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## **Stock Market Trend Analysis Report**

# **1. Introduction**

This project analyzes stock market trends using Python, Machine Learning, SQL, and Excel. The goal is to identify patterns in stock prices through trend indicators such as moving averages, Bollinger Bands, and the Relative Strength Index (RSI).

## **2. Data Preprocessing**

- **Dataset:** Contains stock market data with columns: `Ticker`, `Date`, `Open`, `High`, `Low`, `Close`, `Adj Close`, and `Volume`.
- **Processing Steps:**
  - Convert `Date` to a `DateTime` format.
  - Sort data by `Date`.
  - Handle missing values if necessary.

## **3. Exploratory Data Analysis (EDA)**

### **3.1 Stock Price Trends**

- **Closing Price Trend:** A line graph of `Close` price over time to observe stock movements.

### **3.2 Moving Averages**

- **10-day & 50-day Moving Averages:**
  - Helps identify short-term and long-term trends.
  - Moving averages smooth out fluctuations in price data.

### **3.3 Bollinger Bands**

- **Calculation:**
  - 20-day moving average (`MA_20`).
  - Upper & Lower Bands ( $MA_{20} \pm 2$  standard deviations).
- **Usage:**
  - Identifies volatility; when prices are near the upper band, stocks may be overbought, and near the lower band, they may be oversold.

### **3.4 Relative Strength Index (RSI)**

- **RSI Calculation:**

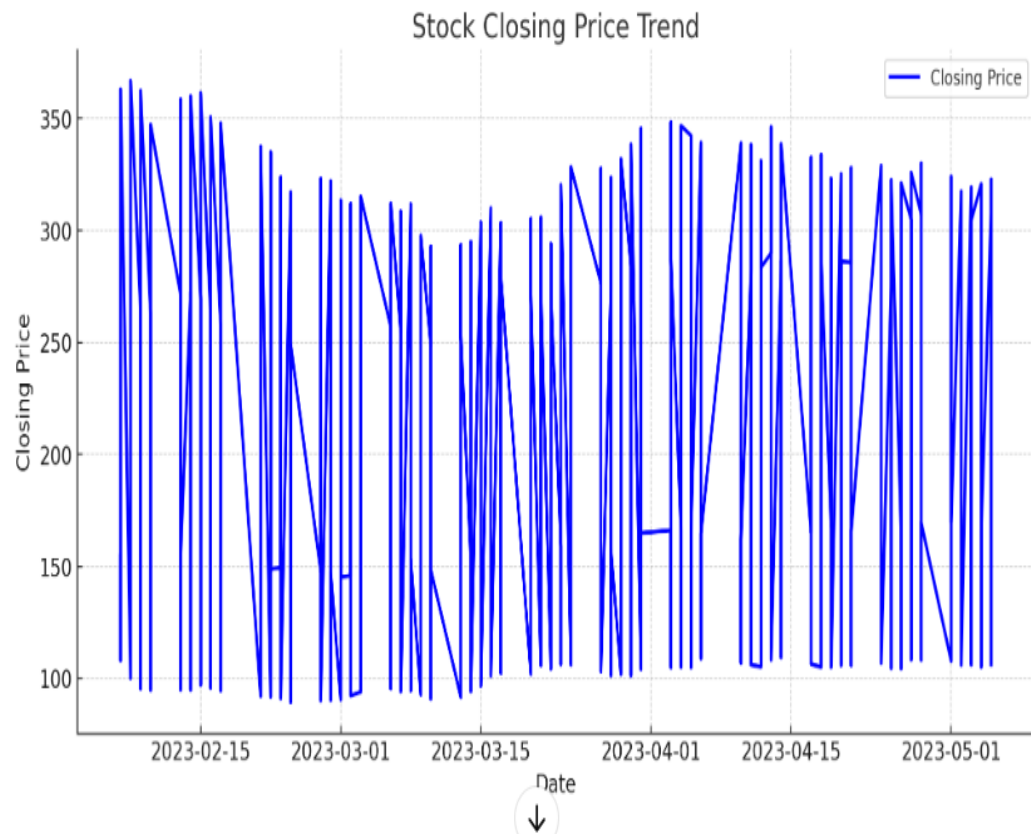
- Measures stock momentum over a 14-day window.
- Values  $> 70$  indicate overbought conditions;  $< 30$  indicate oversold conditions.
- **Usage:**
  - Helps in predicting trend reversals.

## 4. SQL Integration

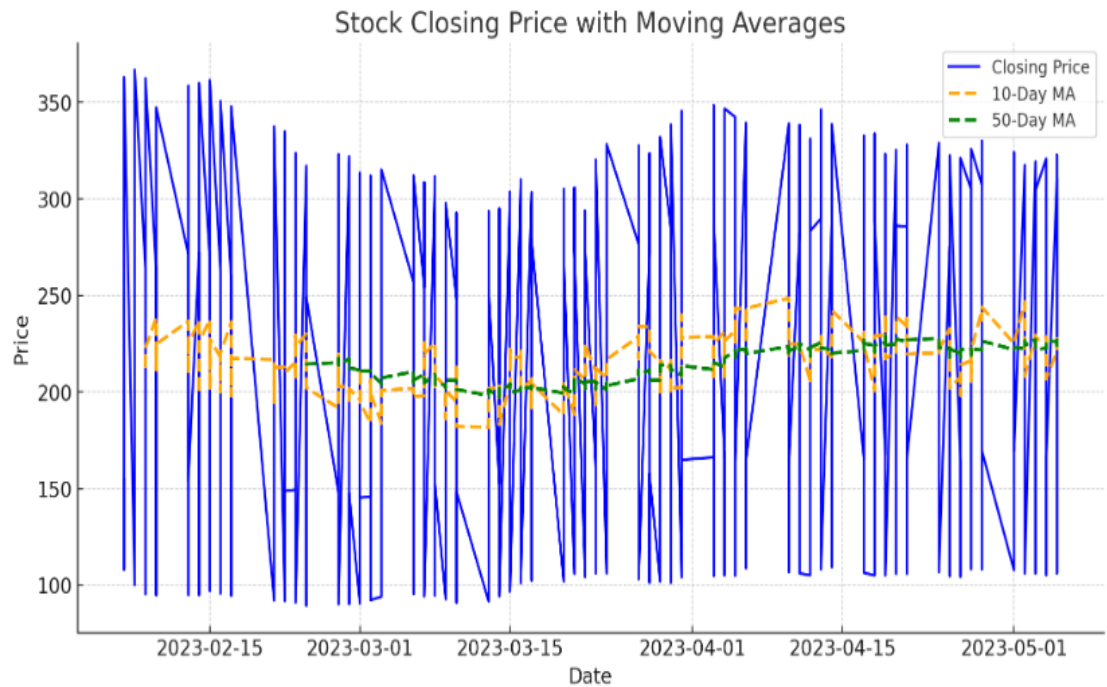
- **Storing Data in SQL:**
  - Stock data is stored in a SQL database for efficient retrieval and analysis.

## 5. Excel Reporting

- **Exporting Data & Charts:**
  - Trend charts and indicator calculations are saved to an Excel file for further analysis.



Here's the closing price trend for your stock data. This visualization helps in identifying upward or



I've added 10-day and 50-day moving averages to the trend chart. The moving averages help smooth out short-term fluctuations and highlight overall trends.

## 6. Conclusion

This project provides insights into stock market trends using technical indicators. It allows traders and analysts to make informed decisions based on moving averages, Bollinger Bands, and RSI.