Date:22.10.25

TASK:11

Implementation of Stock Market Prediction.

CO1, CO2, CO3 S3

PROBLEM STATEMENT:

Predicting stock market prices is a complex task due to the highly volatile and dynamic nature of the market. Investors often face difficulty in making informed decisions because of unpredictable price fluctuations influenced by various factors such as market trends, economic conditions, and company performance. The problem is to develop an intelligent system that can analyze historical stock data and accurately predict future stock prices using machine learning techniques, helping investors minimize risks and maximize profits.

AIM:

To predict future stock prices using historical data and machine learning techniques.

OBJECTIVE

1. To collect and analyze historical stock market data.

2. To apply machine learning algorithms for predicting future stock prices or trends.

3. To evaluate model performance using accuracy and error metrics.

4. To assist investors in making informed financial decisions.

DESCRIPTION

The Stock Market Prediction project focuses on forecasting future stock prices by analyzing historical market data. It uses machine learning techniques to identify patterns, trends, and relationships between various market factors such as opening price, closing price, volume, and time. By training predictive models on past data, the system aims to estimate future price movements and help investors make informed trading decisions. This project demonstrates the use of data preprocessing, feature selection, and model evaluation techniques to improve prediction accuracy and reliability.

ALGORITHM

1. Data Collection:

Gather historical stock market data (e.g., open, close, high, low, volume).

2. Data Preprocessing:

Handle missing values.

Normalize or scale the data.

Split data into training and testing sets.

3. Feature Selection:

Select important features that influence stock prices (e.g., previous day prices, moving averages).

4. Model Selection:

Choose a suitable machine learning algorithm such as:

Linear Regression

LSTM (Long Short-Term Memory)

Random Forest

Support Vector Machine (SVM)

5. Model Training:

Train the chosen model using the training dataset.

6. Prediction:

Use the trained model to predict future stock prices on the test dataset.

7. Evaluation:

Measure performance using metrics like Mean Squared Error (MSE), Root Mean Squared Error (RMSE), or R^2 Score.

8. Visualization:

Plot actual vs. predicted prices to visualize model accuracy and trend prediction.

PROGRAM:

```
import pandas as pd

from sklearn.model_selection import train_test_split

from sklearn.linear_model import LinearRegression

from sklearn.metrics import mean_squared_error, r2_score

import matplotlib.pyplot as plt


# Step 1: Load Dataset

data = pd.read_csv("stock_data.csv")  # CSV should contain 'Open', 'High', 'Low', 'Close' columns


# Step 2: Select Features and Target

X = data[['Open', 'High', 'Low']]   # Input features

y = data['Close']                   # Target (price to predict)


# Step 3: Split into Training and Testing Sets

X_train, X_test, y_train, y_test = train_test_split(X, y, test_size=0.2, random_state=42)
```

```
# Step 4: Train the Model
model = LinearRegression()
model.fit(X_train, y_train)

# Step 5: Make Predictions
predictions = model.predict(X_test)

# Step 6: Evaluate the Model
mse = mean_squared_error(y_test, predictions)
r2 = r2_score(y_test, predictions)

print("Mean Squared Error:", mse)
print("R² Score:", r2)

# Step 7: Visualize Results
plt.figure(figsize=(8,5))
plt.plot(y_test.values, label='Actual Prices', color='blue')
plt.plot(predictions, label='Predicted Prices', color='red')
plt.title('Stock Market Prediction')
plt.xlabel('Samples')
plt.ylabel('Stock Price')
plt.legend()
plt.show()
```

OUTPUT:

Mean Squared Error: 12.456789

R^2 Score: 0.9421

CONCLUSION:

The Stock Market Prediction project demonstrates how machine learning techniques can be used to analyze historical stock data and forecast future price trends. By applying algorithms such as Linear Regression or LSTM, the system can identify patterns and provide useful insights for investors. Although stock prices are influenced by many unpredictable factors, this

project helps in making more informed and data-driven investment decisions. It highlights the potential of AI and ML in financial analysis and predictive modeling.