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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 | | | | | | |
| **CourseCode** | | | 23CS002PC304 | **Course Title** | | AI Assisted Coding | | | |
| **Year/Sem** | | | III/II | **Regulation** | | R23 | | | |
| **Date and Day**  **of Assignment** | | | **Week2 – Monday** | **Time(s)** | | 23CSBTB01 To 23CSBTB52 | | | |
| **Duration** | | | 2 Hours | **Applicable to**  **Batches** | | All batches | | | |
| **Assignment Number: 4.1**(Present assignment number)/**24**(Total number of assignments) | | | | | | | | | |
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|  | **Q.No.** | **Question** | | | | | | ***Expected Time***  ***to complete*** |  |
|  | 1 | **Lab 4: Advanced Prompt Engineering – Zero-shot, One-shot, and Few-shot Techniques**  **Lab Objectives:**   * To explore and apply different levels of prompt examples in AI-assisted code generation. * To understand how zero-shot, one-shot, and few-shot prompting affect AI output quality. * To evaluate the impact of context richness and example quantity on AI performance.   **Lab Outcomes (LOs):**  After completing this lab, students will be able to:   * Use zero-shot prompting to instruct AI with minimal context. * Use one-shot prompting with a single example to guide AI code generation. * Apply few-shot prompting using multiple examples to improve AI responses. * Compare AI outputs across the three prompting strategies.   **Analyze the sample example problem and complete the given problem statement 1,2**  **Advanced Prompt Engineering – Topic Classification of News Headlines**  **Sample Example Problem:**  **Problem Statement 0:**  A news aggregation platform wants to automatically categorize headlines into Politics, Sports, Technology, and Entertainment without training a machine learning model.  **Tasks to be Completed**   1. Prepare Sample Data Collect 10 news headlines, each belonging to one of the four categories. 2. Zero-shot Prompting Write a prompt asking the LLM to classify a headline into a category without examples. 3. One-shot Prompting Add one labeled headline example before classifying a new headline. 4. Few-shot Prompting Use 3–5 labeled headlines in the prompt before requesting classification. 5. Evaluation Compare outputs from all three prompting methods using the same test headlines and document observation   **Sample Solution for problem statement 0:**  **1. Sample News Headlines**   | **No.** | **News Headline** | **Category** | | --- | --- | --- | | H1 | Government announces new education policy | Politics | | H2 | Parliament passes new tax reform bill | Politics | | H3 | India wins the T20 cricket series | Sports | | H4 | Football club signs a new international player | Sports | | H5 | Tech company launches a new AI-powered smartphone | Technology | | H6 | Cybersecurity firm reports major data breach | Technology | | H7 | Upcoming movie breaks box office records | Entertainment | | H8 | Popular actor announces next film project | Entertainment |   **2. Zero-shot Prompting**  Prompt Used:  Classify the following news headline into one of these categories: Politics, Sports, Technology, Entertainment. Headline: “India wins the T20 cricket series.”  **Output:**  Sports  **Observation:** The model correctly classified the headline without using any example.  **3. One-shot Prompting**  Prompt Used:  Example: Headline: “Government announces new education policy” Category: Politics  Now classify the following headline into Politics, Sports, Technology, or Entertainment. Headline: “Tech company launches a new AI-powered smartphone.”  **Output:**  Technology  **Observation:** Providing one example improved clarity and consistency in classification.  **4. Few-shot Prompting**  Prompt Used:  Example 1: Headline: “Parliament passes new tax reform bill” Category: Politics  Example 2: Headline: “Football club signs a new international player” Category: Sports  Example 3: Headline: “Cybersecurity firm reports major data breach” Category: Technology  Example 4: Headline: “Upcoming movie breaks box office records” Category: Entertainment  Now classify the following headline into Politics, Sports, Technology, or Entertainment. Headline: “Popular actor announces next film project.”  Output:  Entertainment  Observation: Few-shot prompting produced the most accurate and confident response | | | | | | Week2 - Monday |  |
|  | **Problem Statement1** | **Customer Email Classification**  A company receives a large number of customer emails every day and wants to automatically classify them into the following categories:   * Billing * Technical Support * Feedback * Others   Instead of training a new machine learning model, the company decides to use prompt engineering techniques with an existing large language model.  **Tasks**   1. Prepare five short sample emails, each belonging to one of the above categories. 2. Write a zero-shot prompt to classify a given email into one of the categories without providing any examples. 3. Write a one-shot prompt by including one labeled email example and ask the model to classify a new email. 4. Write a few-shot prompt by including two or three labeled email examples and ask the model to classify a new email. 5. Compare the outputs obtained using zero-shot, one-shot, and few-shot prompting techniques and briefly comment on their effectiveness | | | | | |  |  |
|  | **Problem Statement 2** | **Intent Classification for Chatbot Queries**  A company wants to deploy a chatbot to handle customer queries. Each query must be classified into one of the following intents: Account Issue, Order Status, Product Inquiry, or General Question using prompt engineering techniques.  **Tasks to be Completed**   1. Prepare Sample Data Create 6 short chatbot user queries, each mapped to one of the four intents. 2. Zero-shot Prompting Design a prompt that asks the LLM to classify a user query into the given intent categories without examples. 3. One-shot Prompting Provide one labeled query in the prompt before classifying a new query. 4. Few-shot Prompting Include 3–5 labeled intent examples to guide the LLM before classifying a new query. 5. Evaluation Apply all three techniques to the same set of test queries and document differences in performance. | | | | | |  |  |
|  | **Problem Statement 3** | **Student Feedback Analysis**  A university collects student feedback and wants to categorize comments as Positive, Negative, or Neutral.  Questions:  a) Write a Zero-shot prompt to classify feedback sentiment. b) Provide a One-shot prompt with one feedback example. c) Create a Few-shot prompt using multiple labeled feedback samples. d) Explain how examples improve sentiment classification accuracy. | | | | | |  |  |
|  | **Problem Statement 4** | **Course Recommendation System**  An online learning platform wants to recommend courses by classifying learner queries into Beginner, Intermediate, or Advanced levels.  Questions: a) Write a Zero-shot prompt to classify learner queries. b) Create a One-shot prompt with one example query. c) Develop a Few-shot prompt with multiple labeled queries. d) Discuss how Few-shot prompting improves recommendation quality. | | | | | |  |  |
|  | **Problem Statement 5** | **Social Media Post Moderation**  A social media platform wants to classify posts into Acceptable, Offensive, or Spam.  Questions: a) Write a Zero-shot prompt for post moderation. b) Convert it into a One-shot prompt. c) Design a Few-shot prompt using multiple examples. d) Explain the challenges of Zero-shot prompting in content moderation. | | | | | |  |  |