|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **SCHOOLOFCOMPUTER SCIENCE AND ARTIFICIAL INTELLIGENCE** | | | | | **DEPARTMENTOFCOMPUTER SCIENCE ENGINEERING** | | | | |
| **ProgramName:**B. Tech | | | | **AssignmentType: Lab** | | | **AcademicYear:**2025-2026 | | |
| **CourseCoordinatorName** | | | | Venkataramana Veeramsetty | | | | | |
| **Instructor(s)Name** | | | | |  | | --- | | Dr. V. Venkataramana (Co-ordinator) | | Dr. T. Sampath Kumar | | Dr. Pramoda Patro | | Dr. Brij Kishor Tiwari | | Dr.J.Ravichander | | Dr. Mohammand Ali Shaik | | Dr. Anirodh Kumar | | Mr. S.Naresh Kumar | | Dr. RAJESH VELPULA | | Mr. Kundhan Kumar | | Ms. Ch.Rajitha | | Mr. M Prakash | | Mr. B.Raju | | Intern 1 (Dharma teja) | | Intern 2 (Sai Prasad) | | Intern 3 (Sowmya) | | NS\_2 ( Mounika) | | | | | | |
| **CourseCode** | | | 24CS002PC215 | **CourseTitle** | | AI Assisted Coding | | | |
| **Year/Sem** | | | II/I | **Regulation** | | R24 | | | |
| **DateandDay**  **of Assignment** | | | Week7 - Thursday | **Time(s)** | |  | | | |
| **Duration** | | | 2 Hours | **Applicableto**  **Batches** | |  | | | |
| **AssignmentNumber:13.1**(Presentassignmentnumber)/**24**(Totalnumberofassignments) | | | | | | | | | |
|  | | | | | | | | | |
|  | **Q.No.** | **Question** | | | | | | ***ExpectedTime***  ***to complete*** |  |
|  | 1 | **Lab 13: Code Refactoring – Improving Legacy Code with AI Suggestions**  **Lab Objectives:**   * Identify code smells and inefficiencies in legacy Python scripts. * Use AI-assisted coding tools to **refactor** for readability, maintainability, and performance. * Apply **modern Python best practices** while ensuring output correctness.   **Task 1**   * **Task:** Refactor repeated loops into a cleaner, more Pythonic approach.   **Instructions:**   * Analyze the legacy code. * Identify the part that uses loops to compute values. * Refactor using **list comprehensions** or helper functions while keeping the output the same. **Legacy Code:**   numbers = [1, 2, 3, 4, 5]  squares = []  for n in numbers:  squares.append(n \*\* 2)  print(squares)  **Expected Output:**  [1, 4, 9, 16, 25]  **Task 2**  **Task:** Simplify string concatenation. **Instructions:**   * Review the loop that builds a sentence using +=. * Refactor using " ".join() to improve efficiency and readability. **Legacy Code:**   words = ["AI", "helps", "in", "refactoring", "code"]  sentence = ""  for word in words:  sentence += word + " "  print(sentence.strip())  **Expected Output:**  AI helps in refactoring code  **Task 3**  **Task:** Replace manual dictionary lookup with a safer method. **Instructions:**   * Check how the code accesses dictionary keys. * Use .get() or another Pythonic approach to handle missing keys gracefully. **Legacy Code:**   student\_scores = {"Alice": 85, "Bob": 90}  if "Charlie" in student\_scores:  print(student\_scores["Charlie"])  else:  print("Not Found")  **Expected Output:**  Not Found  **Task 4**  **Task:** Refactor repetitive if-else blocks. **Instructions:**   * Examine multiple if-elif statements for operations. * Refactor using **dictionary mapping** to make the code scalable and clean. **Legacy Code:**   operation = "multiply"  a, b = 5, 3  if operation == "add":  result = a + b  elif operation == "subtract":  result = a - b  elif operation == "multiply":  result = a \* b  else:  result = None  print(result)  **Expected Output:**  15  Top of Form**Task 5**  **Task:** Optimize nested loops for searching. **Instructions:**   * Identify the nested loop used to find an element. * Refactor using Python’s in keyword or other efficient search techniques. **Legacy Code:**   items = [10, 20, 30, 40, 50]  found = False  for i in items:  if i == 30:  found = True  break  print("Found" if found else "Not Found")  **Expected Output:**  Found | | | | | | Week7 - Thursday |  |