

Problem Statement:

The project aims to develop a Stock Price Prediction Streamlit application that leverages deep learning models to recognize and classify price activities based on real data collected from yfinance API or Groww API. By utilizing deep learning architectures such as Recurrent Neural Networks (RNNs), Convolutional Neural Networks (CNNs), and Long Short-Term Memory (LSTM) networks, the platform seeks to accurately predict stock prices, enabling applications in stock price monitoring, top gainers, and top losers.

Requirements:

Data Collection: Gather a diverse dataset containing historical stock price data from yfinance API or Groww API, including features such as open, high, low, close, and volume.

Data Preprocessing: Clean and preprocess the collected data, including steps such as normalization, feature scaling, and handling missing values to prepare the data for training deep learning models.

Feature Engineering: Extract relevant features from the stock price data that capture important patterns and characteristics indicative of stock price movements, such as technical indicators, moving averages, and momentum indicators.

Model Selection: Evaluate and select appropriate deep learning architectures for stock price prediction tasks, including RNNs (e.g., LSTM, GRU), CNNs, or hybrid models combining both architectures, based on the complexity and characteristics of the stock price data.

Model Training: Train the selected deep learning model using the preprocessed data, optimizing model parameters and hyperparameters to maximize predictive performance on stock price prediction tasks.

Model Evaluation: Assess the performance of the trained stock price prediction model using evaluation metrics such as mean absolute error (MAE), mean squared error (MSE), and R-squared to evaluate its effectiveness in predicting stock prices.

Deployment: Deploy the trained deep learning model into a production environment using Streamlit, where it can analyze real-time stock price data and provide automated stock price predictions for users.

Integration: Integrate the stock price prediction system with existing financial applications, platforms, or APIs to facilitate seamless data exchange and interoperability with other systems.

Real-time Monitoring: Implement mechanisms for real-time monitoring and visualization of predicted stock prices, providing users with feedback and insights into stock market trends and patterns.

Privacy and Security: Ensure that the stock price prediction system complies with privacy regulations and standards governing the collection and processing of financial data, implementing encryption and access controls to protect sensitive information.

Background:

Stock price prediction plays a vital role in financial markets, enabling investors and traders to make informed investment decisions. By leveraging deep learning techniques, such as RNNs and CNNs, stock price prediction models can analyze historical stock price data and provide insights into future stock price movements.

Real-world Use Case:

Stock Price Monitoring: The Stock Price Prediction Streamlit application can be used to monitor and track stock prices in real-time, providing users with up-to-date information on stock market trends and patterns.

Portfolio Optimization: The application can be used to optimize investment portfolios by predicting stock prices and identifying potential investment opportunities.

Risk Management: The application can be used to identify potential risks and anomalies in stock price data, enabling investors and traders to make informed decisions to mitigate potential losses.