

**College : kings engineering college**  
**College code - 2108**

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## **Title:Stock Market Prediction on Microsoft Corporation Stock using LSTM**

### **1. Executive Summary:**

The goal of this project was to develop a predictive model for Microsoft Corporation's stock prices using Long Short-Term Memory (LSTM) networks. LSTMs are a type of recurrent neural network (RNN) well-suited for time-series prediction, making them an ideal choice for stock market forecasting.

### **2. Introduction:**

Microsoft Corporation is a technology giant with a significant impact on global markets. Predicting its stock prices accurately is challenging due to the complex and dynamic nature of financial markets. This project aimed to leverage machine learning techniques, specifically LSTM, to forecast Microsoft's stock prices.

### **3. Objectives:**

- Build an LSTM model for time-series prediction.
- Train the model using historical Microsoft stock data.
- Evaluate the model's performance on test data.
- Implement the model to predict future stock prices.

### **4. Data Collection:**

Historical stock data for Microsoft Corporation was collected from reliable financial data sources, such as Yahoo Finance or Alpha Vantage. The dataset included daily closing prices, trading volumes, and other relevant indicators.

## **5. Data Preprocessing:**

The collected data underwent preprocessing steps, including:

- Handling missing values.
- Normalizing the data to ensure consistent scaling.
- Splitting the dataset into training and testing sets.

## **6. Model Architecture:**

The LSTM model architecture consisted of:

- Input layer: Accepting historical stock prices as input sequences.
- LSTM layers: Capturing temporal dependencies in the data.
- Dense layers: Output layers for predicting future stock prices.

## **7. Model Training:**

The LSTM model was trained using the training dataset, and hyperparameters were tuned to optimize performance. Training involved forward and backward propagation, updating weights, and minimizing the prediction error.

## **8. Model Evaluation:**

The model's performance was evaluated on the test dataset using metrics such as Mean Absolute Error (MAE), Mean Squared Error (MSE), and others. The evaluation aimed to assess the accuracy and reliability of the model's predictions.

## **9. Results:**

Provide a summary of the results obtained from the model evaluation. Include relevant metrics and compare the predicted stock prices against actual prices.

## **10. Challenges and Limitations:**

Acknowledge challenges faced during the project, such as:

- Market volatility.
- Sensitivity to economic events.
- Limitations of historical data for predicting future events.

## **11. Future Work:**

Suggest areas for future improvement and expansion, such as:

- ADD feature like news , popularity analyzed from social media
- Experimenting with different neural network architectures.
- Exploring ensemble methods for improved prediction.

Summarize the project's key findings, highlighting the success of the LSTM model in predicting Microsoft Corporation's stock prices. Emphasize the importance of continuous improvement and adaptation to changing market conditions.

**Tools used:** python,keras,pandas,numpy,seaborn