App Documentation

Objective

The primary goal of the platform is to provide users with a robust and intuitive algorithmic backtesting system. This empowers users to evaluate and optimize their trading strategies through an interactive user interface (UI) that simplifies parameter selection and strategy analysis.

Main Features

1. Interactive and Easy UI

- **User-Friendly Design**: A highly interactive interface designed for users of all skill levels.
- **Effortless Parameter Modification**: Users can select and modify algorithm parameters without extensive coding knowledge.
- **Visual Aids**: The UI includes visual prompts, ensuring a seamless experience for backtest setup and execution.

2. Detailed Algorithm Performance Analysis

- **In-Depth Analysis**: Provides detailed performance metrics for user algorithms, including:
    - Profit and loss breakdowns
    - Risk-adjusted returns
    - Drawdowns and other key indicators
- **Customizable Datasets**: Users can select datasets tailored to their needs for backtesting.
- **Graphical Representations**: Includes charts, heatmaps, and other visual tools for a concise view of results.

3. Interactive Multilingual Chatbot

- **AI-Powered Assistance**: Integrated chatbot to guide users on platform usage and resolve queries.
- **Multilingual Support**: Accessible for users across diverse regions.
- **RAG Technology**: Utilizes Retrieval-Augmented Generation (RAG) to pull information from reliable stock market resources.
- **Educational Insights**: Helps users understand algorithm principles, fostering informed decision-making.

4. AI-Generated Feedback and Algorithm Improvements

- **Actionable Feedback**: Analyzes algorithms and provides suggestions for:

    - Parameter adjustments
    - Alternative approaches
    - Potential performance improvements
- **Tailored Suggestions**: Feedback is specific to the data and scenarios tested.
- **Efficiency Enhancements**: Highlights inefficiencies and potential pitfalls to refine strategies.

5. Versioning Control of Algorithmic Decisions

- **Robust Version Control**: Manages and tracks algorithmic decisions akin to Git.
    - **Decision Branching**: Allows users to test multiple strategy variations without overwriting configurations.
    - **Historical Tracking**: Maintains records of parameter settings, data selections, and performance results.
    - **Comparative Analysis**: Enables side-by-side comparisons of strategy versions to identify the best approach.
    - **Secure Storage**: Ensures all data is safely stored and accessible anytime.
- **Seamless Integration**: Intuitively integrated into the interactive UI for efficient workflow management.

Documentation for Streamlit Frontend: Trade Sarthi

This documentation provides guidance on using the features of the Trade Sarthi application, developed using Streamlit. It includes instructions for configuring stock trading strategies, analyzing performance metrics, and interacting with the integrated chatbot.

Features Overview

1. **Stock Data Visualization**
    - Display historical stock prices as candlestick charts.
    - Highlight key price levels using indicators like SMA, EMA, Bollinger Bands, RSI, MACD, and more.
2. **Trading Strategy Implementation**
    - Choose from predefined strategies: SMA Crossover, RSI, MACD, Bollinger Bands, Stochastic, MA Envelope, and VWAP.
    - Combine two strategies using logical operators (AND/OR) to enhance flexibility.
3. **Performance Metrics**
    - View calculated metrics, including Total Return, Annual Return, Sharpe Ratio, and Maximum Drawdown.
4. **AI-Powered Trade Feedback**

    - Receive concise, AI-generated feedback on executed trades based on entry and exit data.
5. **Chat Assistant**
    - Ask questions about trading strategies or the application.
    - Get real-time responses from an AI chatbot integrated with the app's documentation.
6. **Customizable Parameters**
    - Fine-tune strategy parameters through sliders for precise configuration.
    - Set risk management rules like stop-loss and take-profit percentages.

How to Use the App

1. Configure Stock Data Input

- **Stock Symbol**: Enter the ticker symbol for the stock (e.g., `AAPL` for Apple).
- **Start Date & End Date**: Select the date range for historical data analysis.

2. Select Trading Strategies

- **Strategy 1 & Strategy 2**: Choose from available strategies.
- **Logical Operator**: Define how the two strategies interact (AND/OR).

3. Set Risk Management Parameters

- **Stop Loss (%)**: Specify the maximum loss per trade.
- **Take Profit (%)**: Specify the profit target for exiting a trade.

4. Adjust Strategy Parameters

Each strategy has unique adjustable parameters (e.g., RSI period, Bollinger Band deviations). Configure these using sliders in the sidebar.

5. Run Backtesting

- Click the **Run Backtest** button to execute the strategies on historical data.
- The app displays:
    - **Price Chart with Buy/Sell Signals**
    - **Performance Metrics**
    - **Trade History Table** with AI feedback
    - **Equity Curve** showing the account balance over time

Chat Assistant

- Access the chatbot from the sidebar.
- **Ask Questions**: Enter queries about trading strategies or the app.
- The chatbot leverages pre-loaded documentation to provide relevant answers.

Technical Indicators

- **SMA/EMA**: Identify trends using simple and exponential moving averages.
- **RSI**: Detect overbought/oversold conditions.
- **MACD**: Track momentum and trend direction.
- **Bollinger Bands**: Visualize price volatility.
- **Stochastic Oscillator**: Measure price momentum.
- **VWAP**: Assess average price weighted by volume.

Troubleshooting

- **Error Loading Data**: Ensure API credentials are correctly set in the `.env` file.
- **LLM Initialization Errors**: Verify that the OpenAI API key is configured properly.
- **Trade Execution Issues**: Check strategy parameters and ensure sufficient historical data is available.

Additional Features

- **Interactive Sliders**: Fine-tune parameters in real time.
- **Dynamic Chat History**: Review previous conversations with the AI assistant.
- **AI Feedback**: Gain insights into trade decisions to improve strategy effectiveness.

Start exploring the Trade Sarthi app to enhance your trading strategies and gain valuable insights into stock performance.