Project Report: Stock Market Monitor and Next-Day Price Predictor

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1. Introduction: Problem Statement and Objective

1.1 The Real-Life Problem

In personal finance and individual stock analysis, two common challenges are:

1. **Data Accessibility:** Quickly retrieving and visualizing historical data for a specific stock without relying on complex trading platforms.
2. **Basic Forecasting:** Gaining a rapid, data-driven insight into the potential short-term trajectory of a stock price.

This project solves this by creating a **single, accessible web tool** that monitors current market trends and provides a rudimentary next-day forecast based on historical data.

1.2 Project Objective and Constraints

The primary objective was to implement a functional, integrated solution to the problem stated above

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2. Technical Solution and Methodology

2.1 Full-Stack Architecture

The project adheres to the Python-only constraint by utilizing the following stack:

Component	Technology Used	Real-Life Problem Solved
Front-End (UI)	**Streamlit**	Provides **quick, accessible visualization** and user input interface without complex web development.
Data Acquisition	**yfinance & Pandas**	Solves the **data accessibility** problem by fetching real-time, clean historical data on demand.
Prediction Model	**Scikit-learn (Linear Regression)**	Offers a **rapid, data-driven forecast** for the next trading day's closing price.

2.2 Data and Model Implementation

1. **Data Retrieval:** The back-end retrieves historical stock data based on the user's ticker and date range input. The core financial data used for prediction is the **Adjusted Close** price, which is essential for accurate long-term analysis.
2. **Model Selection: Simple Linear Regression** was chosen to demonstrate the concept of time-series forecasting. The model finds the best-fit linear line through the historical prices plotted against the sequential time index.

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3. Results and Conclusion

3.1 Functionality and Results

The project successfully delivered a working solution that integrates three distinct engineering domains:

1. **Web Application:** An interactive interface for input and display.
2. **API Integration:** Dynamic fetching of financial data.
3. **Machine Learning:** Training and deploying a simple predictive model.

This provides the user with an intuitive tool to instantly monitor a stock's historical trends and receive a projected value for the very next day.

3.2 Conclusion and Real-World Impact

The project successfully achieved its objective under the strict Python-only constraint. It provides a valuable, accessible tool for **basic financial monitoring and forecasting**. While the Linear Regression model is insufficient for professional trading, it serves as an excellent foundation for individuals to quickly integrate data science methods into their personal financial analysis workflows, thereby solving the problem of data complexity and inaccessibility.