Technical Assignment: Creating a Chatbot using RAG Architecture

Instructions:

This technical assignment is designed to evaluate your proficiency in using the Gemini pro model and a vector database to develop a chatbot using the RAG (Retriever-Reader-Generator) architecture.

You are required to complete the tasks outlined below within the given time frame.

Ensure your solution meets the specified technical requirements.

You are allowed to use any resources available to you.

Task 1: Data Reading Capability

Develop a chatbot with the capability to read data from various sources including video, web, and text. Your chatbot should be able to process and understand information retrieved from these sources.

Task 2: Building Blocks of RAG Architecture

Implement all the necessary building blocks of the RAG architecture to create a functional chatbot.

Task 3: Vector Database Functionality

Integrate a vector database into your chatbot with the following functionalities:

Insert: Ability to add new data into the vector database.

View: Ability to view data stored in the vector database.

Delete: Ability to delete data entries from the vector database.

Update: Ability to update existing data entries in the vector database.

Task 4: Data Design Question Answering System

Utilize the Gemini pro model to develop a question-answering system. Your chatbot should be capable of providing a vector summary of the data and effectively answer design-related questions using Large Language Models (LLM) output.

Technical Requirements:

Framework Language: You must use one of the framework languages from the Langchain or Llama Index.

Vector Database: Your solution must incorporate a vector database with data tagging for efficient retrieval and management.

LLM Output Management: Ensure that the output from the Large Language Model is managed appropriately through prompt handling.

Submission Guidelines:

1. Write code in Jupyter Notebook (ipynb) format. Include all mentioned points, data insights, and outputs. Convert the notebook to PDF format for submission.

2. Describe your approach in a separate PDF document. Explain implementation of RAG architecture components and mentioned parameters.

Note: You are expected to complete this assignment within the allocated time frame.

Good luck!