

PROJECT REPORT
AI STUDY ASSISTANT

(StudyMate AI)

SUBMITTED TO
SAVITRIBAI PHULE PUNE UNIVERSITY, PUNE.

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FOR THE AWARD OF DEGREE OF
BACHELOR OF COMPUTER SCIENCE

BY

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CHAPTER 1. INTRODUCTION

INTRODUCTION -

1.1 Introduction

The AI Study Assistant is a web-based application designed to assist students in improving their learning process using Artificial Intelligence. In today's digital era, students are required to study large amounts of information, which can be time-consuming and difficult to manage.

This system provides an efficient solution by allowing users to **upload PDF documents** and automatically generating useful study materials such as summaries, quizzes, flashcards, and mind maps. These features help students understand concepts quickly and revise effectively.

The application is developed using modern web technologies such as **Html, Css, JavaScript, Python frameworks Like Flask** demonstrates how AI can be used to automate learning tasks and improve productivity

1.1 Abstract

The AI Study Assistant is a web-based application developed to make studying easier and more efficient for students. Nowadays, students spend a lot of time reading large amounts of content and making notes manually, which can be tiring and time-consuming.

This system helps by allowing users to upload PDF files and automatically generating useful outputs such as summaries, quizzes, flashcards. These features help students understand topics quickly and revise effectively.

The system is developed using modern web technologies and demonstrates how Artificial Intelligence can be used to improve the learning process in a simple and user-friendly way.

CHAPTER 2 : NEED OF COMPUTERIZATION:

NEED OF COMPUTERIZATION

2.1 Introduction

In the modern world, computerization has become an essential part of every field, especially in education. Traditional methods of studying involve reading textbooks, making handwritten notes, and manually preparing for exams. These methods are time-consuming and often inefficient.

The AI Study Assistant system is designed to overcome these limitations by providing a computerized solution that automates the study process and improves efficiency.

2.2 Need of Computerization in the System

The need for computerization in the AI Study Assistant arises due to the following reasons:

- **Time Consumption:**

Manual study methods require a lot of time for reading and preparing notes.

Computerization helps in generating summaries instantly.

- **Lack of Automation:**

Traditional systems do not provide automated tools for quiz generation or flashcards.

A computerized system can perform these tasks efficiently.

- **Difficulty in Revision:**

Students often find it difficult to revise large amounts of content. Computerized tools like summaries and flashcards make revision easier..

- **Human Error:**

Manual note-making can lead to errors or missing important points. Computerized systems ensure accuracy and consistency.

2.3 Advantages of Computerization

The AI Study Assistant provides the following advantages:

- Faster processing of data
- Improved accuracy
- Easy access to study material
- Better organization of information
- Interactive learning experience

2.4 Conclusion

Thus, computerization is necessary to improve the efficiency and effectiveness of the learning process. The AI Study Assistant provides a modern solution that replaces traditional methods with automated and intelligent features.

CHAPTER 3: FACT FINDING TECHNIQUES

FACT FINDING TECHNIQUES

3.1 Introduction

Fact finding techniques are used to collect information about the existing system and understand user requirements before designing a new system. These techniques help in identifying problems and defining the scope of the proposed system.

3.2 Techniques Used

The following fact finding techniques were used during the development of the AI Study Assistant system:

1. Observation

Observation involves studying the behavior and activities of users.

- Students were observed while studying and preparing notes.
 - It helped in identifying difficulties faced during revision.
 - It provided insights into the need for automation.
-

2. Internet Research

Internet research was conducted to gather information about existing AI-based learning systems.

- Various educational platforms were studied.
 - AI tools for summarization and quiz generation were analyzed.
 - This helped in understanding current technologies and trends.
-

3. Discussion

Discussions were carried out with students and peers.

- Feedback was collected regarding study problems.
 - Suggestions were taken for improving learning methods.
 - This helped in identifying user expectations.
-

4. Literature Study

Different research papers and online documentation were studied.

- Information about AI in education was collected.
 - Concepts of automated learning systems were understood.
 - It helped in designing the system effectively.
-

3.3 Conclusion

Fact finding techniques played an important role in understanding the limitations of the existing system and identifying user requirements. These techniques helped in designing an effective AI Study Assistant system that meets the needs of students.

CHAPTER 4 : Study of Existing System

Study of Existing System

Existing System:

In the current system, students mainly depend on textbooks, handwritten notes, and online videos for studying. They have to read everything manually and create their own notes for revision.

Drawbacks:

- It takes a lot of time to read and understand large content
- Making notes manually is difficult
- No automatic way to generate quizzes or revision material
- Learning is not personalized

Features:

Automatic Notes Generation:

The system can convert large study material (PDFs, text, videos) into short and easy-to-understand notes automatically.

Quiz Generation:

It generates quizzes from the study content to help students test their understanding and improve revision.

Time-Saving Learning:

Reduces the time required to read and understand long content by providing summarized information.

Personalized Learning:

The system adapts content based on the student's learning speed and preferences.

User-Friendly Interface:

Simple and easy-to-use interface so that even beginners can use it without technical knowledge.

Multi-Source Input:

Supports different input types like text, PDFs, and online content.

Revision Support:

Provides quick revision notes and key points before exams.

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CHAPTER 5 : Study of Proposed System

📄 Study of Proposed System:

5.1 Need for System

There is a need for a system that can:

- Save time
 - Provide quick summaries
 - Help in self-assessment through quizzes
 - Make learning more interactive
-

5.2 Feasibility Study

A Feasibility Study is conducted to evaluate the practicality and effectiveness of the proposed AI Study Assistant system. It helps in understanding whether the system can be successfully implemented using available resources and technologies.

5.3 Drawbacks of Proposed System

Drawbacks of Proposed System

Although the AI Study Assistant system provides many useful features, it also has certain limitations due to its current implementation and prototype nature.

• Dependence on Internet:

The system requires an active internet connection for AI-based processing, which may limit accessibility in offline environments.

• Accuracy Limitations:

The accuracy of generated outputs such as summaries, quizzes, and flashcards depends on the quality of input data and AI processing. In some cases, outputs may not be fully accurate.

• Lack of Advanced AI Models:

The system uses basic or simulated AI logic and does not include advanced machine learning or deep learning models for highly accurate results.

- **No Full Backend Integration:**

The system does not include a fully developed backend database for storing user data and history permanently.

- **Limited Scalability:**

The current system is designed as a prototype and may not handle a large number of users efficiently.

- **Security Limitations:**

Advanced security features such as encryption, authentication, and data protection are limited in the current system.

- **Limited Customization:**

The system provides general outputs and does not fully adapt to individual learning styles or preferences.

5.4 Features of Proposed System

Features of Proposed System

The AI Study Assistant system provides various features that help students improve their learning process. These features are designed to automate study tasks and provide better understanding of the content.

- **PDF Upload Functionality:**

The system allows users to upload study material in PDF format for processing.

- **Summary Generation:**

The system generates concise summaries from the uploaded documents, helping students understand key points quickly.

- **Quiz Generation:**

The system automatically creates questions based on the content, which helps users in self-assessment.

- **Flashcards Generation:**

Important concepts are converted into flashcards for quick and effective revision..

- **User-Friendly Interface:**

The system is designed with a simple and interactive interface, making it easy to use.

- **Fast Processing:**

The system processes data quickly and provides results in a short time.

• **Multi-Feature Integration:**

All features such as summary, quiz, flashcards, and mind maps are integrated into a single platform.

5.5 Objectives of Proposed System

Objectives of Proposed System

The main objective of the AI Study Assistant system is to improve the efficiency of studying by using Artificial Intelligence. The specific objectives are as follows:

- To develop a system that automates the process of studying.
 - To generate summaries from large documents to save time and effort.
 - To provide quiz generation for self-evaluation and practice.
 - To create flashcards for quick revision of important concepts.
 - To reduce manual effort in note-making and studying.
 - To provide a user-friendly and interactive interface for students.
 - To demonstrate the practical application of Artificial Intelligence in education.
-

5.6 System Specifications

System specifications define the hardware and software requirements needed to run the AI Study Assistant system effectively.

1. Software Requirements

Client-Side

Component	Requirement
Operating System	Windows / Linux / macOS
Browser	Chrome, Edge, Firefox
Frontend Technologies	Html ,CSS ,Js
Tools	VS Code

Server-Side (Optional / Future Scope)

Component	Requirement
Operating System	Windows.
Backend	Python
Database	SqlLite
API Integration	OpenAI API

2. Hardware Requirements

Client-Side (User Device)

Component Requirement

Processor	Dual-Core or higher
RAM	Minimum 4 GB
Storage	100 MB free space
Device	Laptop / Desktop
Internet	Required

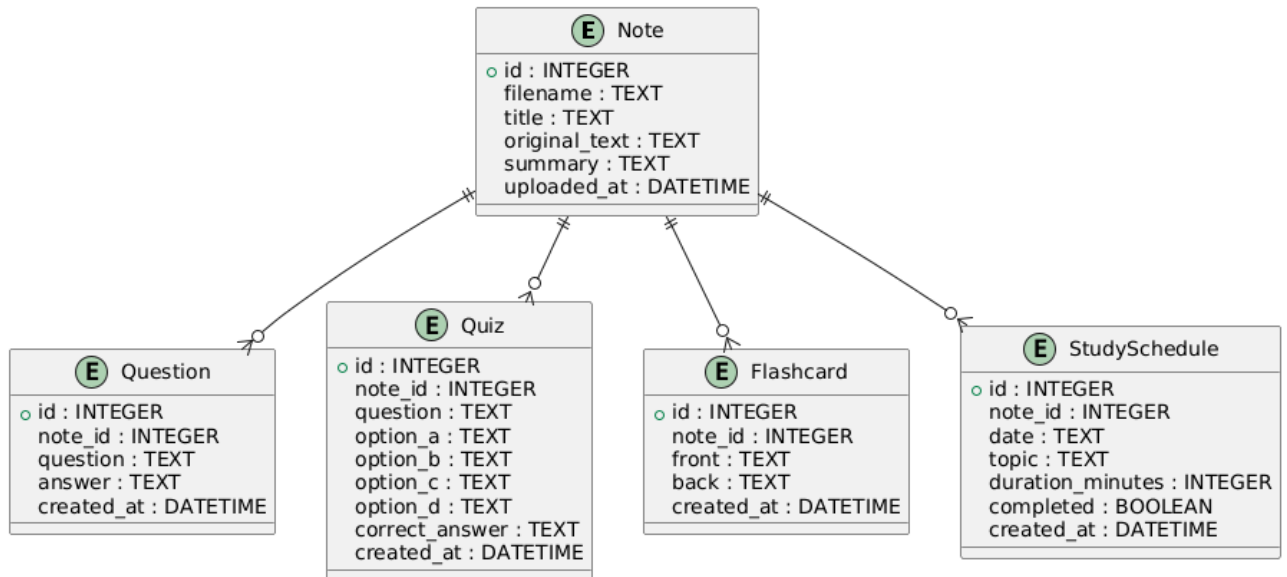
Server-Side (Optional)

Component Requirement

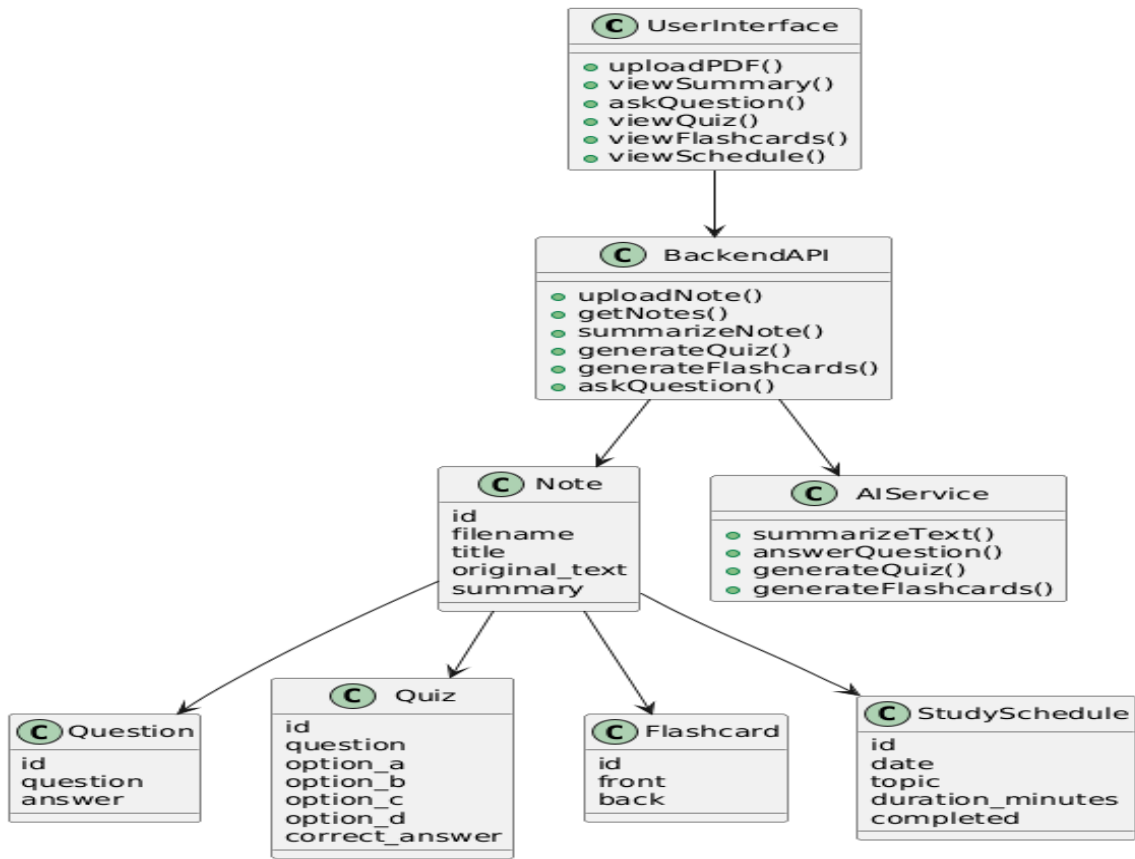
Processor	Quad-Core
RAM	8 GB recommended
Storage	10 GB free space
Network	Stable internet connection

CHAPTER 6 : User Requirements:

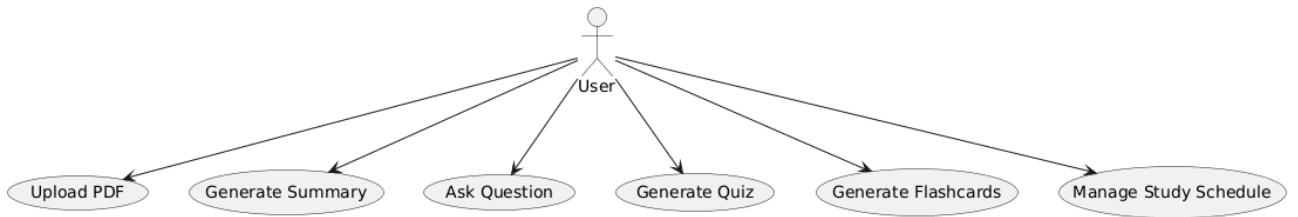
6.1 Entity Relationship Diagram



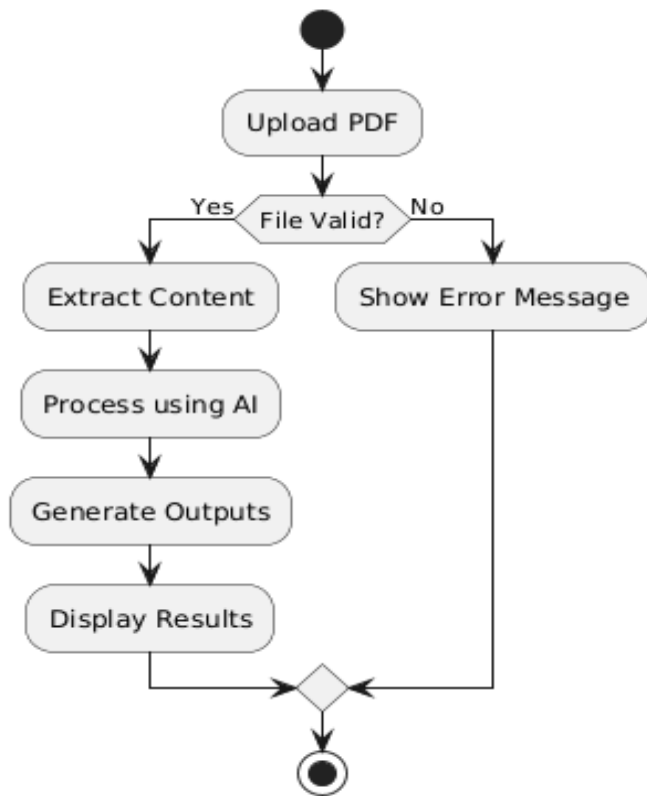
6.2 Class Diagram:



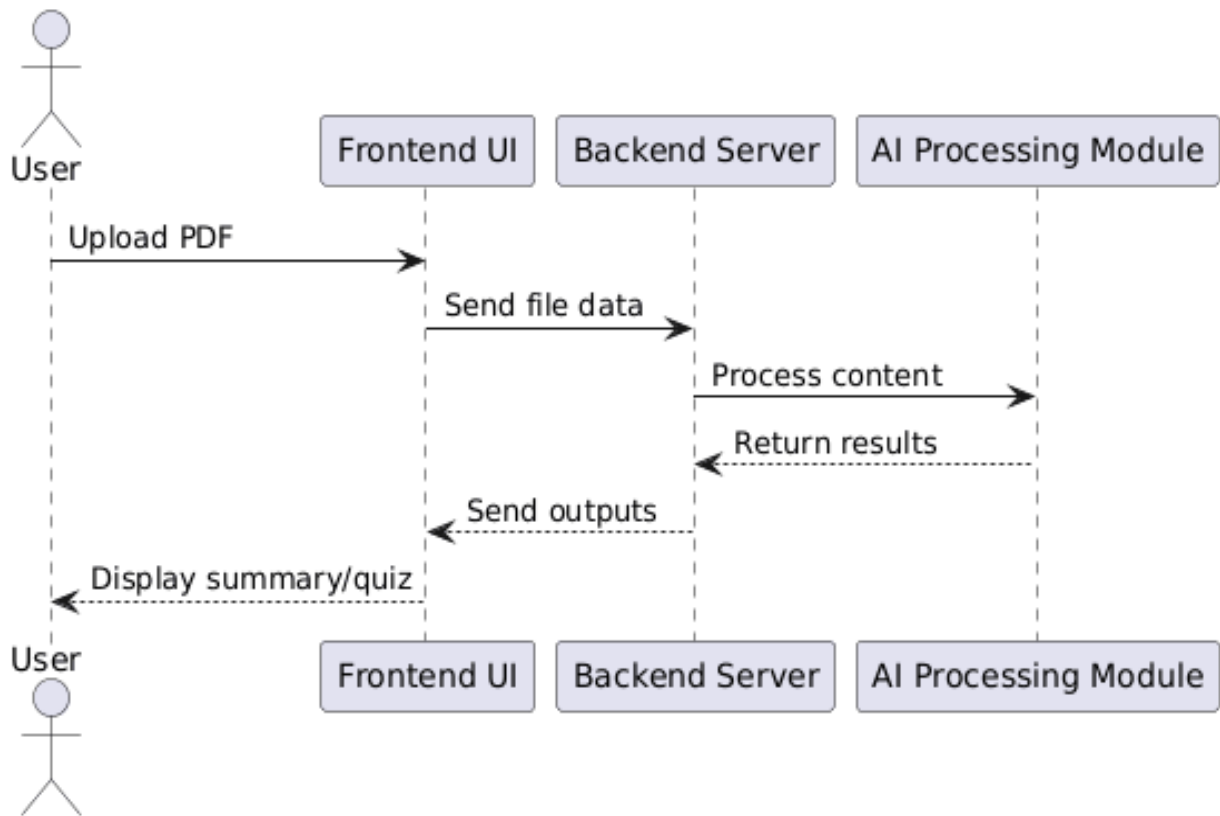
6.3 Use Case Diagram



6.4 Activity Diagram



6.5 Sequence Diagram



CHAPTER 7 : DATABASE DESIGN

1. Notes Table

This table stores the uploaded PDF documents and their processed content.

Column Name	Data Type	Constraint	Description
id	INTEGER	Primary Key, Auto Increment	Unique ID of note
filename	TEXT	Not Null	Name of uploaded file
title	TEXT	Not Null	Title of document
original_text	TEXT	-	Extracted content
summary	TEXT	-	Generated summary
uploaded_at	DATETIME	Default	Upload timestamp
file_path	TEXT	-	File storage path

2. Questions Table

This table stores question-answer pairs generated from notes.

Column Name	Data Type	Constraint	Description
id	INTEGER	Primary Key	Unique ID
note_id	INTEGER	Foreign Key	Links to notes
question	TEXT	Not Null	Generated question
answer	TEXT	Not Null	Answer
created_at	DATETIME	Default	Creation time

3. Quizzes Table

Stores multiple-choice questions.

Column Name	Data Type	Constraint	Description
id	INTEGER	Primary Key	Unique ID
note_id	INTEGER	Foreign Key	Reference to note
question	TEXT	Not Null	Question
option_a	TEXT	Not Null	Option A
option_b	TEXT	Not Null	Option B
option_c	TEXT	Not Null	Option C
option_d	TEXT	Not Null	Option D
correct_answer	TEXT	Not Null	Correct option
created_at	DATETIME	Default	Timestamp

4. Flashcards Table

Stores flashcards for revision.

Column Name	Data Type	Constraint	Description
id	INTEGER	Primary Key	Unique ID
note_id	INTEGER	Foreign Key	Linked note
front	TEXT	Not Null	Question
back	TEXT	Not Null	Answer
created_at	DATETIME	Default	Timestamp

5. Study Schedule Table

Stores user study plans.

Column Name	Data Type	Constraint	Description
id	INTEGER	Primary Key	Unique ID
note_id	INTEGER	Foreign Key	Linked note
date	TEXT	Not Null	Study date
topic	TEXT	Not Null	Topic
duration_minutes	INTEGER	-	Study duration
completed	BOOLEAN	Default 0	Status
created_at	DATETIME	Default	Timestamp

Relational Schema

The database follows a relational model where tables are connected using foreign keys.

Test Case Design:

Test cases are designed to verify the functionality and correctness of the AI Study Assistant system. Each module is tested using different inputs to ensure proper working, accuracy, and error handling.

□ Test Case Table

1. PDF Upload Module

Test Case ID	Description	Input	Expected Output	Result
TC01	Upload valid PDF	Valid PDF file	File uploaded successfully	Pass
TC02	Upload invalid file	Image/Text file	Error message displayed	Pass
TC03	Upload empty file	Empty PDF	Warning message shown	Pass

2. Summary Generation Module

Test Case ID	Description	Input	Expected Output	Result
TC04	Generate summary	Valid document	Summary displayed	Pass
TC05	Summary quality	Large content	Key points included	Pass
TC06	No content	Empty input	Error message	Pass

3. Quiz Generation Module

Test Case ID	Description	Input	Expected Output	Result
TC07	Generate quiz	Valid content	Questions generated	Pass

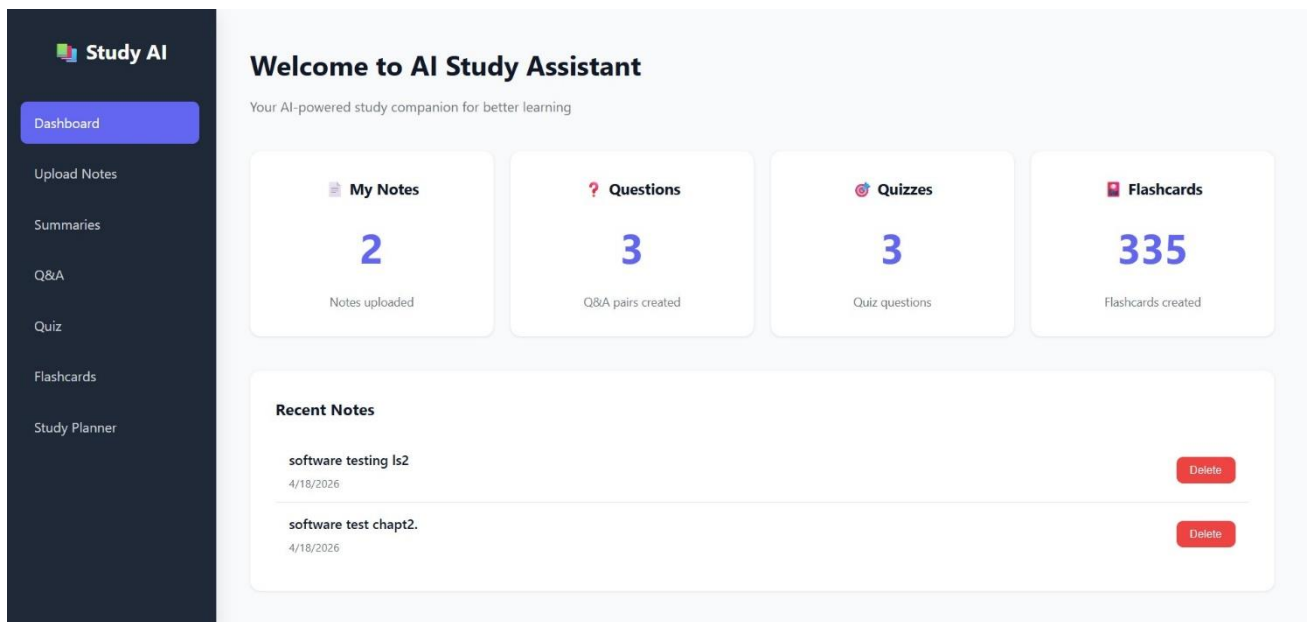
TC08	Relevance check	Content-based	Relevant questions	Pass
TC09	Empty input	No data	Error message	Pass

5. System Behavior & UI

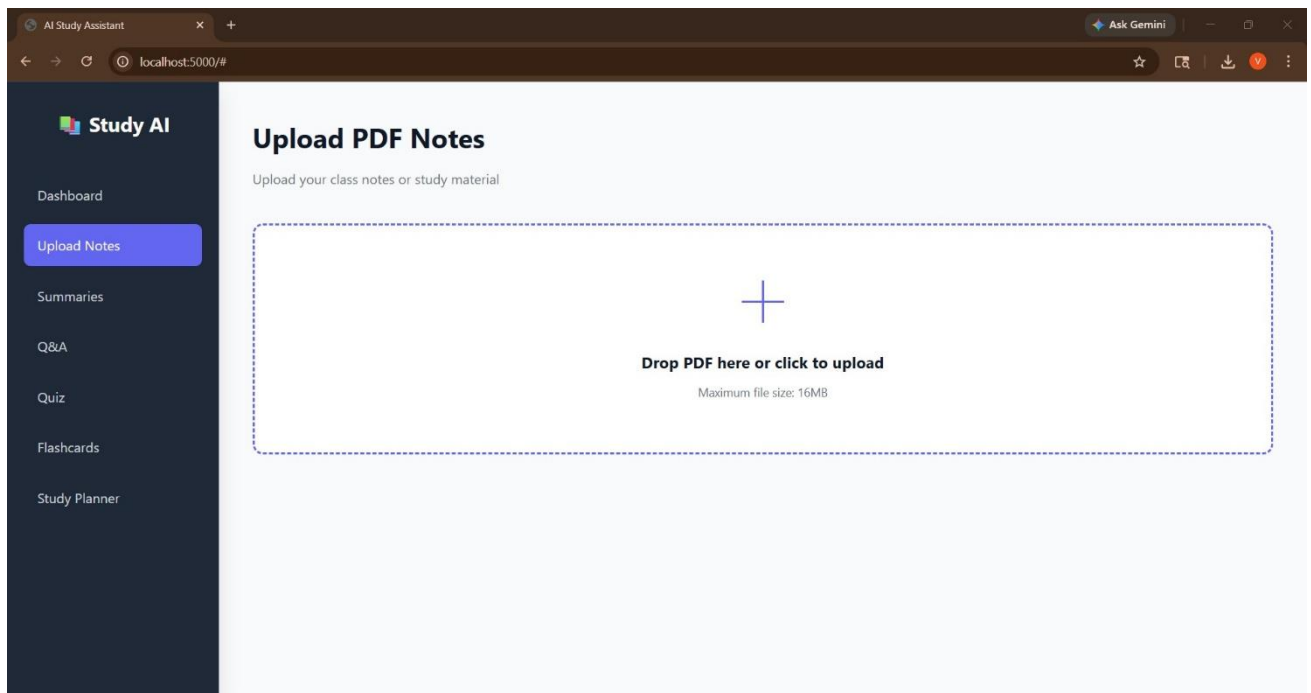
Test Case ID	Description	Input	Expected Output	Result
TC13	No file uploaded	Click generate	Warning message shown	Pass
TC14	Generate flashcards	Valid content	Flashcards displayed	Pass
TC15	Navigation	Switch pages	Pages load correctly	Pass
TC16	Content display	Prepared data	Close Q&A pairs	Pass
TC17	Output display	Generated data	Proper display	Pass
TC12	Empty content	No data	Error message	Pass

CHAPTER 9 : Sample I/O screen

DashBoard:



Upload pdf page:



Ask Question page

Study AI

- Dashboard
- Upload Notes
- Summaries
- Q&A
- Quiz
- Flashcards
- Study Planner

Ask Questions

Get AI answers about your notes

Select a note:

-- Choose a note --

Your question:

Ask anything about your notes...

[Ask Question](#)

Q&A History

Q: give me question that are frequently asked

A: 1. What is a test strategy in software development? 2. Why is a test strategy important? 3. What are the key components of a testing strategy? 4. How does a testing strategy mitigate product risks? 5. What types of testing are included in a testing strategy? 6. What are entry and exit criteria in testing? 7. How do you plan and execute a testing strategy? 8. What techniques and tools are used in a testing strategy? 9. How does a testing strategy impact project timelines and resources? 10. What are the characteristics of effective software testing strategies?

[Delete](#)

Q: give me question answer 8 marks uppu

A: "Question" What is the role of a test strategy in software development, and what key characteristics do all software testing strategies share? "Answer" A test strategy plays a crucial role in software development by outlining the testing approach within the software development cycle. It serves as a clear blueprint that integrates test case design techniques into a structured series of steps, ultimately guiding the successful construction of the software. The strategy details how to mitigate product risks for stakeholders at the test level, specifies the types of testing to be conducted, and outlines entry and exit criteria. Additionally, it provides a roadmap for planning, executing, and evaluating testing efforts, including the resources and time required. All software testing strategies share the following characteristics: 1. Testing begins at the component level. 2. They define test cases and specifications, organizing them for execution. 3. The strategy clarifies major tasks and approaches specific to the project's objectives. 4. They provide templates for testing, ensuring clarity and specificity.

[Delete](#)

Q: give me 2 marks question according to uppu

A: What is the purpose of a test strategy in software development?

[Delete](#)

FlashCards Page:

Study AI

- Dashboard
- Upload Notes
- Summaries
- Q&A
- Quiz
- Flashcards
- Study Planner

Flashcards

Learn with interactive flashcards

Select a note:

-- Choose a note --

-- Choose a note --

software testing ls2

software test chapt2.

What is a test strategy in software development?

← Previous
Next →

Study Planner page:

The screenshot shows the 'Study Planner' page of the 'Study AI' application. On the left is a dark sidebar with navigation links: Dashboard, Upload Notes, Summaries, Q&A, Quiz, Flashcards, and Study Planner (highlighted in blue). The main content area has a header 'Study Planner' with the subtitle 'Plan and track your study schedule'. Below this are two panels. The 'Add Study Session' panel contains three input fields: 'Date' (04/18/2026), 'Topic' (e.g., Chapter 3 Review), and 'Duration (minutes)' (30), with an 'Add to Schedule' button. The 'Study Schedule' panel displays two items: 'chapter 1 os revision' (2026-04-15 • 30 minutes) and 'chapter 1 OS 2' (2026-03-22 • 30 minutes), each with 'Done' and 'Delete' buttons.

Study AI

- Dashboard
- Upload Notes
- Summaries
- Q&A
- Quiz
- Flashcards
- Study Planner**

Study Planner

Plan and track your study schedule

Add Study Session

Date: 04/18/2026

Topic: e.g., Chapter 3 Review

Duration (minutes): 30

[Add to Schedule](#)

Study Schedule

- chapter 1 os revision
2026-04-15 • 30 minutes
[Done](#) [Delete](#)
- chapter 1 OS 2
2026-03-22 • 30 minutes
[Done](#) [Delete](#)

CHAPTER 9. LIMITATIONS OF PROPOSED SYSTEM

CHAPTER 9: LIMITATIONS OF PROPOSED SYSTEM

The AI Study Assistant system provides useful functionalities; however, it has certain limitations due to its prototype nature and current implementation.

- The system depends on internet connectivity for processing AI-based features.
- The accuracy of generated outputs such as summaries and quizzes depends on the quality of input content.
- The system does not include a fully integrated backend database for long-term data storage.
- It does not support real-time collaboration between multiple users.
- Advanced AI techniques such as deep learning and model training are not implemented.
- Security features are basic and do not include advanced authentication mechanisms.

CHAPTER 10: PROPOSED ENHANCEMENTS

The system can be further improved by adding advanced features and functionalities in future versions.

Technical Enhancements

- Implementation of secure authentication and user management system.
 - Use of advanced AI models for more accurate output generation.
-

Functional Enhancements

Mind map generation using prompts

- User Authentication for better security
 - Development of mobile application for better accessibility.
 - Addition of voice-based interaction for hands-free usage.
 - Personalized learning recommendations based on user behavior.
-

CHAPTER 11: CONCLUSION

The AI Study Assistant system successfully demonstrates the application of Artificial Intelligence in the field of education. The system helps students by automating the process of studying and providing structured outputs such as summaries, quizzes, flashcards, and mind maps.

The project reduces manual effort and improves learning efficiency. It also provides a user-friendly interface that makes studying more interactive and engaging.

Overall, the system serves as a strong foundation for future AI-based educational tools and can be enhanced further by integrating advanced technologies.

CHAPTER 12: BIBLIOGRAPHY

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