**PROJECT 6:** STOCK PRICE PREDICTION

**PROJECT TITLE :** STOCK PRICE PREDICTION

**PROBLEM STATEMENT:** To build a predictive model to forecast stock prices based on historical market data, assisting investors in making well-informed decisions and optimizing their investment strategies.

**Phase 2:** INNOVATION

**PROBLEM DEFINITION:** Consider exploring more advanced deep learning techniques like CNN-LSTM or attention mechanisms for improved accuracy in predicting stock prices.

**DEFINITION:**

For Stock Price Prediction ,Machine Learning can additionally implement algorithms to identify unusual patterns of behaviour based on past behaviours. The stock market has an extremely volatile nature. The major goal is to minimize the uncertainty of the returns by accurately predicting the future stock prices and also identifying their fluctuations in advance to reduce risks.

**ALGORITHMS OR STEPS TO PERFORM THE STOCK PRICE PREDICTION ON A GIVEN DATASET USING MACHINE LEARNING ALGORITHM:**

 Machine Learning can additionally implement algorithms to identify unusual patterns of behaviour based on past behaviours. The stock market has an extremely volatile nature. The major goal is to minimize the uncertainty of the returns by accurately predicting the future stock prices and also identifying their fluctuations in advance to reduce risks.

**ALGORITHMS USED:**

1. **Import the Libraries:**

The first step is to import the libraries required to preprocess Microsoft Corporation stock data and the other libraries required for constructing and visualizing the LSTM model outputs.

1. **Load The Training Dataset:**

The Google training data has information in five columns. The Open column tells the price at which a stock started trading when the market opened on a particular day. The Close column refers to the price of an individual stock when the stock exchange closed the market for the day. The High column depicts the highest price at which a stock traded during a period. The Low column tells the lowest price of the period. Volume is the total amount of trading activity during a period of time.

1. **Use the Open Stock Price Column to Train Your Model:**

Use the price at which a stock started trading when the market opened on a particular day.

1. **Normalizing the Dataset:**

Data normalization is the practice of organizing data entries to ensure they appear similar across all fields and records, making information easier to find, group and analyze. There are many data normalization techniques and rules.

### Creating X\_train and y\_train Data Structures:

### X\_train and y\_train sets are used for training and fitting the model.

### Reshape the Data:

### Data Reshaping is about changing the way data is organized into rows and columns.

### Building the Model by Importing the Crucial Libraries and Adding Different Layers to LSTM:

### By adding multiple LSTM layers on top of each other, the model can learn more complex relationships between the input data and the output predictions.

### Fitting the Model:

### Model fitting is the measure of how well a machine learning model generalizes data similar to that with which it was trained.

### Extracting the Actual Stock Prices:

### Extracting stock prices refers to the process of retrieving and collecting data related to the trading prices of publicly traded stocks or securities. This data includes information such as the stock’s opening price, closing price, high and low prices during a specific time period, trading volume, and other relevant metrics.

### Preparing the Input for the Model:

### It refers to the process of organizing and formatting data so that it can be effectively and efficiently used as input for a machine learning model.

### Predicting the Values:

### In Machine learning, Predicting the values refers to the process of estimating or forecasting numerical outcomes based on existing data, patterns, and models. This involves using various techniques and methodologies to make informed guesses about what values are likely to be observed in the future or in unobserved data points.

### Plotting the Actual and Predicted Prices:

### It refers to a graphical representation of real or observed values and values predicted by a model. This technique is commonly used to evaluate the performance of predictive models, such as regression models or time series forecasting models, to assess how well they capture and approximate real-world data.

### The process involves:

### Gathering data

### Plotting

### Comparison

### Hardware Requirements:

### 1. CPU

### 2. GPU (Graphics Processing Unit)

### 3. Memory (RAM)

### 4. Storage

### 5. Internet Connection

### Software Requirements:

### 1. Operating System

### 2. Python

### 3. Machine Learning Frameworks

### 4. Jupyter Notebook or IDE

### 5. Data Sources

### 6. Data Preprocessing Tools

### 7. Machine Learning Libraries

### 8. Visualization Tools

### 9. Version control

### 10. Virtual Environment

### 11. Text editor

### Expected OUTPUT:

### PlottingData

### FLOWCHART:

Data Collection

Monitoring and Maintenance

Visualization

Testing

Hyperparameter Tuning

Model Evaluation

Model Training

Feature Selection/Engineering

Model Selection

Data Preprocessing