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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** | | | Week3 - Tuesday | **Time(s)** | |  | | | |
| **Duration** | | | 2 Hours | **Applicable to**  **Batches** | | **M**. Tech/MCA | | | |
| **AssignmentNumber:5.3**(Present assignment number)/**24**(Total number of assignments) | | | | | | | | | |
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|  | **Q.No.** | **Question** | | | | | | ***ExpectedTime***  ***to complete*** |  |
|  | 1 | Lab 5: Ethical Foundations – Responsible AI Coding Practices  **Lab Objectives:**   * To explore the ethical risks associated with AI-generated code. * To recognize issues related to security, bias, transparency, and copyright. * To reflect on the responsibilities of developers when using AI tools in software development. * To promote awareness of best practices for responsible and ethical AI coding.   **Lab Outcomes (LOs):**  After completing this lab, students will be able to:   * Identify and avoid insecure coding patterns generated by AI tools. * Detect and analyze potential bias or discriminatory logic in AI-generated outputs. * Evaluate originality and licensing concerns in reused AI-generated code. * Understand the importance of explainability and transparency in AI-assisted programming. * Reflect on accountability and the human role in ethical AI coding practices.   **Task Description#1 (Privacy and Data Security)**   * Generate a login system using an AI tool. Analyze if the AI inserts hardcoded credentials or insecure logic.   Prompt: Generate a python login system . Analyze if the inserts hardcoded credentials or insecure logic.  Code:                **Expected Output#1**   * Description of risks and revised secure version     **Task Description#2 (Bias)**   * Use prompt variations like “loan approval system” with different genders/names. Analyze if AI suggests biased logic.   Prompt: generate a python program for “loan approval system” with different genders/names. Analyze if AI suggests biased logic  Code:            **Expected Output#2**   * Identification of bias (if any) and mitigation ideas     **Task Description#3 (Transparency)**   * Write prompt to write function calculate the nth Fibonacci number using recursion and generate comments and explain code document   Prompt: Write the python program to calculate the nth fibonacci number using recursion and generate commands and explain code shortly.  **Code:**    **Expected Output#3**   * Code with explanation * **Assess: Is the explanation understandable and correct?**   **Code explanation:**  Overview  This program calculates the nth Fibonacci number using recursion. The Fibonacci sequence is: 0, 1, 1, 2, 3, 5, 8, 13, 21, 34, ...  Function: fibonacci\_recursive(n)  Lines 3-20: Recursive function definition  def fibonacci\_recursive(*n*: int) -> int:   * Takes an integer n (position in the sequence) * Returns the nth Fibonacci number   Line 7-9: Input validation  *if* n < 0:  *raise* ValueError("n must be a non-negative integer")   * Rejects negative inputs * Prevents invalid recursion   Line 11-13: Base case 1  *if* n == 0:  *return* 0   * Returns 0 for F(0) * Stops recursion for n=0   Line 15-17: Base case 2  *if* n == 1:  *return* 1   * Returns 1 for F(1) * Stops recursion for n=1   Line 19-20: Recursive case  *return* fibonacci\_recursive(n - 1) + fibonacci\_recursive(n - 2)   * Computes F(n) = F(n-1) + F(n-2) * Calls itself twice with smaller values * Continues until base cases are reached   Main program  Lines 23-29: Program entry point  Line 23: Main block  *if* \_\_name\_\_ == "\_\_main\_\_":   * Runs only when the script is executed directly   Line 25-27: User input and calculation  *try*:      n = int(input("Enter n (non-negative integer): "))      print(f"F({n}) = {fibonacci\_recursive(n)}")   * Prompts for n * Converts to integer * Calls the function and prints the result   Line 28-29: Error handling  *except* ValueError *as* exc:      print(f"Error: {exc}")   * Handles invalid input (non-integer or negative) * Prints the error message   How recursion works  Example: F(5)  fibonacci\_recursive(5)      ↓  fibonacci\_recursive(4) + fibonacci\_recursive(3)      ↓                    ↓  fibonacci\_recursive(3) + fibonacci\_recursive(2)      ↓                    ↓  fibonacci\_recursive(2) + fibonacci\_recursive(1)      ↓                    ↓  fibonacci\_recursive(1) + fibonacci\_recursive(0)      ↓                    ↓      1                    0      ↓  Returns: 1 + 0 = 1      ↓  Returns: 1 + 1 = 2      ↓  Returns: 2 + 1 = 3      ↓  Returns: 3 + 2 = 5  Step-by-step:   1. F(5) calls F(4) and F(3) 2. F(4) calls F(3) and F(2) 3. F(3) calls F(2) and F(1) 4. F(2) calls F(1) and F(0) 5. F(1) returns 1 (base case) 6. F(0) returns 0 (base case) 7. Values propagate back up: 1, 1, 2, 3, 5   Output:    **Task Description#4 (Bias)**   * Ask AI to generate a scoring system for job applicants based on features.   Prompt: Generate Python program for scoring system for job applicants based on futures and analyze gender bias or any  Code:          **Expected Output#4**   * Python code * Analyze is there any bias with respect to gender or any     **Task Description#5 (Inclusiveness)**   * Code Snippet     **Expected Output#5**   * Regenerate code that includes **gender-neutral** also   Prompt: Generate a python program that includes gender-neutral  Code:      **Output:**    **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** | | --- | --- | | Transparency | 2.5 | | Bias | 2.5 | | Inclusiveness | 2.5 | | Data security and Privacy | 2.5 | | **Total** | 10 | | | | | | | Week3 - Tuesday |  |