Synopsis

Stock Price Prediction

Stocks (or equities) represent a share in the ownership of a company. Owning stock means you hold a portion of the company's assets and earnings proportional to the number of shares you own. Stocks are commonly issued in units called *shares*.

Stock prices fluctuate daily due to market dynamics — primarily governed by supply and demand. When demand (buyers) exceeds supply (sellers), prices rise. Conversely, when more people want to sell a stock than buy it, the price tends to drop.

While the basic principles of supply and demand are easy to grasp, understanding the factors that influence investor sentiment is far more complex. What causes one stock to gain favor while another falls out of favor? News, company performance, market trends, and even global events can all play a role. Every investor often has a unique perspective and strategy for evaluating these factors.

It's important to note that a company's stock price doesn't directly reflect its intrinsic value. The actual value is measured by its market capitalization — calculated by multiplying the share price by the total number of outstanding shares. For instance, a $100 stock with 1 million shares has a market cap of $100 million, whereas a $50 stock with 5 million shares has a market cap of $250 million. Thus, price alone isn't a full indicator of worth. Moreover, stock prices often reflect future expectations rather than just present value.

So why do stock prices change? There's no definite answer. Some argue price movements are unpredictable, while others rely on past trends and chart patterns to make informed decisions. What is certain, however, is that stock prices can be volatile and react quickly to new information.

Understanding the Problem

Before diving into the implementation, it's essential to define our objective. Stock analysis typically falls into two categories:

- **Fundamental Analysis**: Evaluating a company's future potential based on its current financial condition and external environment.

- **Technical Analysis**: Using historical data, charts, and statistical tools to identify patterns and market trends.

This project emphasizes **technical analysis** and stock price **visualization**, specifically focusing on historical Google stock prices.

Implementation Plan

1. Build a machine learning model using Scikit-learn
2. Perform data preprocessing on the historical dataset
3. Visualize stock data trends and patterns
4. Apply feature scaling to normalize inputs
5. Prepare and split the data for training
6. Reshape input datasets to match model requirements
7. Develop a predictive model architecture
8. Implement layers such as Sequential, Dense, LSTM, and Dropout
9. Preprocess input for model predictions
10. Generate predictions on test data
11. Visualize the final results for interpretation.