Name: B.NITHIN HallTicket No.2303A51803 Batch-26

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| **SCHOOL OF COMPUTER SCIENCE AND ARTIFICIAL INTELLIGENCE** | | | | | **DEPARTMENT OF COMPUTER SCIENCE ENGINEERING** | | | | |
| **Program Name:**B. Tech | | | | **Assignment Type: Lab** | | | **Academic Year:**2025-2026 | | |
| **Course Coordinator Name** | | | | Dr. Rishabh Mittal | | | | | |
| **Instructor(s)Name** | | | | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | | |  | | --- | | Mr. S Naresh Kumar | | Ms. B. Swathi | | Dr. Sasanko Shekhar Gantayat | | Mr. Md Sallauddin | | Dr. Mathivanan | | Mr. Y Srikanth | | Ms. N Shilpa | | Dr. Rishabh Mittal (Coordinator) | | Dr. R. Prashant Kumar | | Mr. Ankushavali MD | | Mr. B Viswanath | | Ms. Sujitha Reddy | | Ms. A. Anitha | | Ms. M.Madhuri | | Ms. Katherashala Swetha | | Ms. Velpula sumalatha | | Mr. Bingi Raju | | Mr. G. Kranthi | | | | | | | |
| **Course Code** | | | 23CS002PC304 | **Course Title** | | AI Assisted Coding | | | |
| **Year/Sem** | | | III/I | **Regulation** | | R23 | | | |
| **Date and Day**  **of Assignment** | | | Week 5 - Thursday | **Time(s)** | | 23CSBTB01 To 23CSBTB52 | | | |
| **Duration** | | | 2 Hours | **Applicable to**  **Batches** | | All Batches | | | |
| **AssignmentNumber:10.4** (Present assignment number)/**24**(Total number of assignments) | | | | | | | | | |
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|  | **Q.No.** | **Question** | | | | | | ***ExpectedTime***  ***to complete*** |  |
|  | 1 | **Lab 9 – Code Review and Quality: Using AI to Improve Code Quality and Readability**  **Lab Objectives**   * Use AI for automated code review and quality enhancement. * Identify and fix syntax, logical, performance, and security issues in Python code. * Improve readability and maintainability through structured refactoring and comments. * Apply prompt engineering for targeted improvements. * Evaluate AI-generated suggestions against PEP 8 standards and software engineering best practices | | | | | | Week 5 |  |
|  |  | **Task 1: AI-Assisted Syntax and Code Quality Review**  **Scenario**  You join a development team and are asked to review a junior developer’s Python script that fails to run correctly due to basic coding mistakes. Before deployment, the code must be corrected and standardized.  **Task Description**  You are given a Python script containing:   * Syntax errors * Indentation issues * Incorrect variable names * Faulty function calls   Use an AI tool (GitHub Copilot / Cursor AI) to:   * Identify all syntactic and structural errors * Correct them systematically * Generate an explanation of each fix made   **Expected Outcome**   * Fully corrected and executable Python code * AI-generated explanation describing:   + Syntax fixes   + Naming corrections   + Structural improvements * Clean, readable version of the script     **Task 2: Performance-Oriented Code Review**  **Scenario**  A data processing function works correctly but is inefficient and slows down the system when large datasets are used.  **Task Description**  You are provided with a function that identifies duplicate values in a list using inefficient nested loops.  Using AI-assisted code review:   * Analyze the logic for performance bottlenecks * Refactor the code for better time complexity * Preserve the correctness of the output   Ask the AI to explain:   * Why the original approach was inefficient * How the optimized version improves performance   **Expected Outcome**   * Optimized duplicate-detection logic (e.g., using sets or hash-based structures) * Improved time complexity * AI explanation of performance improvement * Clean, readable implementation     **Task 3: Readability and Maintainability Refactoring**  **Scenario**  A working script exists in a project, but it is difficult to understand due to poor naming, formatting, and structure. The team wants it rewritten for long-term maintainability.  **Task Description**  You are given a poorly structured Python function with:   * Cryptic function names * Poor indentation * Unclear variable naming * No documentation   Use AI-assisted review to:   * Refactor the code for clarity * Apply PEP 8 formatting standards * Improve naming conventions * Add meaningful documentation   **Expected Outcome**   * Clean, well-structured code * Descriptive function and variable names * Proper indentation and formatting * Docstrings explaining the function purpose * AI explanation of readability improvements     **Task 4: Secure Coding and Reliability Review**  **Scenario**  A backend function retrieves user data from a database but has security vulnerabilities and poor error handling, making it unsafe for production deployment.  **Task Description**  You are given a Python script that:   * Uses unsafe SQL query construction * Has no input validation * Lacks exception handling   Use AI tools to:   * Identify security vulnerabilities * Refactor the code using safe coding practices * Add proper exception handling * Improve robustness and reliability   **Expected Outcome**   * Secure SQL queries using parameterized statements * Input validation logic * Try-except blocks for runtime safety * AI-generated explanation of security improvements * Production-ready code structure     **Task 5: AI-Based Automated Code Review Report**  **Scenario**  Your team uses AI tools to perform automated preliminary code reviews before human review, to improve code quality and consistency across projects.  **Task Description**  You are provided with a poorly written Python script.  Using AI-assisted review:   * Generate a **structured code review report** that evaluates:   + Code readability   + Naming conventions   + Formatting and style consistency   + Error handling   + Documentation quality   + Maintainability   The task is not just to fix the code, but to **analyze and report on quality issues**.  **Expected Outcome**   * AI-generated review report including:   + Identified quality issues   + Risk areas   + Code smell detection   + Improvement suggestions * Optional improved version of the code * Demonstration of AI as a **code reviewer**, not just a code generator   **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** | | | | | |  |  |