AI Engineer (Level-1) — Technical Assessment

Develop a Simple Multilingual Retrieval-Augmented Generation (RAG) System

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Objective

Design and implement a basic RAG pipeline capable of understanding and responding to both English and Bengali queries. The system should fetch relevant information from a **pdf document** corpus and **generate** a meaningful answer grounded in retrieved content.

Core Task

- Build a basic RAG application that:
    - Accepts user queries in English and Bangla
    - Retrieves relevant document chunks from a small knowledge base
    - Generates answers based on the retrieved information
- Build a knowledge base
    - Use the following Bangla Book - HSC26 Bangla 1st paper
    - Proper Pre-Processing & data cleaning for better chunk accuracy
    - Document Chunking & Vectorize
- Maintain Long-Short term memory
    - "Short-Term" : Recent inputs in the chat sequence
    - "Long-Term" : Pdf document corpus in vector database

Sample Test Case:

User Question: অনুপমের ভাষায় সুপুরুষ কাকে বলা হয়েছে?
Expected Answer: শুম্‌ভুনাথ

User Question: কাকে অনুপমের ভাগ্য দেবতা বলে উল্লেখ করা হয়েছে?
Expected Answer: মামাকে

User Question: বিয়ের সময় কল্যাণীর প্রকৃত বয়স কত ছিল?
Expected Answer: ১৫ বছর

Bonus Tasks

- Simple Conversation API
    - Build a lightweight REST API to enable interaction with the RAG system.
    - Endpoint should accept user input and return model-generated responses.
- RAG Evaluation
    - Implement a basic evaluation of your RAG system using any of the following: You may use simple metrics (e.g., cosine similarity scores, human-labeled examples, etc.)
        - Groundedness (Is the answer supported by retrieved context?)
        - Relevance (Does the system fetch the most appropriate documents?)

Use Industry-Standard Tools and Practices .Tools & libraries are not limited to Langchain/Langflow/N8n/diffy/other. You can use any vector database (postgres/mongodb/pinecone/other) and LLM model (openai/gemini/mistrail/ollama/other).

Submission Requirements

- Source code (on GitHub Public Repo) & README file with:
- Setup guide
- Used tools,library,package
- Sample queries and outputs (Bangla & English)
- API Documentation (if implement)
- Evaluation Matrix (if implement)
- Must Answer following Questions
    - What method or library did you use to extract the text, and why? Did you face any formatting challenges with the PDF content?
    - What chunking strategy did you choose (e.g. paragraph-based, sentence-based, character limit)? Why do you think it works well for semantic retrieval?
    - What embedding model did you use? Why did you choose it? How does it capture the meaning of the text?
    - How are you comparing the query with your stored chunks? Why did you choose this similarity method and storage setup?
    - How do you ensure that the question and the document chunks are compared meaningfully? What would happen if the query is vague or missing context?
    - Do the results seem relevant? If not, what might improve them (e.g. better chunking, better embedding model, larger document)?