DEPT. OF CSE & IT

BENGAL INSTITUTE OF TECHNOLOGY

TECH TOWN, BASANTI HIGHWAY, BANTALA (BUS-STOP: 1 NO. COLONY), HADIA, KOLKATA-150

Project Synopsis
B. Tech (CSE/IT), 7th Semester
(2024-25)

Project Title: **Predicting Stock Market Trends Using Long Short-Term Memory Networks**

Project Members:

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Project Mentor:

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Designation: **Assistant Professor**

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Abstract / Project Scope:

Stock market prediction is a crucial area in financial research with the potential to generate significant returns. This project investigates the use of Long Short-Term Memory (LSTM) networks, a form of machine learning (ML) technique, for forecasting stock prices. The challenge lies in accurately predicting stock price trends amidst the volatile and noisy nature of financial markets. The motivation behind this project stems from the desire to

improve predictive accuracy through advanced ML models that can handle time series data effectively. The overall goal is to develop an LSTM-based model that can forecast stock prices with a degree of precision that surpasses traditional methods. Key objectives include preproccessing historical stock data and financial indicators, training and evaluating the LSTM model, and assessing its performance against other forecasting techniques. This project is situated in the domain of financial data analytic and machine learning, focusing specifically on time series forecasting.

Introduction:

Predicting stock market trends presents a complex challenge due to the myriad uncertainties and variables influencing market values. Economic conditions, investor sentiment, and political events contribute to the volatility and randomness of stock prices. Traditional methodologies for stock prediction include Technical Analysis, Time-Series Forecasting, Machine Learning and Data Mining, and Modeling Volatility. This project emphasizes the use of Machine Learning, specifically LSTM networks, to improve stock price predictions. By leveraging LSTM's capability to capture temporal dependencies in time series data, this project aims to provide a more accurate forecasting tool.

Software/Hardware Required

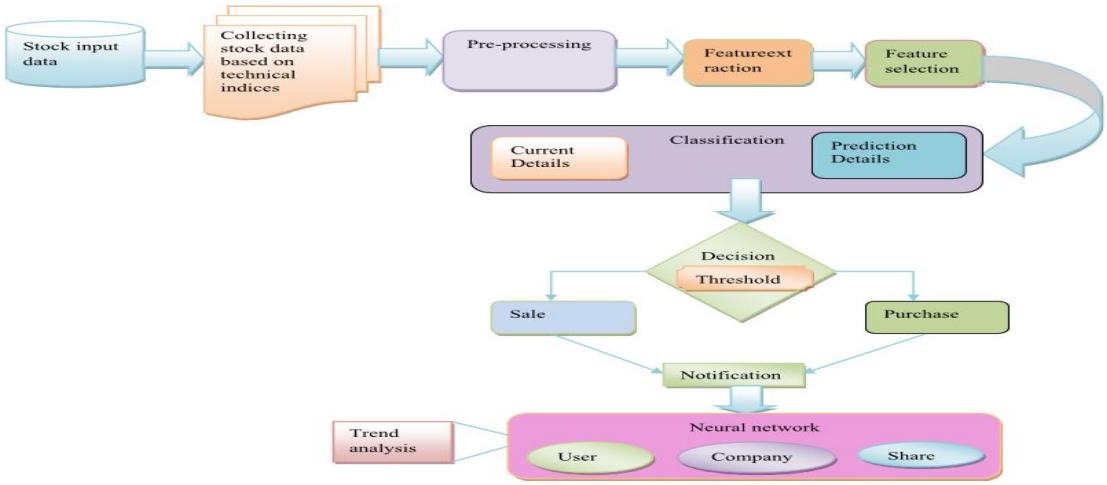
- **Software: Python, TensorFlow/Keras for LSTM implementation, Jupyter Notebook for development, and data preprocessing tools.**
- **Hardware: High-performance computing resources or GPUs for training the LSTM model.**

Key Features / Objectives

1. **To preprocess historical stock price data and financial indicators to build a comprehensive feature set.**
2. **To develop and train an LSTM network using the prepared datasets.**
3. **To evaluate the performance of the LSTM model against established metrics and compare its accuracy with other forecasting methods.**
4. **To visualize the prediction results and interpret the model's effectiveness in capturing stock price trends.**

Block Diagram / Process Diagram

- **Data Collection: Historical stock prices and financial indicators.**



Block Diagram of the overall model

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