**# Stock Price Prediction using LSTM**

**## Introduction**

This project aims to predict the stock prices of Tesla using machine learning techniques, specifically Long Short Term Memory neural networks. The project utilizes historical stock price data to train and evaluate predictive model.

**## Dataset**

The dataset used in this project comprises historical stock price data for Tesla. This dataset contains features such as data, opening price, closing price, highest price, lowest price, trading volume and adjusted closing price.

**## Setup and Dependencies**

This project is implemented in a Jupyter notebook environment. Below are the dependencies required to run the notebook:

Python 3.x

Pandas

NumPy

Matplotlib

Seaborn

Scikit-learn

**## Data Preprocessing**

Before training the predictive model, the dataset undergoes preprocessing steps, which include:

Handling missing values

Scaling the data

Splitting into training and validation sets

**## LSTM Model**

The predictive model utilized in this project is based on LSTM neural networks. Key aspects of the LSTM model include:

Architecture and parameters

Training process

Hyperparameter tuning

**## Training**

During the training phase, the LSTM model learns from historical stock price data to make predictions. Training parameters such as the number of epochs and batch size may be adjusted to optimize performance.

**## Evaluation**

The performance of the LSTM model is evaluated using various metrics, including:

Root Mean Squared Error (RMSE)

Evaluation results provide insights into the accuracy and reliability of the model's predictions.

**## Prediction**

Once trained, the LSTM model is used to predict future stock prices of Tesla. Predictions may be visualized and analysed to assess the model's effectiveness in forecasting.

**## Conclusion**

In conclusion, this project demonstrates the application of LSTM neural networks for stock price prediction, focusing on Tesla, Inc. Further enhancements and refinements to the predictive model can be explored to improve accuracy and performance.