Makeathon Challenge

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From Lecture to Learning: Build a Smart Study Assistant

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1. From Lecture to Learning: Build a Smart Study Assistant

Background: In a world overflowing with information, students often find themselves overwhelmed by unstructured lecture content—whether it's from in-person classes, recorded videos, or shared notes. Important insights are lost in the noise, revision becomes inefficient, and personalized study paths feel out of reach.

Challenge: Build a tool that transforms lecture materials—audio, video, slides, or raw notes—into a structured, searchable, and interactive personal learning assistant.

Can you turn an one-hour lecture into something that's easy to revise, fun to explore, and effective to study from?

Whether it's generating concise notes, flashcards, mind maps, quizzes, or even enabling a chatbot to answer questions on the content—you have the flexibility to choose your angle. Go simple or go advanced—just make it impactful, usable, and smart.

1.1 Objectives

Your solution should aim to:

- ✓ Ingest various types of lecture input: audio, text, slides, etc.
- ✓ Extract and structure information into useful formats: notes, Q&A, summaries, timelines, flashcards, concept maps, etc. - any creative alternative is welcome!

Bonus Objectives (for deeper implementations):

- ✓ Auto-generate quizzes or concept-checks.
- ✓ Visualize knowledge (mind maps, timelines, key term graphs).
- ✓ Track learning progress.
- ✓ Multilingual or accessibility support (e.g., dyslexia-friendly notes).

1.2 Relevant Data or Tools

Suggested tools/APIs/datasets:

- ✓ Data Sources: Sample lecture recordings, transcripts, PDFs (provided), or public sources (e.g., MIT OpenCourseWare, YouTube lectures).
- ✓ Audio transcription: Whisper API, Google Speech-to-Text, Azure Speech-to-Text
- ✓ NLP: Google Gemini, OpenAI gpt, HuggingFace Transformers, SpaCy
- ✓ Frontend: React, Streamlit, or any UI framework
- ✓ Knowledge base: SQLite, FAISS, qdrant, chromadb, or other vector databases

1.3 Expected Deliverables

- ✓ Presentation – A brief but clear presentation (ppt or other) explaining:
  - The data used and how it was processed
  - Techniques and models applied (e.g., transcription, summarization, NLP)
  - System architecture and workflow
  - How the solution addresses the problem
  -
  - The value it provides to students and education
- ✓ Live Demo – A working prototype to showcase the solution in action
- ✓ Codebase (GitHub repo, Jupyter/Colab notebooks or other scripts)

1.4 Evaluation Criteria

- ✓ Functionality – How well does the system work? Does it extract and structure content correctly?
- ✓ Innovation – Is the approach creative or unique? Any novel features or methods?
- ✓ Data Handling / Model Performance – Quality of transcription, summarization, and content extraction
- ✓ Business Relevance – Does it solve the real problem effectively for students and educators?
- ✓ Bonus – Stretch features like personalized learning, multilingual support, or gamification

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