 calculates the radius squared.** 10. **elif shape == 'rectangle':: This is another conditional block that checks if the shape is 'rectangle'.**   **Task Description#4**   * Install and configure Cursor AI. Use it to generate a Python function (e.g., sum of squares).   **Expected Output#4**   * Screenshots of working environments with few prompts to generate python code     **Task Description#5**   * Student need to write code to calculate sum of add number and even numbers in the list   **Expected Output#5**   * Refactored code written by student with improved logic     **Note: Report should be submitted a word document for all tasks in a single document with prompts, comments & code explanation, and output and if required, screenshots**  **Evaluation Criteria:**   | **Criteria** | **Max Marks** | | --- | --- | | Successful Use of Gemini in Colab (Task#1 & #2) | 2.5 | | Code Explanation Accuracy (Gemini) (Task#3) | 2.5 | | Cursor AI Setup and Usage (Task#4) | 2.5 | | Refactoring and Improvement Analysis (Task#5) | 2.5 | | **Total** | **10 Marks** | | | | | | | Week1 - TuesDay |  |