ADAPTIVE LEARNING TOOL FROM VIDEOS AND NOTES

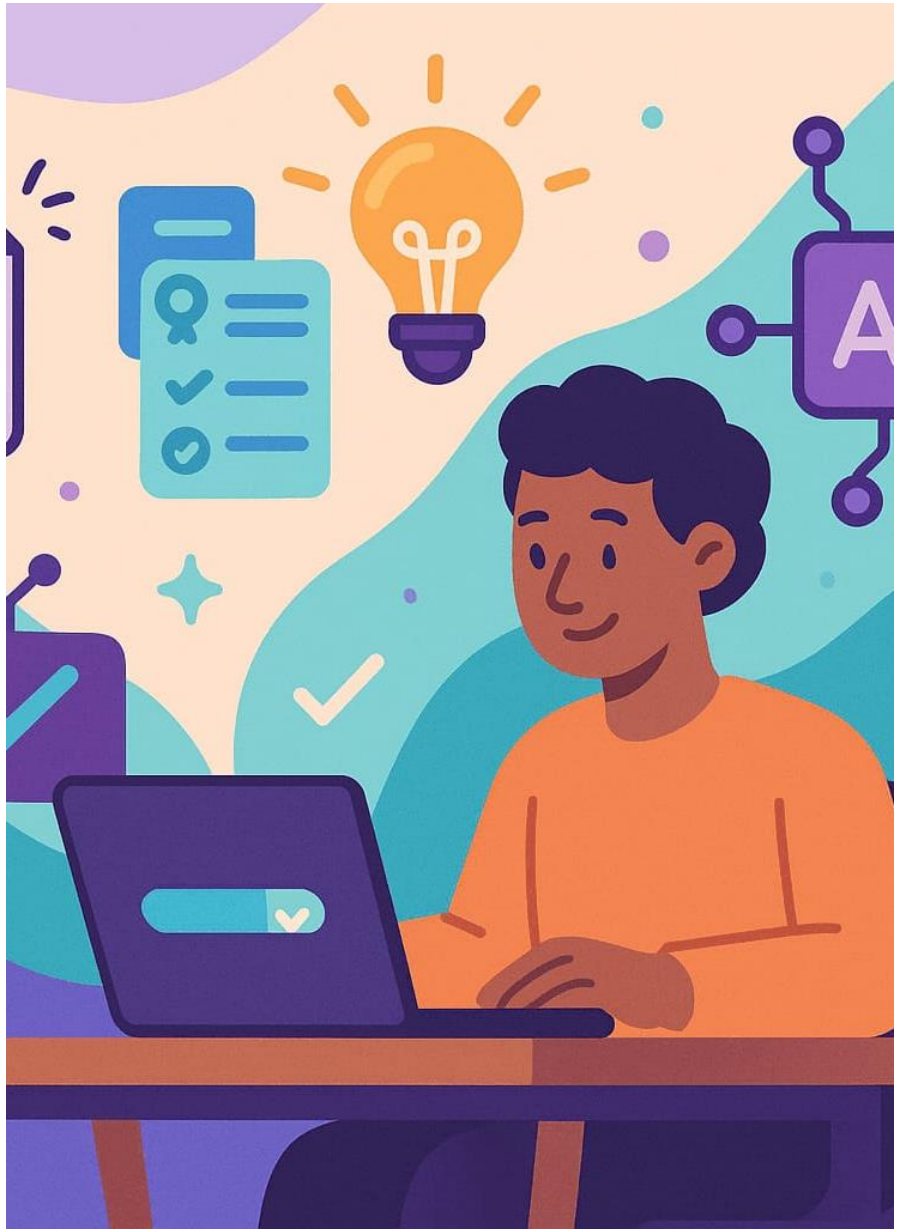
BY

MOHANAPRIYA R

GT - DS BATCH 11

WHAT IS **ADAPTIVE LEARNING?**

YoungWonks



ADAPTIVE LEARNING TOOL WITH AI-POWERED TRANSCRIPTION & SUMMARIZATION

This project, *Adaptive Learning Tool from Videos and Notes*, is designed to help students and learners study more effectively using Artificial Intelligence. Many times, students face challenges in understanding long lectures, taking proper notes, or revising quickly before exams. To solve this, our system allows users to upload lecture videos or audio files, which are then automatically converted into accurate transcripts. The tool also summarizes the lecture into key points, translates it into multiple languages for easy understanding, and even generates downloadable notes in PDF format. Additionally, quizzes are created from the content to help learners test their knowledge. This project makes learning faster, smarter, and more accessible for everyone.

INTRODUCTION AND PROBLEM STATEMENT

INTRODUCTION

Education today is rapidly shifting towards digital platforms, but students still face difficulties in managing lecture content effectively. Long videos and lengthy lectures make it hard to take proper notes, revise quickly, or understand complex topics. An **Adaptive Learning Tool** powered by AI can solve these challenges by automatically converting lecture videos into transcripts, summaries, and easy-to-read notes. This project focuses on creating such a tool that makes learning smarter, faster, and more accessible to all learners.

PROBLEM STATEMENT

Students often struggle with traditional learning methods due to:

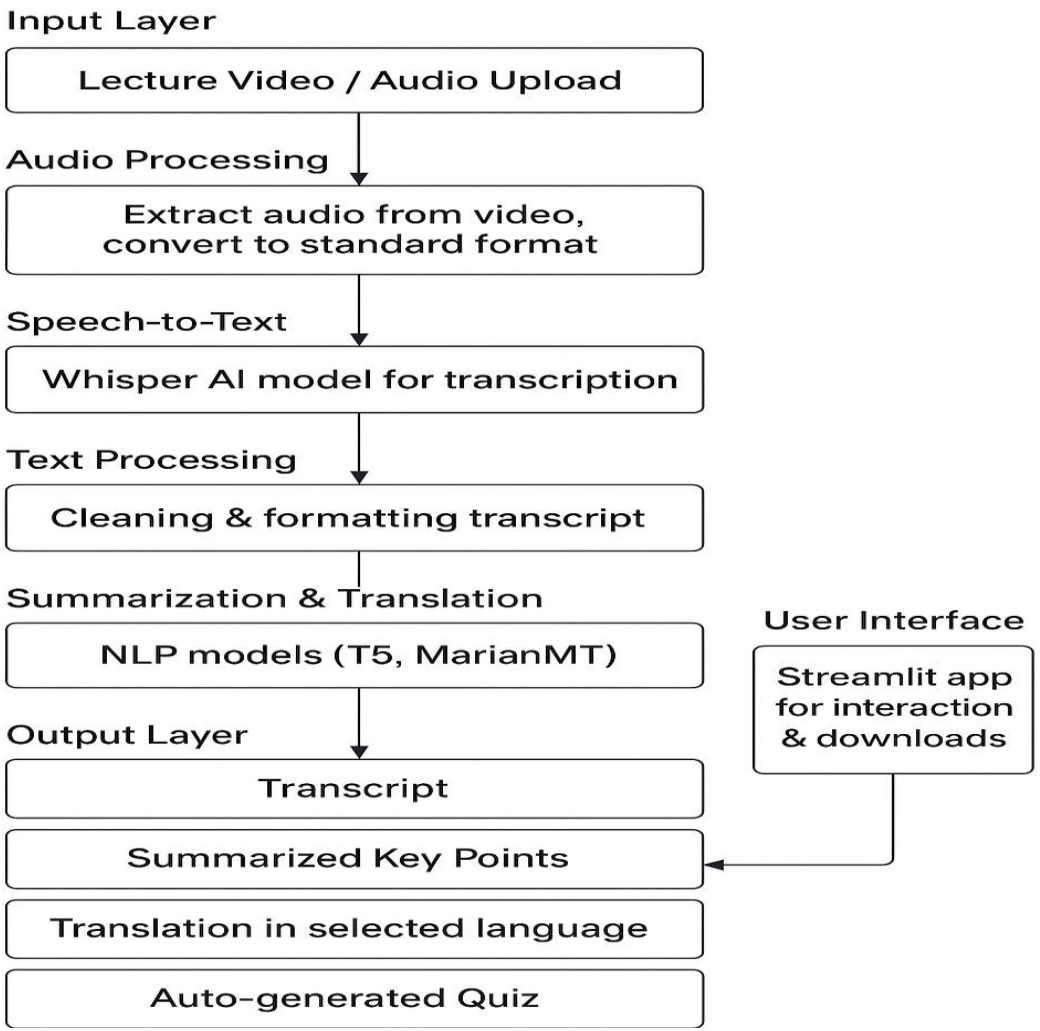
- Manual note-taking, which is time-consuming and error-prone.
- Difficulty in summarizing long lectures into short revision notes.
- Language barriers that prevent better understanding of content.
- Lack of quick self-assessment tools like quizzes.

Because of these issues, learners miss important points and spend extra time preparing for exams. Hence, there is a need for an **AI-based Adaptive Learning Tool** that can automatically generate transcripts, summaries, translations, and quizzes from lecture videos.

Proposed Solution

To overcome the challenges of traditional learning, this project introduces an **Adaptive Learning Tool** powered by AI. The system automatically processes lecture videos or audio, extracts the speech, and generates accurate **transcriptions**. These transcripts are further enhanced with **AI-powered summarization** to produce concise key points, making revision faster and easier. It also supports **multi-language translation**, breaking down language barriers for learners. Additionally, the tool provides **downloadable notes (PDF/PPT)** and **auto-generated quizzes**, enabling students to practice and test their knowledge effectively. This solution transforms passive lecture content into **interactive, personalized learning material** that adapts to each student's needs.

SYSTEM ARCHITECTURE



TECHNOLOGY STACK

- 🔹 **Frontend / User Interface**
- **Streamlit** – For building the interactive web application.
- **Python GUI Libraries** – For rendering content and visualizations.
- 🔹 **Backend / Processing**
- **Python** – Core programming language.
- **Whisper AI** – For speech-to-text transcription of lectures.
- **Transformers (Hugging Face)** – For text summarization & NLP tasks.
- 🔹 **Data Handling & Storage**
- **Pandas / NumPy** – For structured data handling.
- **SQLite / CSV** – Lightweight storage for transcripts & summaries.
- 🔹 **Visualization & Reporting**
- **Matplotlib / Seaborn** – For generating charts and visualizations.
- **ReportLab** – For exporting transcripts & summaries to PDF/Docx.

FEATURES

AI-Powered Transcription – Converts lecture videos and audios into accurate text.

Smart Summarization – Generates concise key points for quick revision.

Multi-Language Support – Translates transcripts and summaries into different languages.

Auto-Generated Quizzes – Creates practice questions from lecture content for self-assessment.

Downloadable Notes – Exports transcripts, summaries, and quizzes into PDF/PPT format.

User-Friendly Interface – Simple and interactive platform built using Streamlit.

Personalized Learning – Adapts content to each learner's pace and style.

BENEFITS

- ✅ **Time-Saving** – Students can revise hours of lecture content in just a few minutes through summaries.
- ✅ **Better Understanding** – Simplified notes and quizzes improve knowledge retention.
- ✅ **Accessibility** – Multi-language support makes learning easier for non-native speakers.
- ✅ **Easy Revision** – Downloadable transcripts and notes allow quick offline study.
- ✅ **Enhanced Engagement** – Interactive quizzes keep learners actively involved.
- ✅ **Bridging Gaps** – Helps students who miss classes or struggle with traditional note-taking.

COMPARISON: BEFORE VS AFTER

Aspect	Before (Traditional Learning)	After (With Adaptive Learning Tool)
Note-taking	Manual, time-consuming, error-prone	Automatic transcripts & clean downloadable notes
Revision	Reading full textbooks / re-watching long lectures	Quick summaries & bullet points for faster revision
Language Barrier	Students struggle if lecture is in unknown language	Multi-language translation for better accessibility
Engagement	Passive listening, low interaction	Interactive quizzes for active participation
Availability	Notes depend on students / teachers	Always available in PDF & PPT formats for offline use
Learning Style	One-size-fits-all, not personalized	Adaptive & AI-powered summaries tailored to learners

FUTURE SCOPE

- **AI-powered Quiz Generation** – Auto-generate questions from transcripts.
- **Voice-based Assistant** – Real-time Q&A support for learners.
- **LMS Integration** – Connect with Moodle, Google Classroom, etc.
- **Learning Analytics** – Track progress & give personalized suggestions.
- **Expanded Language Support** – Cover 50+ global languages.
- **Cloud & Mobile Deployment** – Access tool anytime, anywhere.

CONCLUSION

- Converts lecture videos and notes into interactive, personalized learning material.
- Automatically transcribes audio to text for easy reference.
- Summarizes content into key points for faster understanding.
- Translates material into multiple languages for wider accessibility.
- Generates quizzes to reinforce learning and assess understanding.
- Supports diverse learning styles with text, summaries, and interactive content.
- Saves time and enhances study efficiency.
- Designed for future enhancements like AI-driven performance tracking and content personalization.
- Makes learning more engaging, adaptive, and impactful.

OUTPUTS

- **Video Upload:** Select lecture video or notes to start.
- **Transcript:** Converts video/audio to readable text.
- **Summary:** Key points displayed as bullet points.
- **Translation:** Shows content in selected language.
- **Quiz:** Auto-generated questions for practice.
- **Download:** Save transcript, summary, or quiz as PDF.

🎓 Adaptive Learning Tool

Select your preferred language

English

Upload Lecture Video/Audio

Drag and drop file here

Limit 200MB per file • MP4, WAV, MP3, MPEG4

lecture.mp4 12.5MB

✅ File uploaded successfully!

🔊 Processing audio...

Processing audio...

Transcribing using Whisper...

Transcript

Today s formula is very important. Q1 is equal to K times Q2 by R square. We are using this formula for two charges. The force between the two charges can be attractive or repulsive. If you have given a question like this, you can find the distance between the two charges. This K is constant. K is equal to 1 by 4 pi epsilon naught. This value is 9 into 8 into the power of 9. Similarly, this value of epsilon naught is constant. So, 8.85 into 10 to the power of minus 12. So, we are saying that 1 by 4 pi epsilon naught is constant. If you have given a question like this, force is here. The unit we are writing is 8 to the power of minus 1. The meter square is above that. And here is the coulomb square. This is the simple term. So, depending upon the thing, if you have given two charges and given distance, you can find the force easily. If you have given a question like this, force is here and this R square is here. So, depending upon the question, if you understand how to change the formula, this term will be very easy for you.

Download Transcript

Summarizing key points...

Summary / Key Points

- Q1 is equal to K times Q2 by R square.
- Force between the two charges can be attractive or repulsive.
- If you have given a question like this, force is here and this R square is here.
- So, depending upon the question, if you understand how to change the formula, this term will be very easy ..

Download Notes as PDF

🎯 Quiz: Answer the questions below

Q1

What is the formula of Force?

- ○ F = a
- ◉ F = m · a
- ○ F = v + d
- ○ F = a + v

Q2

What is the formula of Coulomb's law?

- ◉ $F = k * (|q1*q2|) / r^2$
- ○ F = a * (q2 - q1)
- ○ F = a * d(q1,q2)
- ○ F = r * a(q1+q2)

Submit Quiz

Q1: ✅ Correct!

Q2: ✅ Correct!

🎯 Total Score: 2 / 2

THANK YOU