Assignment 9: Chatbot Report

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1. Assignment Overview

The chatbot was developed to assist users by providing accurate responses to frequently asked questions. Two implementations were created:

- AI-powered chatbot using the Gemini API.
- Rule-based chatbot using predefined question-answer pairs.

2. AI-Based Chatbot (Gemini API)

The first chatbot uses Google's Generative AI model. The process includes:

- Importing necessary libraries from google.generativeai.
- Reading context from a description file to build a knowledge base.
- Creating prompts using a function that embeds user questions into the knowledge base.
- Sending the prompt to the Gemini model and receiving AI-generated responses.
- Handling exit commands such as 'quit', 'exit', or 'bye' to end the chat.

3. Core Features

- Context Awareness: The chatbot only answers based on the knowledge base.
- Error Handling: Responds with a fallback message if the answer is unavailable.
- API Integration: Uses API keys for secure communication with the Gemini model.

4. Rule-Based FAQ Chatbot

The second chatbot is a simpler implementation that does not rely on external APIs. It uses a list of predefined questions and answers stored in a knowledge base. The chatbot works by comparing user input with stored questions using string similarity.

5. How It Works

- Normalizes user input by converting to lowercase and removing extra spaces.
- Uses SequenceMatcher to calculate similarity between queries.
- If similarity is above a threshold, it returns the best-matched answer.
- If not, it responds with a low-confidence message.

6. Exit Commands

Both chatbots include exit commands such as 'quit', 'exit', or 'bye' to safely terminate the conversation.

7. Conclusion

Through these two chatbot approaches, I learned how to integrate AI models using APIs and how to create simple rule-based systems. This project helped me understand prompt design, context handling, and user interaction. The AI-based chatbot offers flexibility, while the rule-based chatbot provides stability and control.