
Annual review

Contoso

September 24, 20XX

Customer Success Team



Agenda

01 Introduction

02 Data Pre-Processing

03 Visualising Columns

04 Trading Volume

05 Line Plots

06 Correlation Matrix

07 Daily Returns

08 Moving Averages

09 Time Series Decomposition

10 Results

Introduction

Moody's Corporation is a credit rating agency that provides research, analytics, and advisory services to investors, institutions, and governments. Analyzing its stock data can help understand the company's financial performance, risk factors, and market trends.

This report showcases the EDA performed on the historical stock data of Moody's Corporation and serves as a portfolio piece for a data analyst.

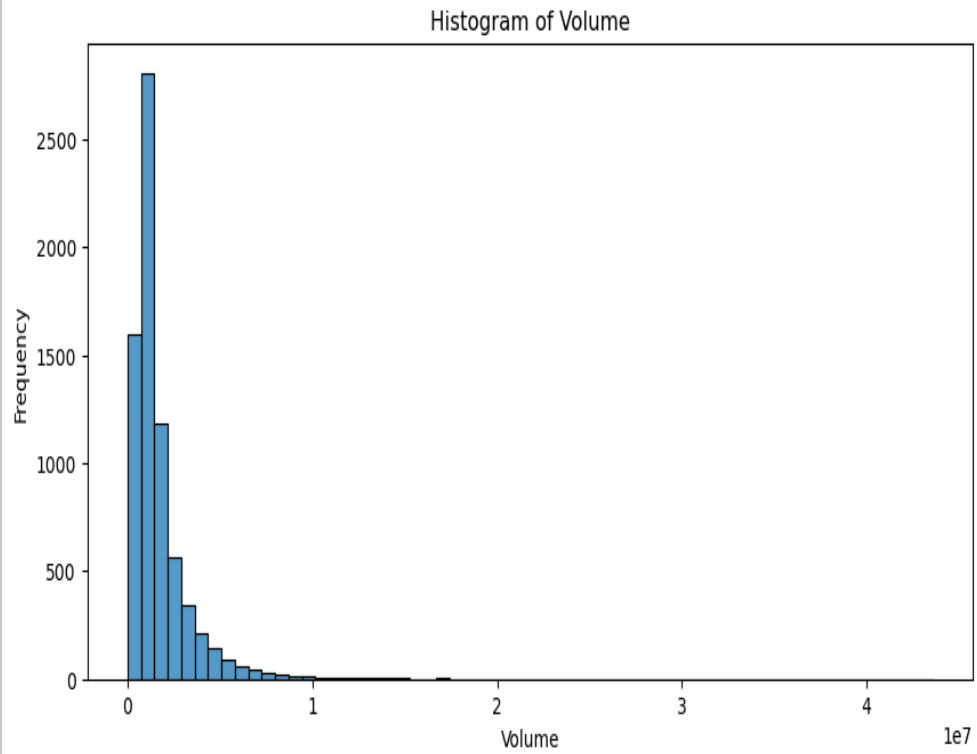


Data Pre-processing

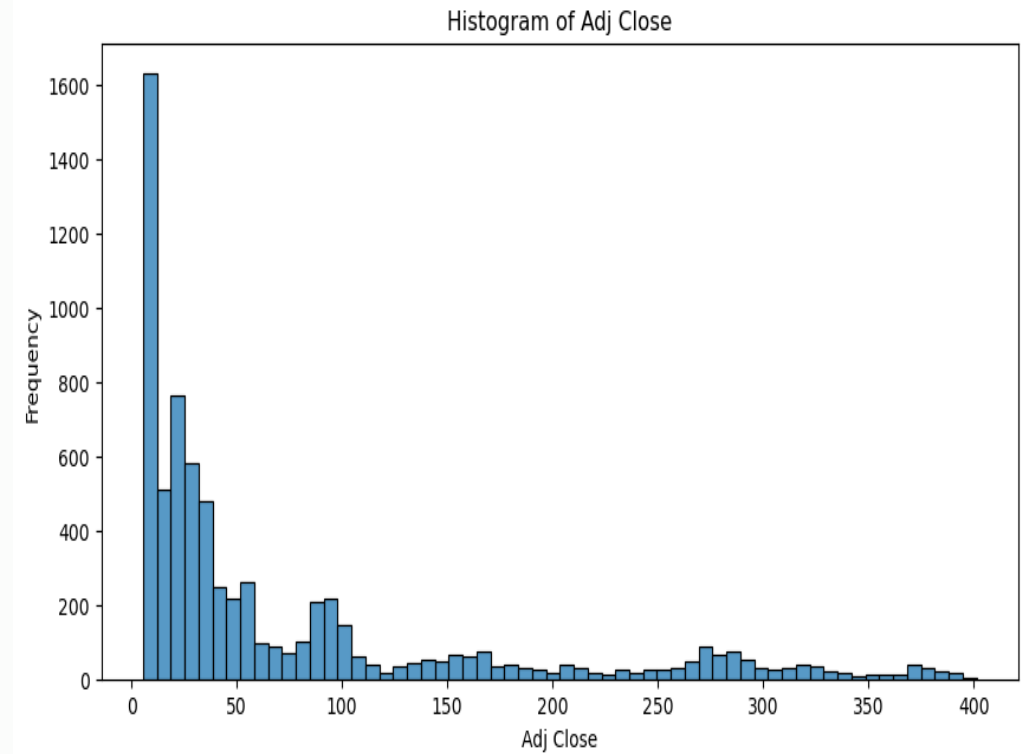
The data preprocessing involved the following steps:

- Reading the CSV file containing the stock data
- Converting the 'Date' column to a **datetime** object and setting it as the index
- Checking for missing values and handling them if necessary
- Extracting day names from the datetime index
- Creating additional features like daily return and moving averages (SMA_50 and SMA_200)

VISUALISING COLUMNS

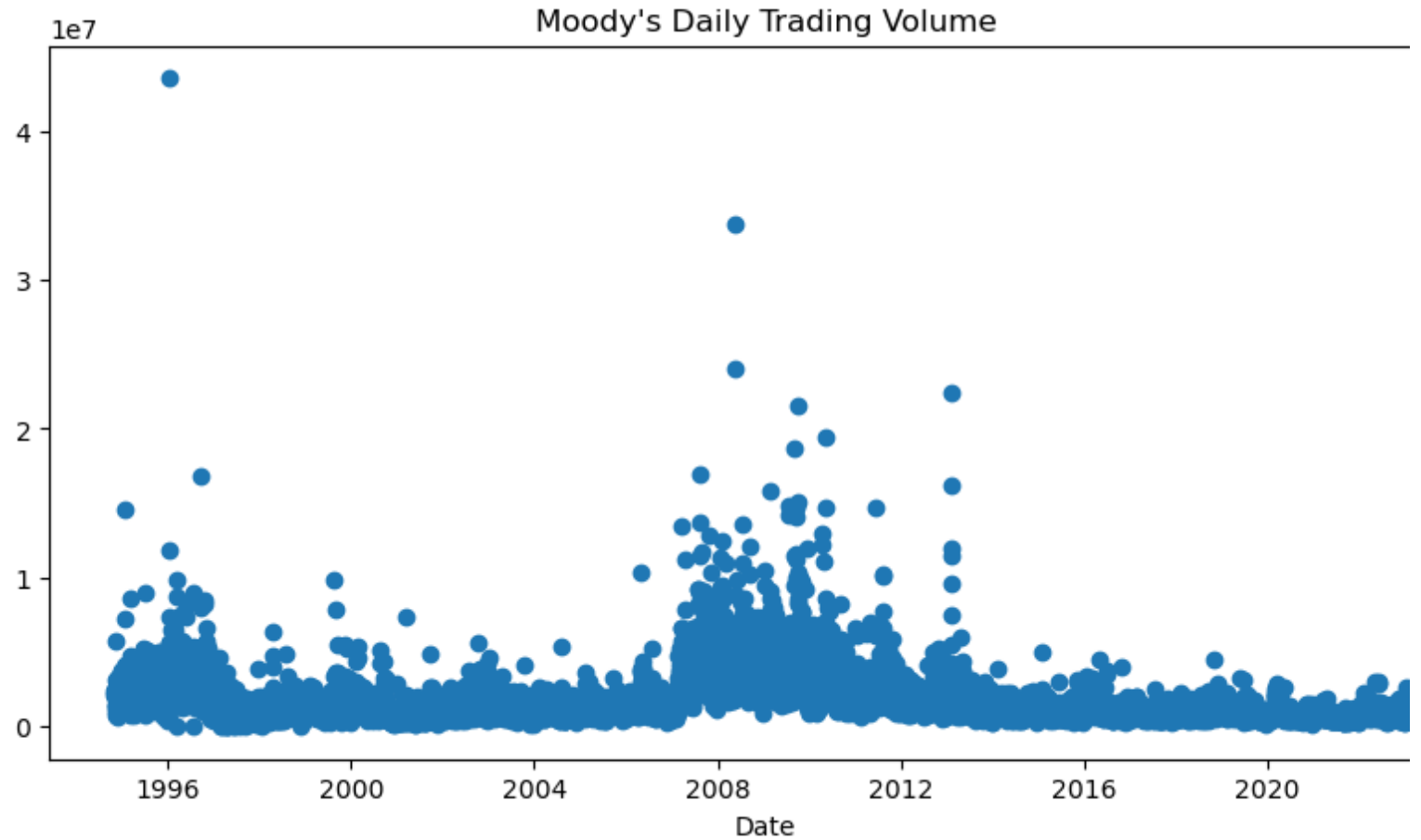


DAILY HIGH

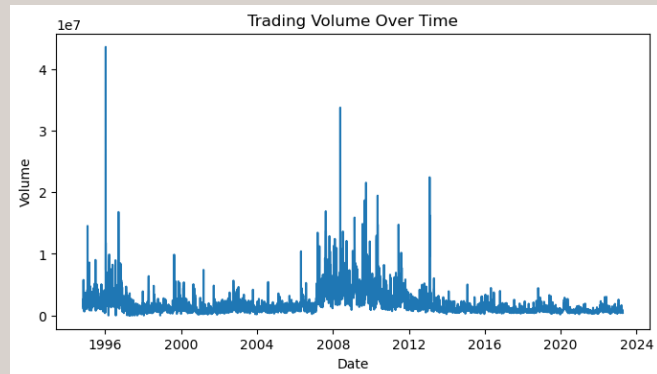


DAILY ADJUSTED CLOSING

Scatter Plot for daily trading volume

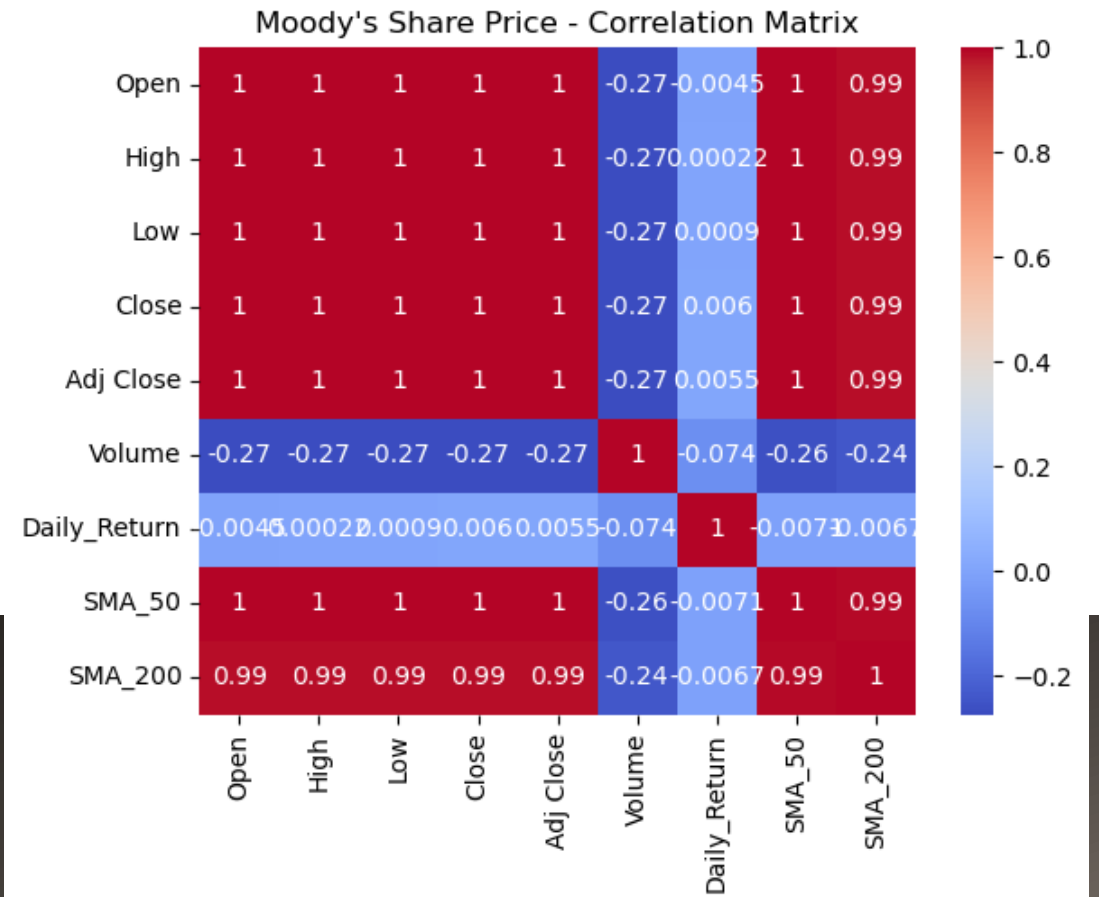


LINE PLOTS

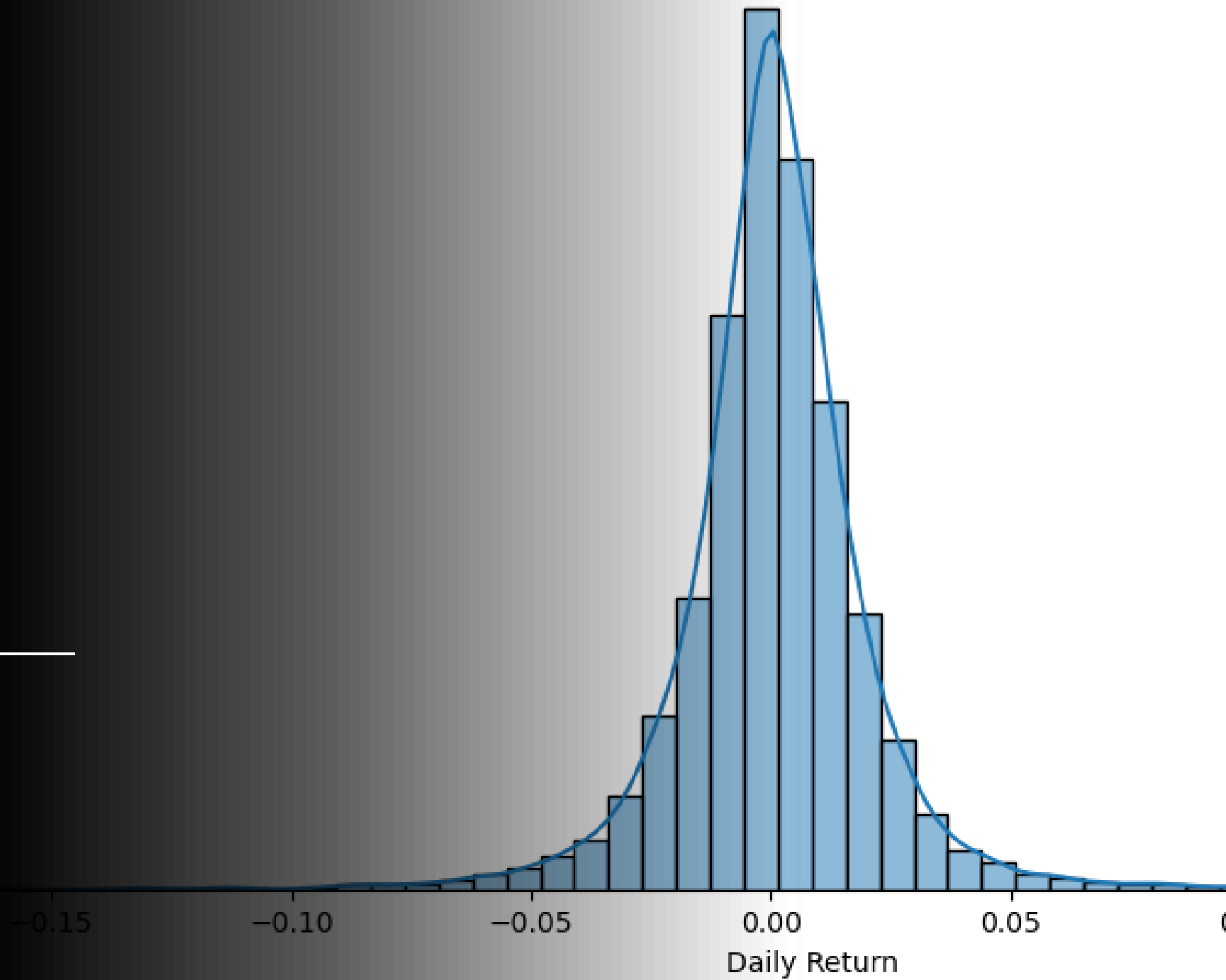


CORRELATION MATRIX

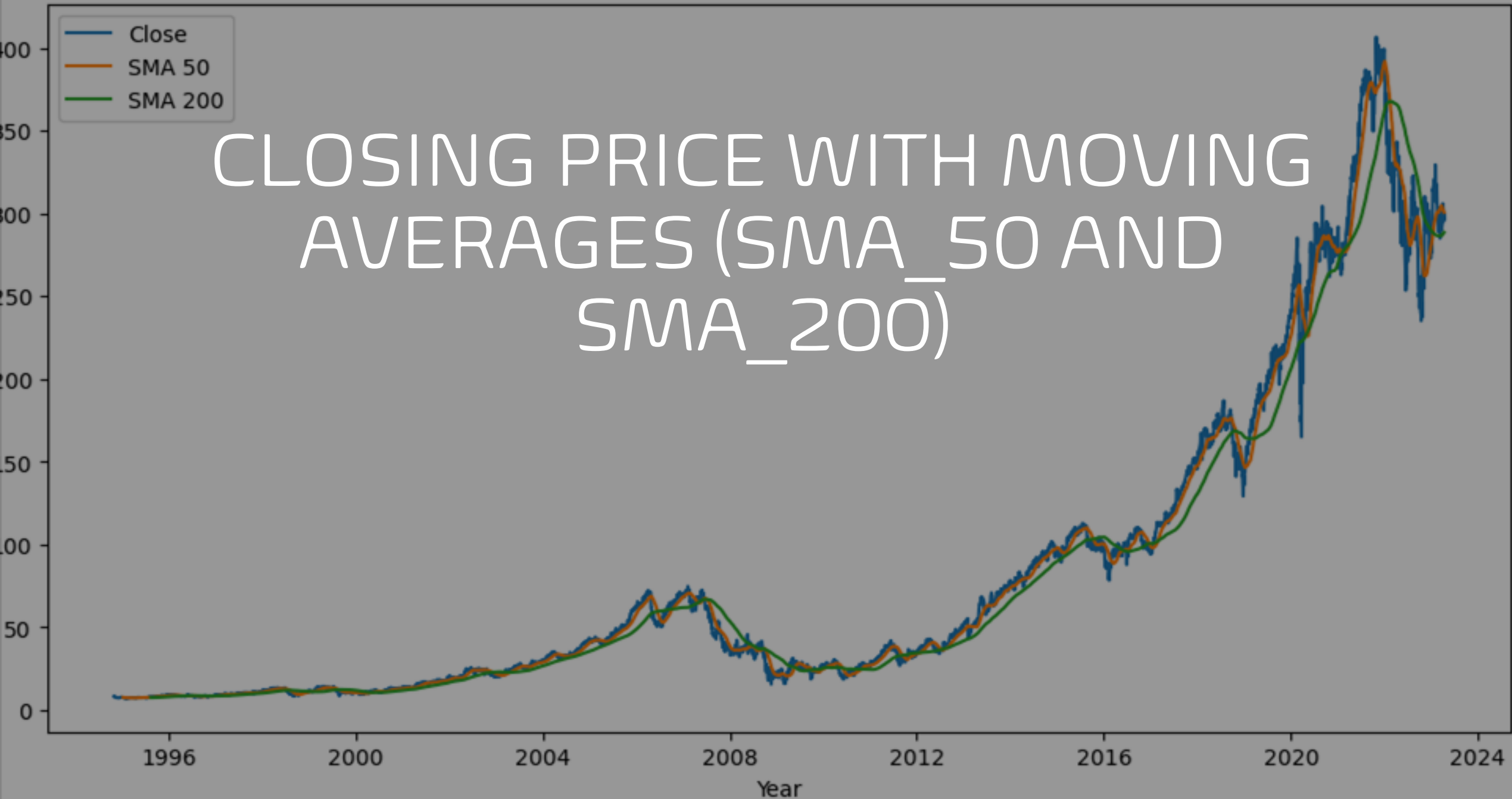
VISUALIZING THE CORRELATION
BETWEEN COLUMNS



DISTIRBUTION
FOR DAILY
RETURNS



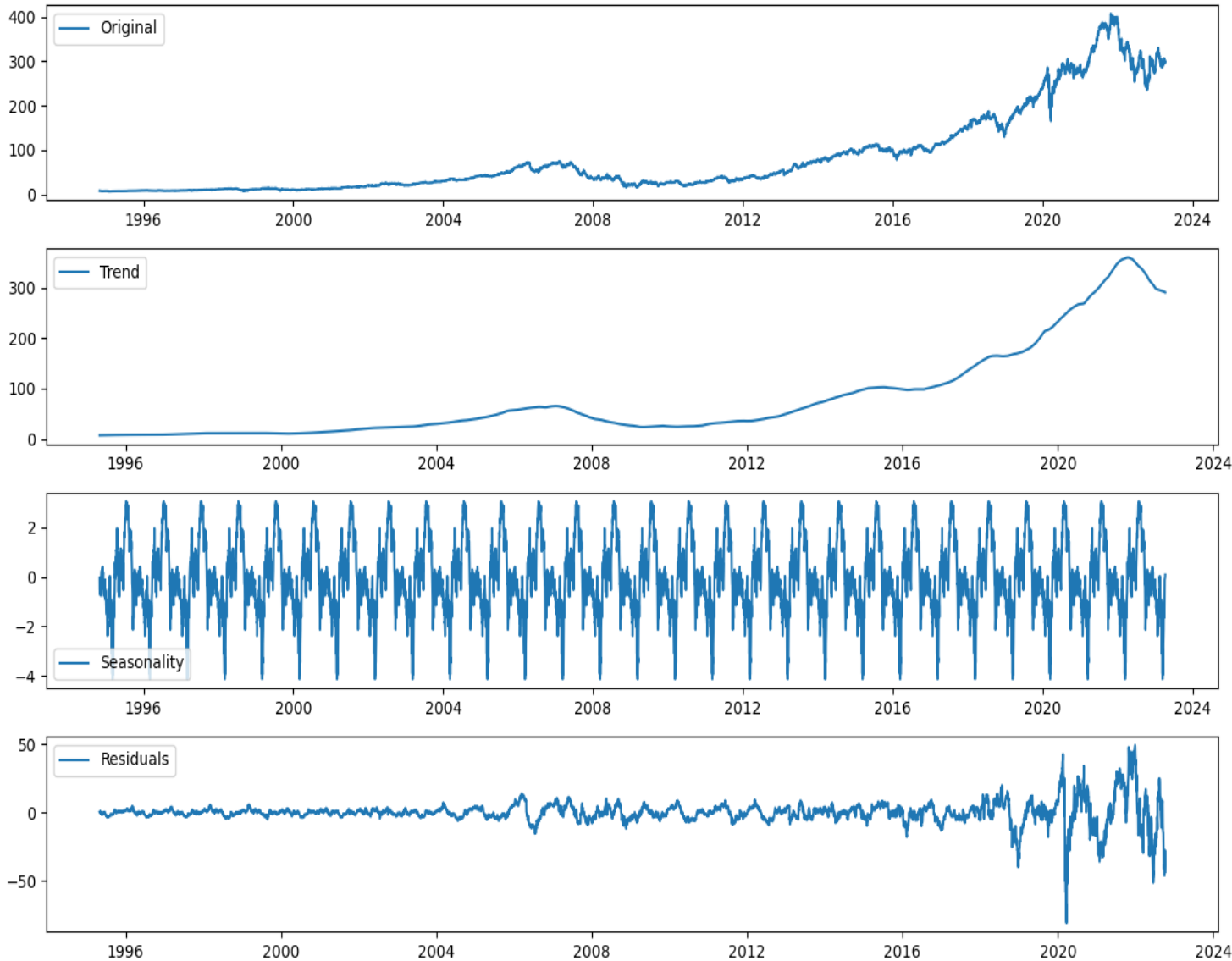
Moody's Closing Price with Moving Averages



Time Series Decomposition

The time series decomposition was performed using the `'seasonal_decompose'` function from the `'statsmodels'` library with an additive model and a period of 252 days (approximate number of trading days in a year). The decomposition resulted in the following components:

- Trend
- Seasonality
- Residuals



Time Series Domposition

Which attributes exhibit correlation, and what is the nature of their relationships?

Observation: In the dataset, the columns 'Open', 'High', 'Low', 'Close', and 'Adj Close' exhibit a strong correlation of 1 with each other, indicating a near-perfect positive relationship. On the other hand, the 'Volume' column has a comparatively weaker correlation of 0.27 with these other columns, suggesting a more limited degree of association between trading volume and the other attributes.

How has the stock liquidity varied over time ?

Stock liquidity is often linked to trading volume. High volumes imply greater liquidity, facilitating easier buying or selling without significant price impacts. In contrast, low volumes suggest lower liquidity and larger price fluctuations. Moody's stock initially had higher trading volumes, which began to decrease over time. The 2007-2011 period was favorable with higher-than-average volumes, indicating enhanced liquidity. However, since 2012, volumes have decreased with yearly fluctuations, suggesting changes in stock liquidity over time.

Summary

How do the short-term (50-day) and long-term (200-day) moving averages relate to the stock price?

The visualization of the closing price with the 50-day (short-term) and 200-day (long-term) moving averages (SMA_50 and SMA_200) offers insights into potential buy or sell signals based on the crossover points of these moving averages. Specifically, when the short-term moving average crosses above the long-term moving average, it may indicate a buying signal, whereas a cross below the long-term moving average may suggest a selling signal. The crossover of these moving averages serves as a strong indication for making investment decisions.

Are there any other identifiable patterns?

The residual plot is primarily flat with minor fluctuations, indicating that trend and seasonality components capture most data structure, leaving random noise as residuals. However, large spikes from 2021 to 2023 suggest unexplained events or factors. These spikes may be due to company-specific events or broader market influences. To understand these spikes, it's recommended to investigate relevant news articles, financial reports, or information sources during that period. This context can help identify contributing factors, providing valuable insights for future analysis and predictions.

Summary

Are there any specific events which need further investigation ?

The scatter plot for trading volume over time reveals several significant spikes, notably one around 1996 and a few more between 2007 and 2011. The period from 2007 to 2011 appears to be favorable for Moody's stock in terms of volume traded, suggesting increased market activity during that time. However, the large spike observed around 1996 could potentially be an outlier and may warrant further investigation and research to better understand the underlying factors or events driving this unusual trading volume.

answer- The dataset mainly indicates an upward trend in the stock prices however there is a significant dip between 2007 to 2011. earlier we noticed that this period was favorable in terms of volume traded. Our correlation matrix also showed a weak correlation of 0.27 with stock prices. If there is a large volume of shares being bought or sold, it could indicate that institutional investors are accumulating or distributing shares. Accumulation typically leads to an increase in