# Stock Price Prediction

## Overview

* The Stock Price Prediction using Linear Regression project aims to forecast the closing price of stocks in financial markets based on historical data. The project utilizes the Linear Regression algorithm to build a predictive model that takes into account the open, high, low, and volume parameters as input and generates an estimated closing price.

## Project Workflow

### Data Collection:

* Historical stock price data is collected from reliable financial sources or APIs. The data should include attributes such as open price, high price, low price, volume, and closing price for a specific stock or stocks.
* The user should first install the dataset and name the file as the name of the stock to the “Datasets” folder in .csv format.

### Data preprocessing:

* The collected data is pre-processed to ensure its quality and compatibility with the linear regression model.
* Outliers and missing values are handled appropriately.
* Feature scaling and normalization may be applied to ensure uniformity among the input features.

### Feature Selection:

* Relevant features are selected based on their impact on the closing price prediction.
* The relevant features such as Open price, High price, Low price and Volume values are selected as features of the model and a new feature called buffer is also created that is the difference between actual values and predicted values which increases the accuracy of the model.

### Model Training:

* To train the model after adding the dataset to the “Datasets” folder the user has to click on the “train model” Button on the webpage to train the model.
* The pre-processed data is split into training and testing datasets.
* The Linear Regression algorithm is trained on the training dataset to learn the relationship between the input features and the target variable(Closing price).
* The model learns the optimal coefficients for each feature, which will be used to predict the closing price.

### Prediction and Visualization:

* The trained model is used to predict the closing price for new, unseen data.
* To predict the Closing value user has to click on the “Start prediction” Button from the Homepage and Select the desired stock and Enter the values accordingly.

### Model Refinement:

* The model's performance is continuously monitored and assessed.
* If the model's predictions are not satisfactory, adjustments can be made:
* Experimenting with different feature combinations or transformations.
* Fine-tuning the model’s hyperparameters.
* Exploring other regression algorithms or advanced techniques like ensemble methods.

## Installation Instructions

* Install [this](https://drive.google.com/file/d/1ib2Z0i31opLPE_ft8-kzGqz0nqZjfN8c/view?usp=drive_link) zip file and extract it in your device.
* Install the dataset of the stock that you want to train the model for, rename it as the name of the stock and Paste it in the “Datasets” folder.
* Run the “Stock\_price\_models.py” file. It will create a model for the stock that you just entered the dataset for.
* Then just run the “prediction.py” file and a browser window will be opened.
* Click on the “Start prediction” Button on the webpage, select the desired stock and enter the values accordingly.
* Finally, you get the closing price prediction for the selected stock and according to the input given.

## Conclusion

* In this project, we developed a Stock Price Prediction system using Linear Regression. The goal was to forecast the closing price of stocks based on historical data, considering the open, high, low, and volume parameters as input.
* In summary, this Stock Price Prediction project demonstrated the application of Linear Regression in forecasting stock prices based on historical data. It provides a foundation for further research and development in the field of stock market prediction using machine learning. However, it is crucial to exercise caution and combine predictions with domain expertise and market analysis when making investment decisions.