Frontend/Backend Assignment - Document Intelligence Platform

To grab the internship, you are required to complete a small assignment. Early submissions are given preference.

In this task, you are required to create a full-stack web application with AI/RAG integration.

Objective:

The goal of this assignment is to build a Document Intelligence Platform where users can upload documents (PDFs, Word docs, text files) and ask natural language questions about the content. The system should use RAG (Retrieval Augmented Generation) to provide accurate, contextual answer. Only the tech-stack mentioned in the assignment should be used.

Backend (Django REST Framework)

GET APIs:

- Retrieve all uploaded documents from the database

POST APIs:

- Uploading and processing documents (TXT)

- Asking questions about documents (RAG query endpoint)

Document Processing Engine

Create a Python module that handles document processing and RAG implementation:

Extra marks for handling multiple document formats, smart chunking strategies, and optimized embedding generation.

The system should:

- **Text Chunking**: Split documents into meaningful chunks (paragraphs, sections)
- **Embedding Generation**: Create vector embeddings for document chunks
- **Vector Storage**: Store embeddings in a vector database (ChromaDB or FAISS)
- **Similarity Search**: Find relevant chunks based on user queries
- **Answer Generation**: Use OpenAI/Anthropic API/LM Studio to generate contextual answers

Input Parameters for Questions:

- Document ID
- User question
- Number of relevant chunks to retrieve (default: 3-5)

RAG Pipeline Implementation:

The system should implement a complete RAG pipeline that:

- Generates embeddings for user questions

- Performs similarity search across document chunks

- Constructs relevant context from retrieved chunks

- Generates contextual answers using LLM with source citations

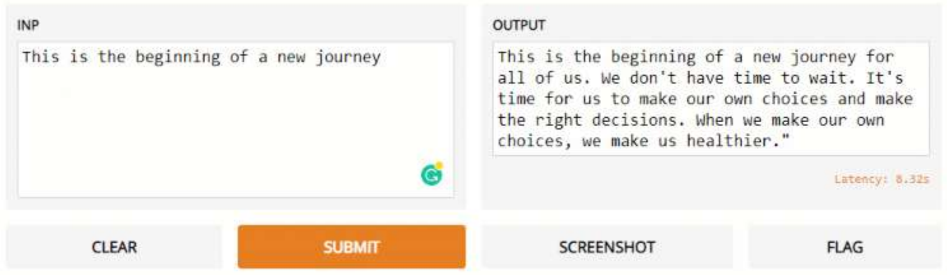
Frontend (ReactJS / NextJS with Tailwind CSS)

User Interface:

The frontend should be developed using ReactJS or NextJS, styled with Tailwind CSS.

Required Pages:

1. **Dashboard/Library Page**:
   - List all uploaded documents with title, pages count
2. **Q&A Interface**:
   - Question input
   - Answer display



This is the beginning of a new journey

This is the beginning of a new journey for all of us. We don't have time to wait. It's time for us to make our own choices and make the right decisions. When we make our own choices, we make us healthier."

Latency: 8.32s

3. **Upload Page**:
   - File upload interface

Database Schema Hints:

Design your database with the following tables structure:

Documents table: Store document metadata including title, file path, type, size, pages, processing status, and timestamps.

Document chunks table: Store processed text chunks with references to parent document, chunk index, page numbers, and embedding identifiers for vector database integration.

Tech Stack Requirements:

- **Backend**: Django REST Framework, Python
- **Database**: MySQL for metadata, ChromaDB/FAISS for vectors
- **Frontend**: ReactJS/NextJS with Tailwind CSS
- **File Storage**: Local storage
- **AI Integration**: OpenAI API, Claude API, or **LM Studio** (recommended if external APIs are not available)

AI Integration Options:

Option 1: Use external APIs (OpenAI, Anthropic Claude)

Option 2: Use LM Studio for local LLM hosting (recommended alternative)

LM Studio allows you to run language models locally without requiring external API keys. Download and set up LM Studio with models like Llama, Mistral, or Code Llama for document question-answering tasks. This provides a cost-effective solution and ensures data privacy.

Deadline

31 May, 2025, Friday, 11:55 PM

Submission Format

- Create a GitHub repository and add your code to it.
- In the README, add:
  - Screenshots of the UI you have created
  - Setup instructions for running the application
  - API documentation
  - Sample questions and answers from your system
- Include a requirements.txt file with all dependencies
- Add sample documents for testing
- Fill your repo link in this form: https://forms.gle/ZT6VZ1iW3ah91Gxu5.
- Make sure the code is neat and readable with proper comments.

Evaluation Criteria:

- **Functionality** (40%): Working RAG pipeline, accurate answers, proper citations
- **Code Quality** (25%): Clean, readable, well-structured code
- **UI/UX** (20%): User-friendly interface, responsive design
- **Innovation** (15%): Creative features, optimization techniques, error handling

Bonus Points (Optional):

- Support for multiple document formats (PDF, DOCX, TXT, MD)
- Advanced chunking strategies (semantic chunking, overlapping windows)
- Saving chat history
- Advanced search and filtering capabilities for the documents

For any doubts, feel free to drop a mail at devgods99@gmail.com We'll try to respond as soon as possible!

In case you're not able to complete it within the deadline, do submit the code even if a part of it doesn't work. The effort and skills you demonstrate through your code matter.

Note: An early submission will give you an advantage over others.

Helpful Resources:

- LM Studio: https://lmstudio.ai/ (for local LLM hosting)
- ChromaDB Documentation: https://docs.trychroma.com/
- Sentence Transformers: https://www.sbert.net/
- Django REST Framework: https://www.django-rest-framework.org/
- React File Upload: https://react-dropzone.js.org/