**Big Sales Prediction using Machine Learning**

**Submitted for**

**Statistical Machine Learning CSET211**

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**INDEX**

|  |  |  |
| --- | --- | --- |
| S. No. | Content | Page No. |
| 1 | **Abstract** | 3 |
| 2 | **Introduction** | 3 |
| 3 | **Related Work (If Any)** | 4 |
| 4 | **Methodology** | 7 |
| 5 | **Hardware/Software Required** | 7 |
| 6 | **Conclusions** | 9 |
| 7 | **Future Scope** | 9 |
| 8 | **GitHub Link** | 1 |

1. **Abstract**

This project develops a web application to predict stock prices using historical data. Leveraging Long Short-Term Memory (LSTM) neural networks, it efficiently handles sequential data for accurate predictions. Historical data from January 3, 2012, to December 30, 2022, is utilized to build the model. The application aims to assist investors and financial analysts in making informed decisions by providing reliable future price forecasts.

**2.Introduction**

Stock price prediction is critical in financial markets, offering valuable insights for investment strategies and risk management. This project focuses on implementing LSTM networks due to their ability to process sequential data, making them suitable for time-series analysis. The web application integrates data preprocessing, visualization, and model predictions into a user-friendly interface.

**3.Related Work**

The project builds upon advancements in neural network applications for time-series forecasting. LSTM has been widely adopted for financial modeling due to its effectiveness in learning long-term dependencies, addressing issues in traditional machine learning methods such as ARIMA or linear regression.

**4.Methodology:**

The methodology involves the following steps:

1. Data Collection: Historical stock price data (2012–2022).
2. Data Preprocessing: Removal of duplicates and missing values, normalization, and visualization using moving averages.
3. Model Building:
   * LSTM model architecture, designed for sequential data.
   * The model processes input features (e.g., opening, closing prices, volume).
4. Model Training: Training the LSTM network with preprocessed data.

**5.Hardware/Software Required**

 Hardware:

* GPU-enabled system (optional for faster training).

 Software:

* Python
* TensorFlow/Keras
* Pandas
* Matplotlib
* NumPy

**6.Conclusion**

The LSTM model successfully predicts stock prices with high accuracy, proving its effectiveness in handling sequential financial data. The web application demonstrates the practicality of using neural networks for real-world stock market predictions.

**7.Future Scope**

Future enhancements could include:

* Incorporating sentiment analysis from financial news or social media.
* Expanding the model to support real-time stock price predictions.
* Enhancing visualization features for better interpretability.
* Extending the application to support multi-stock analysis and portfolio optimization.

**8.Github Link of Our Project**

https://github.com/naman1506/StockMarket.git