

Smart PDF Summarizer

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Project Overview

This is a web application that lets users upload PDF files and get AI-powered help. It summarizes the content, extracts data, answers questions, translates the text, and generates quiz questions. Charts and tables are used to make the content more understandable.

Key Features Implemented

- Upload PDF files
- Extract text using PyMuPDF (fallback to OCR with pytesseract if needed)
- Detect the language of the text
- Translate content using Google Translate (googletrans)
- Summarization options:
 - Full summary (entire PDF)
 - Page-by-page summary
 - Grouped summary (every 3 pages)
- Extract numbers and values from text
- Create bar/line/pie charts from extracted data (using Chart.js)
- Search and summarize by keyword
- Identify most frequent meaningful word and summarize based on that
- Ask questions about the summarized PDF and get AI answers
- Download summary as PDF or Word document
- Toggle dark mode for better viewing
- Generate quiz questions based on PDF content using Gemini API

Backend Tools Used

- Flask: Web framework to handle routing and logic
- PyMuPDF (fitz): Extract text from PDF pages
- pdf2image + pytesseract: Convert scanned pages to images and extract text with OCR
- langdetect: Automatically find the document's language
- fpdf / python-docx: Export summaries as downloadable files
- joblib: Used for saving/loading ML-related components (future use)

Frontend Tools Used

- HTML & CSS: Create and style the UI (clean layout, glass effect, animations)
- JavaScript: Add interactivity (tabs, search, chart rendering)
- Chart.js: Draw dynamic charts based on extracted values
- Typing and fade animations: Improve user experience
- Dark mode toggle: Allow user to switch themes

AI & APIs Used

- Google Generative AI (Gemini):
 - Used for all summarization modes
 - Generates answers to user questions based on content
 - Creates labeled data from numbers (used in charts)
 - Generates quiz questions
- Google Translate (googletrans):
 - Translates the content from one language to another before summarizing

Progress (Tries, failure, successes)

