**Stock Market Analysis**

**Project Synopsis**

**Problem Statement**

The project addresses the lack of a unified platform for investors to analyze stock data from different perspectives (technical and fundamental analysis). It aims to solve the problem of scattered information and the lack of actionable insights for real-time decision-making in the stock market.

**Objective and Scope of the Project**

**Objective:**

This project aims to develop a user-friendly website that will provide a platform for users to access real-time and historical stock data, utilize analysis tools, and obtain predictions generated by ML models.

**Scope:**

* **Frontend:** A user-friendly dashboard developed using Streamlit.
* **Backend:** Integration of Alpha Vantage API for stock data, StockNews API for fetching news, and OpenAI for generating insights.
* **Data Visualization:** Use of Plotly for real-time data visualization of stock movements and key financial data.
* **Tools:** Python libraries including pandas, Plotly, Streamlit, and external APIs like Alpha Vantage and OpenAI.
* **Modelling:** Machine learning model adopted to predict stock prices.

**Methodology**

**Agile Methodology:** The project follows an iterative development approach with cycles of development and testing.

1. **Requirement Analysis:** Understanding user needs and components.
2. **System Design:** Creating the backend architecture for data retrieval and processing.
3. **Modelling:** Model training and evaluation using scikit-learn (Linear Regression).
4. **Implementation:** Using APIs to fetch and process stock data, and display it via the Streamlit interface.
5. **Testing:** Ensuring data accuracy, API integration, and UI responsiveness.

**Hardware & Software to be Used**

* **Hardware:** Basic computing device with internet access.
* **Software:**
  + Programming Language: Python 3.x
  + Operating System: Windows
  + Libraries: pandas, NumPy, Plotly, OpenAI, StockNews, scikit-learn, pandas\_ta
  + Frontend: Html, CSS, Streamlit

**Testing Technologies Used**

* **Unit Testing:** Testing individual components (e.g., fetching stock data, news data, etc.).
* **Integration Testing:** Ensuring APIs work together seamlessly.
* **User Acceptance Testing (UAT):** Testing usability with users to meet requirements.

**Impact and Conclusion**

The project contributes a valuable tool for investors of all levels to make more informed investment decisions. It provides a user-friendly platform with integrated data sources, technical analysis, and AI-powered insights, potentially leading to better returns in the stock market.

This project has the potential to provide valuable insights and tools for investors of all levels. By combining the power of machine learning with a user-friendly web interface, the website can empower users to make more informed investment decisions and potentially achieve better returns in the stock market.