



MANIPAL UNIVERSITY
JAIPUR

Minor Project

Project - Synopsis

MCA - III Sem

Subject Code: CA7131

Submitted By

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DEPARTMENT OF COMPUTER APPLICATIONS

Stock Price Prediction

Team Details

- **Tanya Bodhwani:** 23FS20MCA00074

Introduction

1.1 Introduction to Work Done/Motivation (Overview, Applications & Advantages)

The stock market is a dynamic ecosystem where investors participate in buying and selling shares, aiming to capitalize on price fluctuations for profit. Accurate prediction of stock prices has long been a focal point for investors, traders, financial institutions, and regulatory bodies alike. The motivation behind delving into stock price prediction stems from the profound impact it can have on investment decisions, risk management strategies, and overall market understanding.

Applications of Stock Market Prediction:

Stock price prediction holds vast applications across diverse domains. Beyond its immediate implications for investors and traders, accurate forecasting can inform economic policies, aid financial institutions in managing risks, and contribute to the development of innovative financial products and services. Additionally, it facilitates data-driven decision-making, enabling stakeholders to navigate the complexities of the market landscape more effectively.

Advantages of Stock Market Prediction:

The advantages of stock price prediction are manifold. By leveraging advanced algorithms and data analytics techniques, investors can gain insights from market trends, identify lucrative opportunities, and optimize their investment strategies. Furthermore, accurate predictions empower financial institutions and regulatory bodies to make informed decisions, leading to more robust risk management frameworks and policy interventions.

Objectives

The primary objective of this project is to develop a robust stock price prediction model using advanced machine learning algorithms. The project aims to achieve the following objectives:

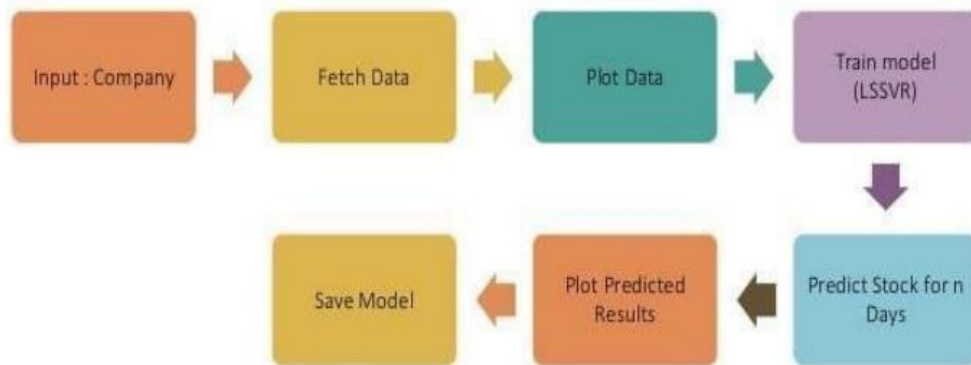
- Utilize historical stock price data and relevant financial indicators to train predictive models.
- Explore the efficacy of various machine learning algorithms, including Long Short-Term Memory (LSTM) networks, in forecasting stock prices.
- Evaluate the performance of developed models using key metrics such as Mean Squared Error (MSE), Mean Absolute Error (MAE), and accuracy.
- Conduct comparative analyses between machine learning models and traditional forecasting methods like autoregressive integrated moving averages (ARIMA).
- Investigate the impact of incorporating additional features such as market sentiment analysis and macroeconomic indicators on prediction accuracy.

DFD (Data Flow Diagram)

Data flow diagram (DFD): DFD is graphical representation of system which give detail information about data flow between input and output. As level increases it elaborates detail information about data flow.

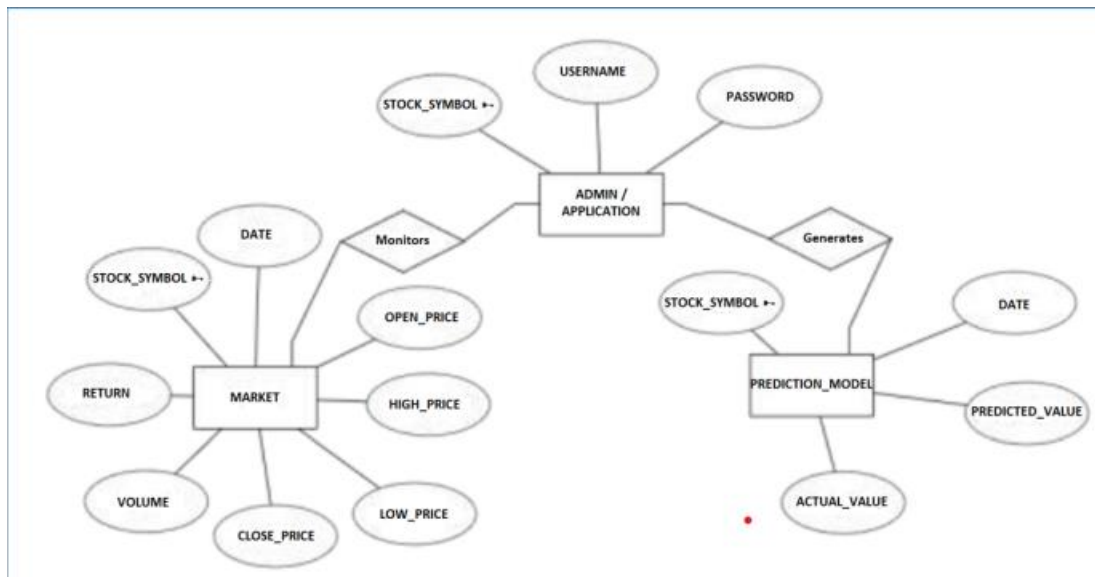
A. DFD:

Data Flow Diagram



ER Diagram

- ER model stands for an Entity-Relationship model. It is a high-level data model. This model is used to define the data elements and relationship for a specified system.



Project Timeline

Task	Start Date	End Date	Duration
Requirements Gathering	[12-9-2024]	[16-9-2024]	4 Days
System Design (DFD, ERD)	[17-9-2024]	[22-9-2024]	6 Days
Model Development	[23-9-2024]	[3-10-2024]	10 Days
Evaluation & Optimization	[4-10-2024]	[14-10-2024]	10 Days
Testing and Bug Resolution	[15-10-2024]	[21-11-2024]	7 Days
Final Deployment	[22-11-2024]	[28-11-2024]	6 Days

Tools / Platform, Hardware and Software Requirement Specifications

Technologies/Tools Used:

- **Python:**
 - Interpreted high-level general-purpose programming language.
 - **Version:** Python 3.6.0 or later for development.
- **Jupyter Notebook:**
 - Popular IDE for data analysis and visualization.

Hardware Requirements:

- **Processor:** i5 or later recommended for better performance.
- **RAM:** 8GB or more for handling larger datasets.

Software Requirements:

- **Operating System:** Windows 10 or above (or Linux/Mac OS).
- **Python Version:** 3.6 or later.

Additional Tools:

- **Pandas:** For data manipulation and analysis.
- **NumPy:** For numerical computations.
- **Scikit-learn:** For machine learning algorithms.
- **TensorFlow/Keras:** For deep learning models.
- **Matplotlib/Seaborn:** For data visualization.

Packages Used:

- **Statsmodels:** For statistical modeling.
- **Pandas:** For data manipulation.
- **Scikit-learn:** For machine learning algorithms.
- **TensorFlow/Keras:** For implementing neural networks.

References

- **Alpha Vantage API Documentation:** Alpha Vantage Documentation
- **Scikit-learn Documentation:** Scikit-learn Documentation
- **TensorFlow Documentation:** TensorFlow Documentation
- **Wikipedia API Documentation:** Wikipedia API Documentation