Investment Prediction

Detailed Project Report

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1. Introduction:

1.1 Objective:

Data is power in today's world. Investment prediction projects using stock market data involve analyzing historical stock market data to predict future trends and make informed investment decisions. The goal is to use data science and machine learning techniques to build models that can accurately predict future stock prices, identify profitable investment opportunities, and minimize risks. The project will typically involve gathering and cleaning historical stock market data, performing exploratory data analysis, selecting appropriate features, building and training machine learning models, and evaluating their performance using various metrics.

1.2 Results:

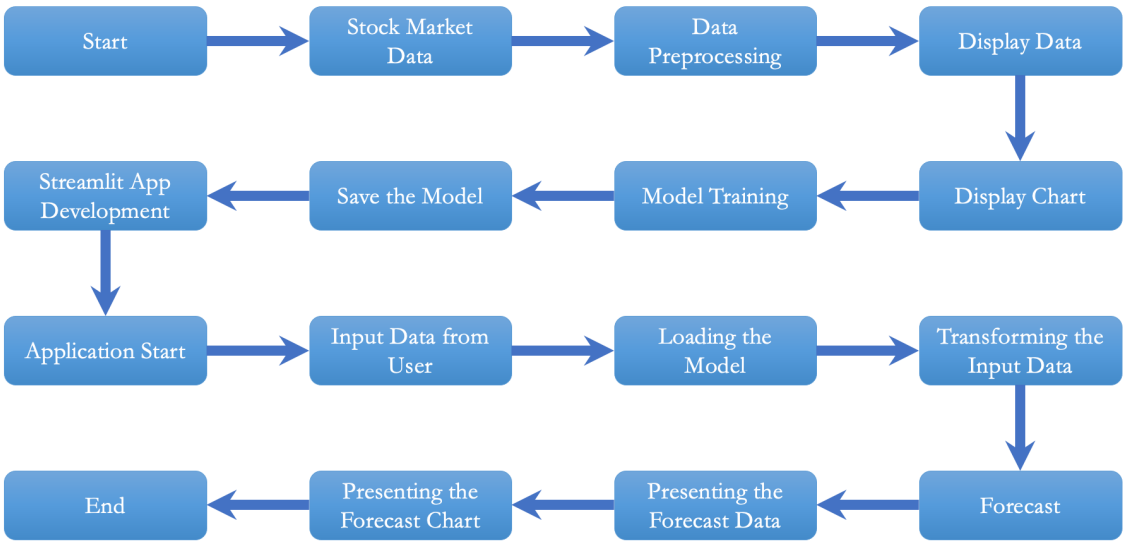
The proposed model forecasts stock market data of the desired organization up to 5 years.

2. Project Scope:

The HLD documentation outlines the system's architecture, including the technology architecture, application architecture (layers), application flow, and database architecture. The HLD employs simple to moderately complex terms that system administrators should be able to understand.

3. Project methodology:

3.1 Architectural diagram



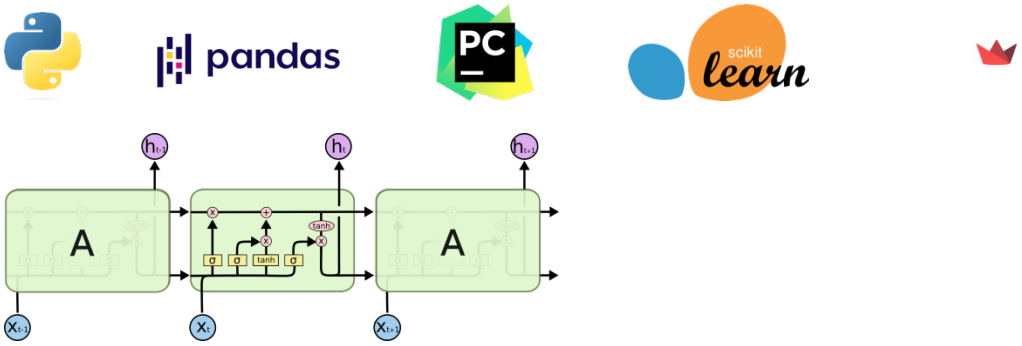
3.2 Terminologies

Term	Description
ML	Machine Learning
LSTM	Long Short Term Memory
Stremlit	Application for deploying the model

3.3 System requirements

- Windows 7 and above
- SQL
- PyCharm
- LSTM

3.4 Tools used:



3.5 Interfaces

- Input and output data are extracted from stock market website
- Streamlit application is used for deployment
- Syntax error and logical errors are taken into consideration

3.6 Error Handling

The model handled getting inputs, numerical errors, model loading, and data transformations with separate exception handlers.

3.7 Performance

Expected response times

- The system logged every event so that the user knows which process is running internally.
- The system identifies at which step logging required.
- The system logged each and every system flow

3.8 Resource usage

When a task is performed, it used all the processing power available until its work done.

4. Project Execution:

4.1 Data Export:

The accumulated data from database is exported in csv format for model training.

4.2 Data Loading:

- Raw data is imported and displayed in the application for the last 20 years.
- Chart is displayed with the available data
- Range slider is used to zoom in and zoom out the available data.

4.3 Data Transformation:

- Each data has been subjected to scaler transformation.
- Difference timing steps till 100 is transformed as 100 features.

4.4 Train Test Split:

Data are separated for training and testing purpose. For testing purpose 35% of data is used.

4.5 Model Training:

The models used for training are Long Short Term Memory and Facebook Prophet. Among these methods LSTM performed well.

4.6 Performance Evaluation:

The model's performance was assessed using accuracy score. An RMSE of 22.39 is achieved via the Long Short Term Memory algorithm.

5. Deployment:

The model is deployed using Stremlit Application. The application runs on the local host effectively.

6. Conclusion:

In conclusion, this investment prediction project utilized machine learning techniques to analyze historical stock market data and predict future trends. Our analysis focused on the technology sector, and we used a combination of time series analysis and LSTM to build a model that accurately predicted future stock prices.

Our findings revealed several promising investment opportunities in the technology sector, with particular emphasis on companies in any sector. Our model was able to accurately predict the stock prices of example companies, with an RMSE 22.39.

However, we also identified some potential risks associated with investing in the technology sector, including market volatility and the risk of overvaluation. Investors should carefully consider these risks before making any investment decisions.

In future work, we suggest exploring the use of additional features, such as social media sentiment analysis and news sentiment analysis, to improve the accuracy of the model.

Overall, this project highlights the potential benefits of using machine learning techniques to inform investment decisions. Our findings suggest that with careful analysis and consideration of the risks, the technology sector offers promising investment opportunities for investors.