Documentation: Financial Analysis Chatbot

Overview

The Financial Analysis Chatbot is a web-based tool designed to provide users with quick and accurate financial insights for specific companies. By leveraging a dataset of financial metrics, the chatbot allows users to ask predefined queries related to revenue, net income, liabilities, assets, and growth metrics. The user interacts with the chatbot through a simple, intuitive chat interface where they can type questions and receive instant responses.

How It Works

1. **User Input:** Users submit queries via a text input field in the chatbot's web interface.

2. **Back-End Processing:** The message is sent to the Flask server, which processes the input and determines the appropriate financial metric to extract from the dataset.

3. **Data Retrieval:** The chatbot filters data for the specified company (default is 'Apple') from the CSV file financial_data_with_correct_growth.csv.

4. **Response Generation:** The chatbot extracts the requested financial information (e.g., total revenue, liabilities, etc.) and formats it into a human-readable message.

5. **User Response:** The chatbot sends the response back to the web interface, where it is displayed to the user.

Predefined Queries

The chatbot is designed to recognize and respond to specific queries about financial metrics. Below is a list of supported queries and the corresponding information provided:

1. **Total Revenue**

   o **Example Query:** "What is the total revenue for Apple?"

   o **Response:** Provides the total revenue of the company for the most recent year.

2. **Net Income Change**

   o **Example Query:** "How much did Apple's net income change over the last year?"

   o **Response:** Calculates the percentage change in net income between the two most recent years.

3. **Revenue Growth**

   o **Example Query:** "What is Apple's revenue growth rate?"

   o **Response:** Provides the revenue growth percentage for the most recent year.

4. **Total Liabilities**

   o **Example Query:** "What are Apple's total liabilities?"

   o **Response:** Provides the total liabilities for the most recent year.

5. **Total Assets**

   o **Example Query:** "How much are Apple's total assets?"

   o **Response:** Provides the total assets for the most recent year.

6. **Liabilities Change**

   o **Example Query:** "How did Apple's liabilities change over the past year?"

   o **Response:** Calculates the percentage change in liabilities over the last year.

7. **Assets Growth**

   o **Example Query:** "What is Apple's assets growth?"

   o **Response:** Provides the asset growth percentage for the most recent year.

8. **General Greeting**

   o **Example Query:** "Hello" or "Hi"

   o **Response:** The chatbot responds with a friendly greeting such as "Hello! How can I help you today?"
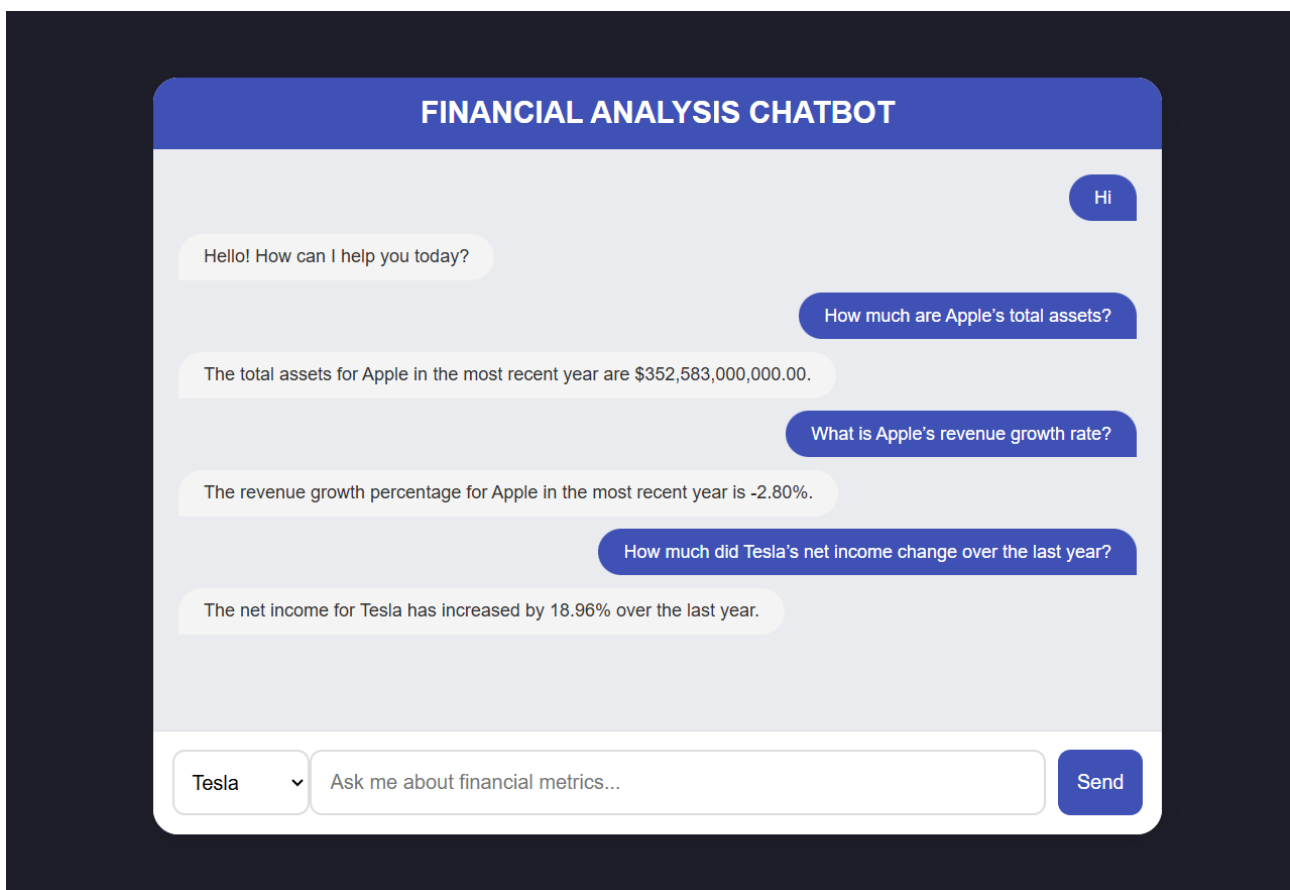
Limitations

1. **Predefined Queries Only:** The chatbot only responds to the predefined financial queries listed above. General, open-ended, or unrecognized questions will return a default message, such as

"Sorry, I can only provide information on revenue, net income, liabilities, assets, and growth metrics."

2. **Data for One Company at a Time:** The default company is 'Apple'. If a company is not specified in the user's query, the chatbot assumes the user is referring to Apple. Support for multiple companies requires additional data filtering logic.

3. **Limited Natural Language Understanding:** The chatbot does not have advanced NLP capabilities. It relies on simple keyword matching (e.g., "total revenue" or "revenue growth"). If a user's query does not contain one of these key phrases, the chatbot may not understand it.

4. **Data Dependency:** The accuracy of responses depends on the accuracy and completeness of the CSV file financial_data_with_correct_growth.csv. Missing or incorrect data will affect the chatbot's ability to generate accurate responses.

Future Enhancements

- **Multi-Company Support:** Add the ability to query financial data for multiple companies by allowing users to specify the company name in their query.

- **Natural Language Processing (NLP):** Improve the chatbot's ability to understand a wider variety of user inputs.

- **Error Handling:** Provide more descriptive error messages when the data is missing or unavailable.

- **Enhanced Data Visualization:** Include charts or graphs to visualize financial trends over time.

This documentation provides an overview of how the Financial Analysis Chatbot works, the types of queries it can handle, and its current limitations. Future updates aim to expand its capabilities and improve user experience.