

Project Summary Report

AI Study Assistant for Quiz Question Generation

Objective

To develop a lightweight, user-friendly application that helps students and educators:

- Summarize study materials into concise, key points.
- Automatically generate multiple-choice quiz questions based on the summarized content.
- Operate without external retrieval mechanisms or vector databases, ensuring efficiency and simplicity.

Key Features

PDF Upload & Text Extraction:

Users can upload any PDF document containing study material. The app uses PyPDF2 to extract text from all pages of the PDF.

Automated Summarization:

The extracted text is summarized into clear, concise bullet points using a modern language model (Gemini 1.5 Flash) via LangChain.

Quiz Generation:

Based on the summary, the app generates 5 high-quality multiple-choice questions (MCQs), each with four options and a clearly indicated correct answer.

Interactive User Interface:

Built with Streamlit, the app provides an intuitive interface for uploading documents, viewing summaries, taking quizzes, and receiving instant feedback.

No External Vector DBs:

All processing is done in-memory and via API calls to the language model, with no need for external databases or retrieval systems.

Technologies Used

- **Python 3**
- **Streamlit** (for the web interface)
- **PyPDF2** (for PDF text extraction)
- **LangChain** and **langchain-google-genai** (for LLM integration)
- **Google Generative AI (Gemini 1.5 Flash)** (for summarization and quiz generation)

How It Works

1. **User uploads a PDF** containing study material.
2. **Text is extracted** from the PDF using PyPDF2.
3. **The app summarizes** the content into bullet points using the Gemini LLM.
4. **Quiz questions are generated** from the summary, formatted as MCQs.
5. **User takes the quiz** within the app and receives instant feedback and scoring.

Sample Workflow

Input:

A PDF on "Introduction to Artificial Intelligence."

Output:

- Bullet-point summary of AI concepts.
- 5 MCQs testing understanding of the summarized material.
- Interactive quiz interface with scoring and explanations.

Benefits:

- Saves time for students and educators by automating quiz creation.
- Ensures coverage of key concepts in study materials.

- Adaptable to any educational topic provided in PDF format.
- Lightweight and easy to deploy—no complex infrastructure required.

How to Run:

1. Install requirements:

```
`pip install -r requirements.txt`
```

2. Run the app:

```
`streamlit run app.py`
```

3. Open the app in your browser, upload a PDF, and start learning!

Conclusion

This project provides an efficient, modern solution for self-assessment and study review, leveraging the power of LLMs without the overhead of external retrieval systems. It is ideal for students, teachers, and lifelong learners seeking interactive, AI-powered study tools.