|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **SCHOOL OF COMPUTER 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** | | | Week4 - Thursday | **Time(s)** | |  | | | |
| **Duration** | | | 2 Hours | **Applicableto**  **Batches** | |  | | | |
| **AssignmentNumber:7.4**(Presentassignmentnumber)/**24**(Totalnumberofassignments) | | | | | | | | | |
|  | | | | | | | | | |
|  | | | | | | | | | |
|  | **Q.No.** | **Question** | | | | | | ***ExpectedTime***  ***to complete*** |  |
|  | 1 | Lab 7: Error Debugging with AI – Systematic Approaches to Finding and Fixing Bugs  Lab Objectives:   * To identify and correct syntax, logic, and runtime errors in Python programs using AI tools. * To understand common programming bugs and AI-assisted debugging suggestions. * To evaluate how AI explains, detects, and fixes different types of coding errors. * To build confidence in using AI to perform structured debugging practices.   Lab Outcomes (LOs):  After completing this lab, students will be able to:   * Use AI tools to detect and correct syntax, logic, and runtime errors. * Interpret AI-suggested bug fixes and explanations. * Apply systematic debugging strategies supported by AI-generated insights. * Refactor buggy code using responsible and reliable programming patterns.   **Task Description #1:**  • Introduce a buggy Python function that calculates the factorial of a number using recursion. Use Copilot or Cursor AI to detect and fix the logical or syntax errors.    **Expected Outcome #1:**  **•**Copilot or Cursor AI correctly identifies missing base condition or incorrect recursive call and suggests a functional factorial implementation.  *here are three mistakes in the code:*   1. *The base case for*[*n == 0*](vscode-file://vscode-app/c:/Users/keesa/AppData/Local/Programs/Microsoft%20VS%20Code/resources/app/out/vs/code/electron-browser/workbench/workbench.html)*should return 1, not 0, because 0! = 1.* 2. *The function is called with a string "5" instead of an integer. It should be called with 5 (without quotes)* 3. *It should be n-1 not n-1*   **In VS Code:**    **In Cursor:**    **Task Description #2:**  **•**Provide a list sorting function that fails due to a type error (e.g., sorting list with mixed integers and strings). Prompt AI to detect the issue and fix the code for consistent sorting**.**    **Expected Outcome #2:**  **•**AI detects the type inconsistency and either filters or converts list elements, ensuring successful sorting without a crash.  *mistake: the list mixes int and str ([3,"apple",1,"banana",2]). In Python 3, sorted can’t compare different types → TypeError.*  **In Cursor:**    **In VS Code:**    **Task Description #3:**  **•** Write a Python snippet for file handling that opens a file but forgets to close it. Ask Copilot or Cursor AI to improve it using the best practice (e.g., with open() block).  **Code1**    **Code2**    **Code3**    **Code4:**    **Expected Outcome #3:**  **•** AI refactors the code to use a context manager, preventing resource leakage and runtime warnings.  **In Cursor:**    **In VS Code:**    **Task Description #4:**  **•** Provide a piece of code with a ZeroDivisionError inside a loop. Ask AI to add error handling using try-except and continue execution safely.    **Expected Outcome #4:**  **•** Copilot adds a try-except block around the risky operation, preventing crashes and printing a meaningful error message.  *mistakes:*   * *Function name typo in call: computer\_ratios → compute\_ratios.* * *Division by zero when j == i (denominator values[j] - values[i] is 0).* * *Also divides by zero if any two values are equal.*   **In Cursor:**    **In VS Code:**    **Task Description #5:**  **•** Include a buggy class definition with incorrect \_\_init\_\_ parameters or attribute references. Ask AI to analyze and correct the constructor and attribute usage.  class StudentRecord:  def \_\_init\_\_(self, name, id, courses=[]):  self.studentName = names  self.student\_id = id  self.courses = courseList  def add\_course(self, course):  self.courses.append(course)  def get\_summary(self):  return f"Student: {self.studentName}, ID: {self.student\_id}, Courses: {', '.join(self.courses)}"  class Department:  def \_\_init\_\_(self, deptName, students=None):  self.dept\_name = deptName  self.students = students  def enroll\_student(self, student):  self.students.append(student)  def department\_summary(self):  return f"Department: {self.dept\_name}, Total Students: {len(self.student)}"    s1 = StudentRecord("Alice", 101, ["Math", "Science"])  d1 = Department("Computer Science")  d1.enroll\_student(s1)  print(s1.get\_summary())  print(d1.department\_summary())  **Expected Outcome #5:**  **•** Copilot identifies mismatched parameters or missing self references and rewrites the class with accurate initialization and usage.  Errors:   * ***Undefined variables****: names and courseList used instead of parameters name and courses.* * ***Mutable default arg****: courses=[] should be None and set to [] inside.* * ***Department students init****: students=None is fine, but you must replace None with [].* * ***Attribute typo****: department\_summary uses self.student instead of self.students.* * ***Potential name shadowing****: parameter id shadows built-in id (not a runtime error but best avoided).*   **In Cursor:**    **In VS Code:** | | | | | | Week4 - Thursday |  |