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AI agent assignment→

Documentation for PDF Insights AI

Overview

PDF Insights AI is an AI-driven web application designed to extract text from uploaded PDFs and provide insightful answers to user questions based on the extracted content. This application leverages **NVIDIA Mistral** for generating contextual answers and is built using **FastAPI** for the backend and **Tailwind CSS** for the frontend styling.

Features

1. PDF Upload and Text Extraction:

- Users can upload a PDF file, and the application extracts text from the document using `pdfplumber`.
- Extracted text is stored temporarily and used as context for answering questions.

2. Question and Answer System:

- Users can ask questions related to the uploaded PDF.
- The application sends the question and extracted text as context to the NVIDIA Mistral API, which generates a relevant answer.

3. Multi-Question Support:

- Users can ask multiple questions sequentially without re-uploading the PDF.
- The context is preserved until a new PDF is uploaded.

4. Answer Display and Download:

- Answers are displayed dynamically on the webpage.
- Users can download the answers as a PDF file for offline reference.

5. Question History:

- A history section is provided to view previously asked questions and their corresponding answers.
- Users can clear the history at any time.

6. Responsive UI with Tailwind CSS:

- The user interface is styled with Tailwind CSS, ensuring a clean, modern, and responsive design.
- Features include gradient buttons, rounded cards, loading animations, and hover effects.

Technologies Used

1. FastAPI:

- A modern, fast web framework for building APIs with Python 3.7+.
- Utilized for creating backend routes, handling file uploads, and serving HTML templates.

2. pdfplumber:

- Used for extracting text from uploaded PDF documents.

3. NVIDIA Mistral API:

- NVIDIA's advanced language model used to generate contextual answers based on the extracted PDF content.

4. Jinja2 Templates:

- Used for rendering dynamic HTML content in FastAPI.

5. Tailwind CSS:

- A utility-first CSS framework for rapid UI development.
- Provides a responsive and visually appealing user interface.

6. JavaScript (Fetch API):

- Handles form submissions and dynamically updates the UI without page reloads.

Workflow and Implementation

1. File Upload and Text Extraction:

- Users upload a PDF file through the form on the main page.
- The file is temporarily saved, and text is extracted using `pdfplumber`.
- Extracted text is stored globally for answering multiple questions.

2. Question Submission and Answer Generation:

- Users submit a question related to the uploaded PDF.
- The question and extracted text are sent to the NVIDIA Mistral API.
- The API generates a contextual answer based on the provided content.
- The answer is displayed on the webpage.

3. History and Navigation:

- Each question and answer pair is saved in a history list.
- The user can view the complete history of questions and answers.
- A "Clear History" button is provided to reset the history.

4. Download Insights as PDF:

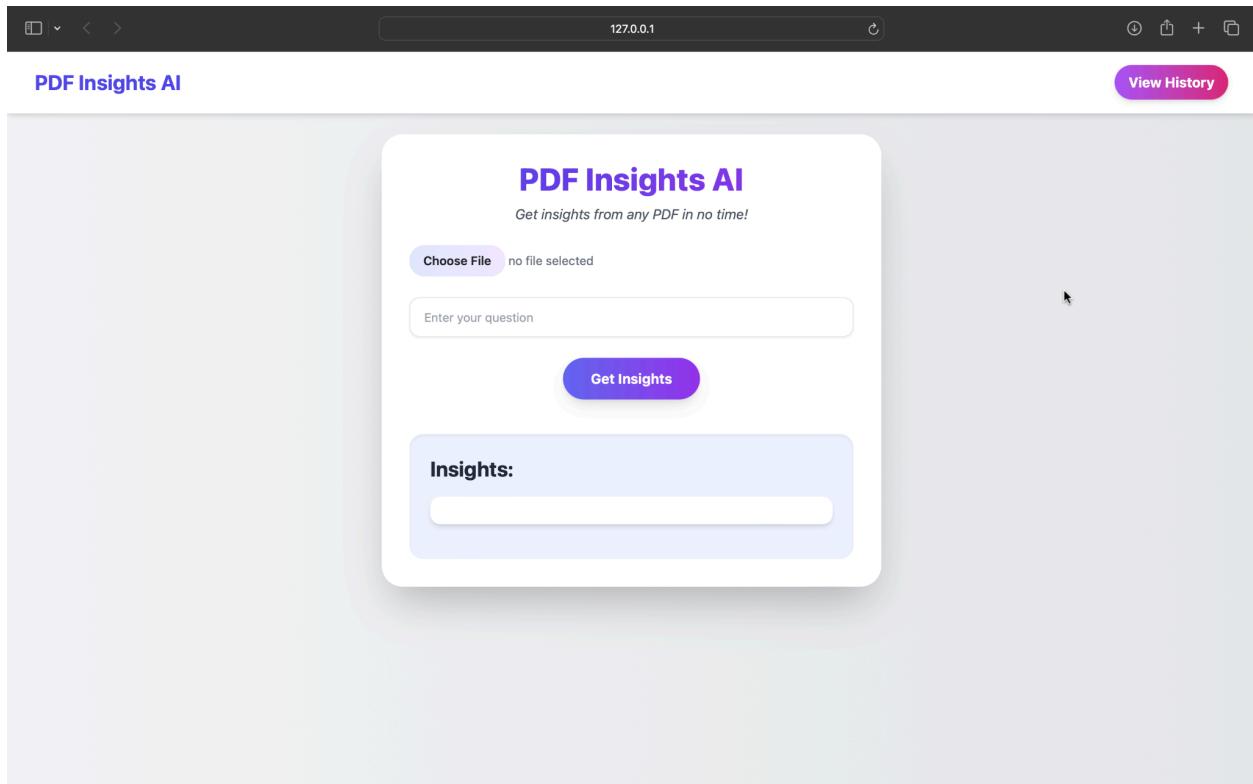
- Users can download the generated answer as a PDF file.
 - This is achieved by creating a Blob object in JavaScript and triggering the download.
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Results and Performance

- The application effectively extracts text from PDFs and provides relevant answers using the NVIDIA Mistral API.
- The multi-question support enhances user experience by allowing sequential queries without re-uploading the PDF.
- The interface is responsive and user-friendly, with smooth animations and transitions.
- Performance is consistent, with quick response times for both text extraction and answer generation.
- The download feature is reliable, allowing users to save insights for future reference.

Results:

This is home page of the website:

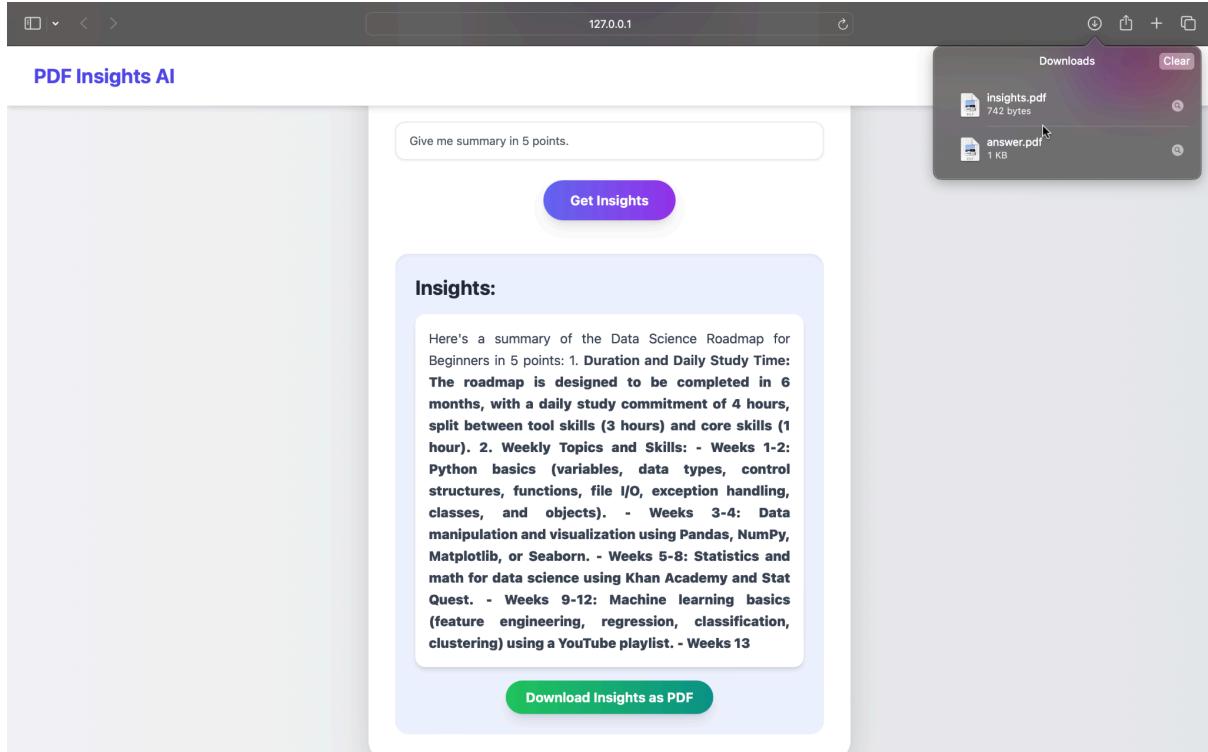


Then we upload the PDF and ask questions regarding it and the AI will take the extracted text from PDFplumber and give insights according to the PDF:

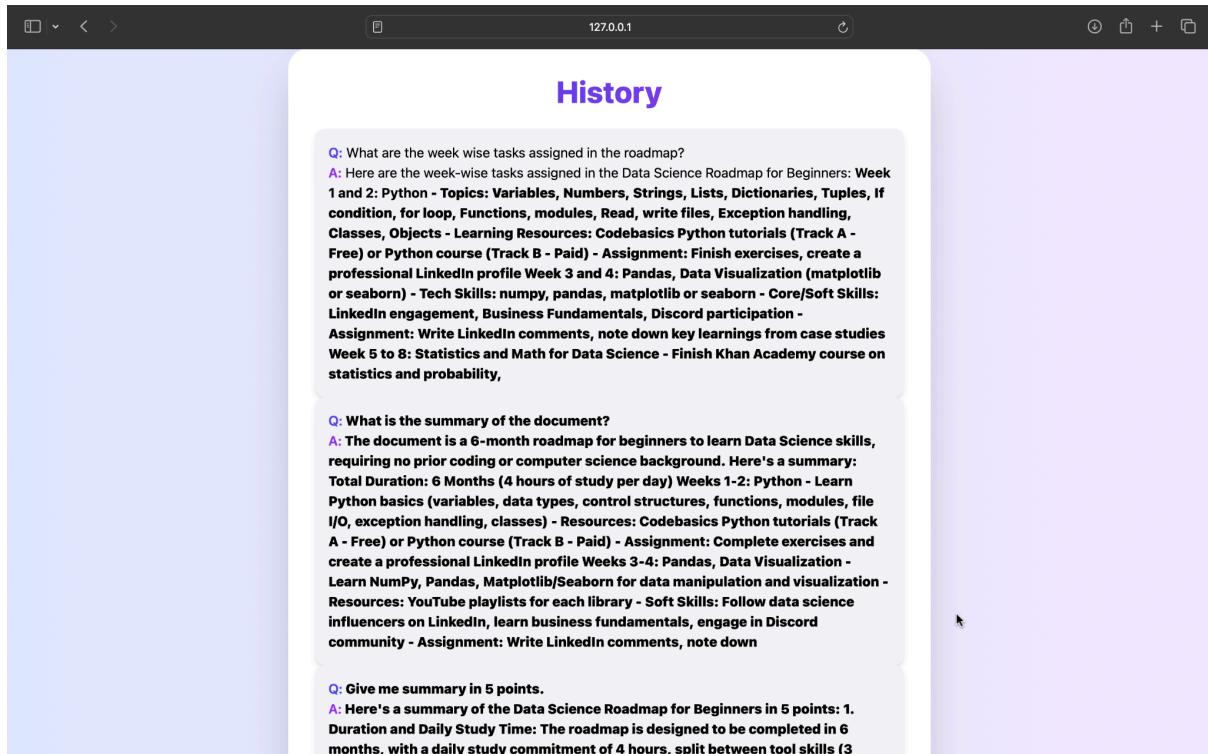
The screenshot shows the PDF Insights AI application running locally at 127.0.0.1. At the top, there's a navigation bar with icons for back, forward, and refresh, followed by the IP address '127.0.0.1'. On the right side of the header is a 'View History' button. The main content area has a title 'PDF Insights AI' and a subtitle 'Get insights from any PDF in no time!'. Below this is a 'Choose File' button with a document icon and the path 'ds_roadmap.pdf'. A text input field contains the question 'What are the week wise tasks assigned in the roadmap?'. A large purple 'Get Insights' button is positioned below the input field. A modal window titled 'Insights:' displays the generated response: 'Here are the week-wise tasks assigned in the Data Science Roadmap for Beginners: Week 1 and 2: Python - Topics: Variables, Numbers, Strings, Lists, Dictionaries, Tuples, If condition, for loop, Functions, modules, Read, write files, Exception handling, Classes, Objects - Learning Resources: Codebasics Python tutorials (Track A - Free) or Python course (Track B - Paid) - Assignment: Finish exercises, create a professional LinkedIn profile Week 3 and 4: Pandas, Data Visualization (matplotlib or seaborn) - Tech Skills: numpy, pandas, matplotlib or seaborn - Core/Soft Skills: LinkedIn engagement, Business'.

This screenshot shows the same PDF Insights AI application at 127.0.0.1. The interface is identical to the first one, with the 'View History' button on the right. In the main area, there is a text input field containing 'Give me summary in 5 points.' Below it is a purple 'Get Insights' button. A modal window titled 'Insights:' contains the summary: 'Here's a summary of the Data Science Roadmap for Beginners in 5 points: 1. Duration and Daily Study Time: The roadmap is designed to be completed in 6 months, with a daily study commitment of 4 hours, split between tool skills (3 hours) and core skills (1 hour). 2. Weekly Topics and Skills: - Weeks 1-2: Python basics (variables, data types, control structures, functions, file I/O, exception handling, classes, and objects). - Weeks 3-4: Data manipulation and visualization using Pandas, NumPy, Matplotlib, or Seaborn. - Weeks 5-8: Statistics and math for data science using Khan Academy and Stat Quest. - Weeks 9-12: Machine learning basics (feature engineering, regression, classification, clustering) using a YouTube playlist. - Weeks 13'.

I have also provided a download button so that users can download the generated answers for later use:



All the generated answers can be seen in the history page of the website:



From here Users can go back to asking questions and also clear the history if they want to:

The screenshot shows a web browser window with the URL 127.0.0.1. The main content area displays a conversation between a user and an AI system. The user asks about the summary of a document, and the AI provides a detailed response. Below the AI's response, there are two buttons: "Go Back" and "Clear History".

or seaborn) - Tech Skills: numpy, pandas, matplotlib or seaborn - Core/Soft Skills: LinkedIn engagement, Business Fundamentals, Discord participation - Assignment: Write LinkedIn comments, note down key learnings from case studies Week 5 to 8: Statistics and Math for Data Science - Finish Khan Academy course on statistics and probability,

Q: What is the summary of the document?

A: The document is a 6-month roadmap for beginners to learn Data Science skills, requiring no prior coding or computer science background. Here's a summary: Total Duration: 6 Months (4 hours of study per day) Weeks 1-2: Python - Learn Python basics (variables, data types, control structures, functions, modules, file I/O, exception handling, classes) - Resources: Codebasics Python tutorials (Track A - Free) or Python course (Track B - Paid) - Assignment: Complete exercises and create a professional LinkedIn profile Weeks 3-4: Pandas, Data Visualization - Learn NumPy, Pandas, Matplotlib/Seaborn for data manipulation and visualization - Resources: YouTube playlists for each library - Soft Skills: Follow data science influencers on LinkedIn, learn business fundamentals, engage in Discord community - Assignment: Write LinkedIn comments, note down

Q: Give me summary in 5 points.

A: Here's a summary of the Data Science Roadmap for Beginners in 5 points: 1. Duration and Daily Study Time: The roadmap is designed to be completed in 6 months, with a daily study commitment of 4 hours, split between tool skills (3 hours) and core skills (1 hour). 2. Weekly Topics and Skills: - Weeks 1-2: Python basics (variables, data types, control structures, functions, file I/O, exception handling, classes, and objects). - Weeks 3-4: Data manipulation and visualization using Pandas, NumPy, Matplotlib, or Seaborn. - Weeks 5-8: Statistics and math for data science using Khan Academy and Stat Quest. - Weeks 9-12: Machine learning basics (feature engineering, regression, classification, clustering) using a YouTube playlist. - Weeks 13

[Go Back](#) [Clear History](#)

History page once cleared looks like this:

The screenshot shows a web browser window with the URL 127.0.0.1. The main content area displays a "History" page, which is currently empty. Below the title, there are two buttons: "Go Back" and "Clear History".

History

[Go Back](#) [Clear History](#)

The terminal window while the entire program runs:

A screenshot of a terminal window within a code editor interface. The terminal tab is active, showing the following content:

```
fastAPI > Ai agent > templates > history.html
1  <!DOCTYPE html>
2  <html lang="en">
3  <head>
4      <meta charset="UTF-8">
5      <meta name="viewport" content="width=device-width, initial-scale=1.0">
6      <title>SmartNotes AI - History</title>
7      <script src="https://cdn.tailwindcss.com"></script>

PROBLEMS 6 OUTPUT DEBUG CONSOLE TERMINAL PORTS COMMENTS
○ (fastenv) akashadhyapak@Akashs-MacBook-Air Ai agent % uvicorn main:app --reload
INFO: Will watch for changes in these directories: ['/Users/akashadhyapak/Documents/Projects/fastAPI /Ai agent']
INFO: Uvicorn running on http://127.0.0.1:8000 (Press CTRL+C to quit)
INFO: Started reloader process [32145] using StatReload
INFO: Started server process [32147]
INFO: Waiting for application startup.
INFO: Application startup complete.
INFO: 127.0.0.1:54072 - "GET / HTTP/1.1" 200 OK
INFO: 127.0.0.1:54072 - "GET / HTTP/1.1" 200 OK
INFO: 127.0.0.1:54085 - "POST / HTTP/1.1" 200 OK
INFO: 127.0.0.1:54098 - "POST / HTTP/1.1" 200 OK
INFO: 127.0.0.1:54106 - "POST / HTTP/1.1" 200 OK
INFO: 127.0.0.1:54117 - "GET /history HTTP/1.1" 200 OK
INFO: 127.0.0.1:54122 - "POST /clear_history HTTP/1.1" 303 See Other
INFO: 127.0.0.1:54122 - "GET /history HTTP/1.1" 200 OK
INFO: 127.0.0.1:54123 - "GET / HTTP/1.1" 200 OK
```

Limitations and Future Enhancements

1. Limitations:

- The quality of answers depends on the clarity and relevance of the extracted text.
- The application may not perform well with heavily formatted or scanned PDFs.

2. Future Enhancements:

- Implement OCR (Optical Character Recognition) for scanned PDFs.
 - Introduce support for multiple PDFs and cross-document insights.
 - Add dark mode and more customization options for enhanced user experience.
 - Improve answer accuracy with advanced context management techniques.
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Conclusion

PDF Insights AI is a powerful and user-friendly application designed to enhance learning and research by providing instant insights from uploaded PDFs. By leveraging the capabilities of **NVIDIA Mistral** and a clean, responsive UI built with **Tailwind CSS**, the application ensures an efficient and seamless user experience.