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**INVOCATION:**

**Stock price prediction Is the task of forecasting future stock prices based on historical data and various market indicators. It involves using statistical models and machine learning algorithms to analyze financial data and make predictions about the future performance of a stock. The goal of stock price prediction is to help investors make informed investment decisions by providing a forecast of future stock prices.**

**II am collect the data from https://www.kaggle.com/datasets/prasoonkottarathil/microsoft-lifetime-stocks-dataset**

***Data description*:**

**The dataset was mainly downloaded from yahoo finance. For real-time prediction/testing of the model, stock values can be extracted through Yahoo Finance API.**

**For this analysis APPLE ,GOOGLE, TESLA and AMAZON stock historical data over 15 years is used, which contains seven records, including date, opening value of the stock, closing value of the stock, high and low values of stock that day, the adj closing value of the stock, and the volume of stocks that had been traded that day.**

***Feature extraction and Feature selection.:***

**Some feature extractions done under this research are**

**Moving average**

**Daily Return**

**Standard deviation of values over past x days**

**Difference between stock price within a day (open, close,high,low)**

**Bollinger bands.**

**Previous price values**

**Exponential moving average**

**Moving Average Convergence Divergence**

**Rate of change in closing price**

**Features from date**

**Auto correlation**

**Holt-winter exponential smoothing**

**Moving Average — MA**

**A moving average (MA) is a widely used indicator in technical analysis that helps smooth out price action by filtering out the “noise” from random price fluctuations. It is nothing but taking average of previous x values and considering the average value as current value. It is a trend-following, or lagging, indicator because it is based on past prices. For this analysis, we have created 3 variables using moving average technique using 10,20 and 50**

***Modeling and Error Analysis.:***

**In this stage our main task is to select the best model. So we trained a multiple models and selected the best one.**

**In this research we tried multiple models**

**Linear regression**

**Ridge Regression**

**KNN**

**Random Forest**

**XgBoost**

**LSTM**

**LINEAR REGRESSION (LR):**

**Linear regression is a simple supervised learning technique. It is nothing but finding the exact linear relationship between dependent and independent variables. LR tries to fit a line that passes through maximum number of points while minimizing the squared distance of the points to the fitted line values.**