

Stock Market Prediction

1. Problem Statement:

The stock market is a complex and dynamic environment where numerous factors influence stock prices. Investors and traders often seek accurate predictions to make informed decisions. Traditional methods may fall short in capturing the intricate patterns and dependencies in stock market data. Therefore, there is a need for a reliable and efficient prediction model that leverages advanced techniques to forecast stock prices.

2. Project Description:

Our project aims to develop a stock market prediction system utilizing Recurrent Neural Networks (RNN) with Long Short-Term Memory (LSTM) cells. We will gather historical stock data from Yahoo Finance using selenium and employ deep learning techniques to analyze and predict the closing prices of selected stocks. The project's primary focus is on building a robust model capable of capturing temporal dependencies and complex patterns inherent in financial time series data.

3. Methodology:

- **Data Collection:** Utilize the Yahoo Finance API to gather historical stock market data, including opening prices, closing prices, high and low values, and trading volumes.
- **Data Preprocessing:** Clean and preprocess the data, handling missing values, outliers, and normalizing the features to ensure the model's stability and effectiveness.
- **Model Development:** Implement an RNN with LSTM cells using a deep learning framework such as TensorFlow. Fine-tune the model architecture to optimize performance.
- **Training and Validation:** Split the dataset into training and test sets. Train the model on the training set, validating its performance on the test set.
- **Evaluation:** Assess the model's performance using relevant metrics, such as Mean Squared Error, and compare predictions against actual closing prices.

4. Expected Outcomes:

- A trained model capable of accurately predicting stock closing prices.
- Evaluation metrics demonstrating the model's reliability and effectiveness.