Data-Driven Stock Analysis: Organizing, Cleaning, and Visualizing Market Trends:

The Stock Performance Dashboard aims to provide a comprehensive visualization and analysis of the Nifty 50 stocks' performance over the past year. The project will analyse daily stock data, including open, close, and high, low, and volume values. Clean and process the data, generate key performance insights, and visualize the top-performing stocks in terms of price changes, as well as average stock metrics. The solution will offer interactive dashboards using Streamlit and Power BI to help Investors, analysts, and enthusiasts make informed decisions based on the stock performance trends.

Data Analysis and Visualization:

1. **Volatility Analysis:** Visualize the volatility of each stock over the past year by calculating the standard deviation of daily returns. A bar chat shows Top 10 Most Volatile Stocks.
2. **Cumulative Return over Time:** Show the cumulative return of each stock from the beginning of the year to the end. A line chart shows Cumulative Return for Top 5 Performing Stocks.
3. **Sector-wise Performance:** Provide a breakdown of stock performance by sector. A bar chart shows Average Yearly Return by Sector.
4. **Stock Price Correlation:** Heat map of the correlation matrix to visualize the correlation between the stock prices of different companies.
5. **Top 5 Gainers and Losers (Month-wise**): Provide monthly breakdowns of the top-performing and worst-performing stocks. A set of 12 bar charts for each month showing the top 5 gainers and losers.

Code Explanation:

Source code contains two files named us stock analysis.ipynb and streamlitt.py. Stock analysis file spitted into eight code snippets.

1. First code snippet convert given source yaml data to csv file.
2. Second code snippet separate csv files based on company name.
3. Third code snippet shows Top 10 Most Volatile Stocks from November 2023 - November 2024.
4. Fourth code snippet shows Cumulative Returns of Top 5 Performing Stocks from November 2023 - November 2024
5. Fifth code snippet shows Sector-wise Performance from November 2023 - November 2024.
6. Sixth code snippet shows Stock Returns Correlation Matrix from November 2023 - November 2024.
7. Seventh code snippet shows Monthly Top 5 Gainers and Losers from November 2023 - November 2024.
8. Eighth code snippet Import csv files and store it in a mysql database.

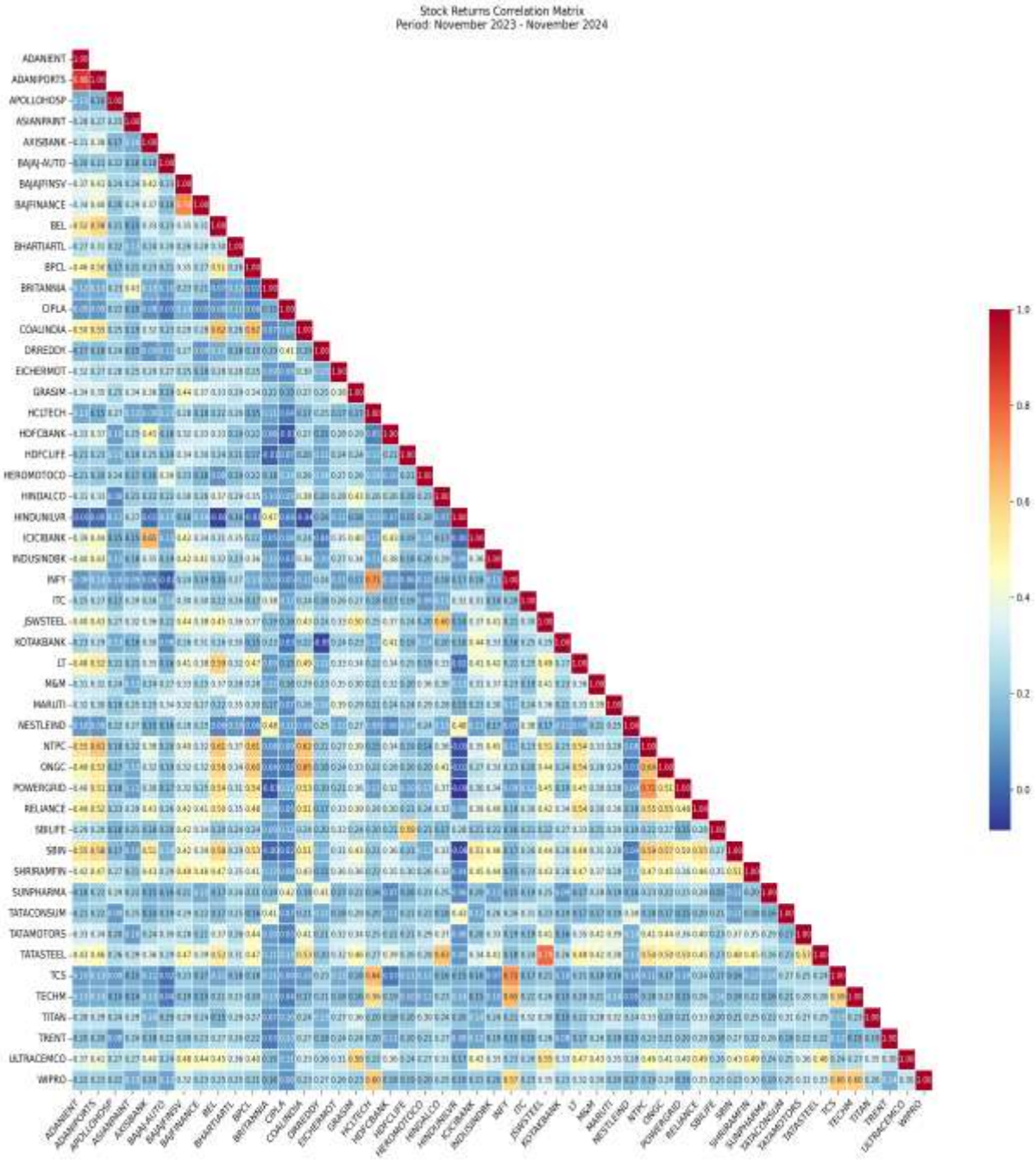
Streamlitt file fetch data from sql database and display five charts.

Results:

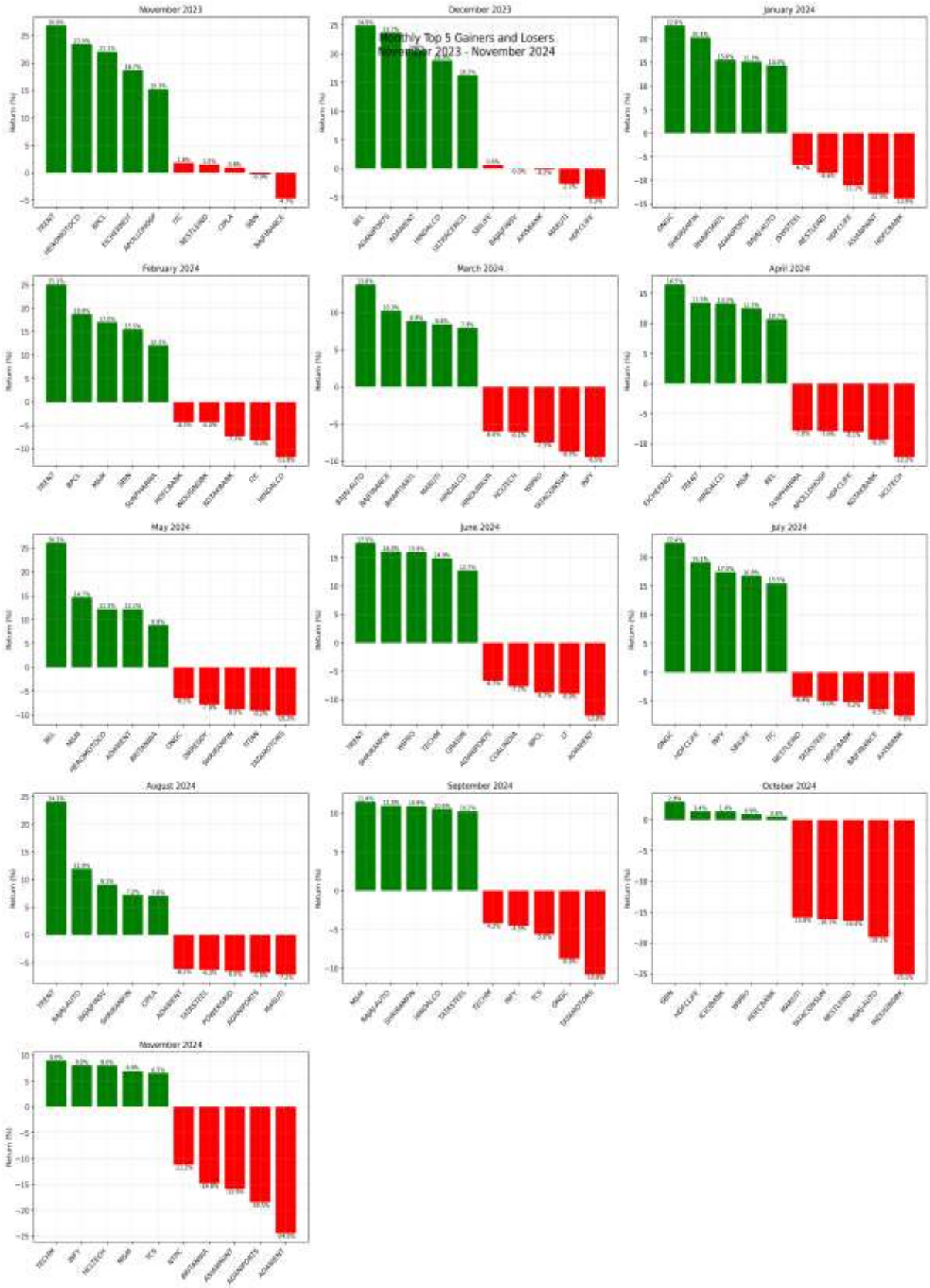
1. A fully functional dashboard showing the top-performing and worst-performing stocks over the last year.
2. Insights on the overall market with clear indicators of stock performance trends.
3. Interactive visualizations using Power BI and Streamlit to make the data easily accessible for users.

Screenshots:

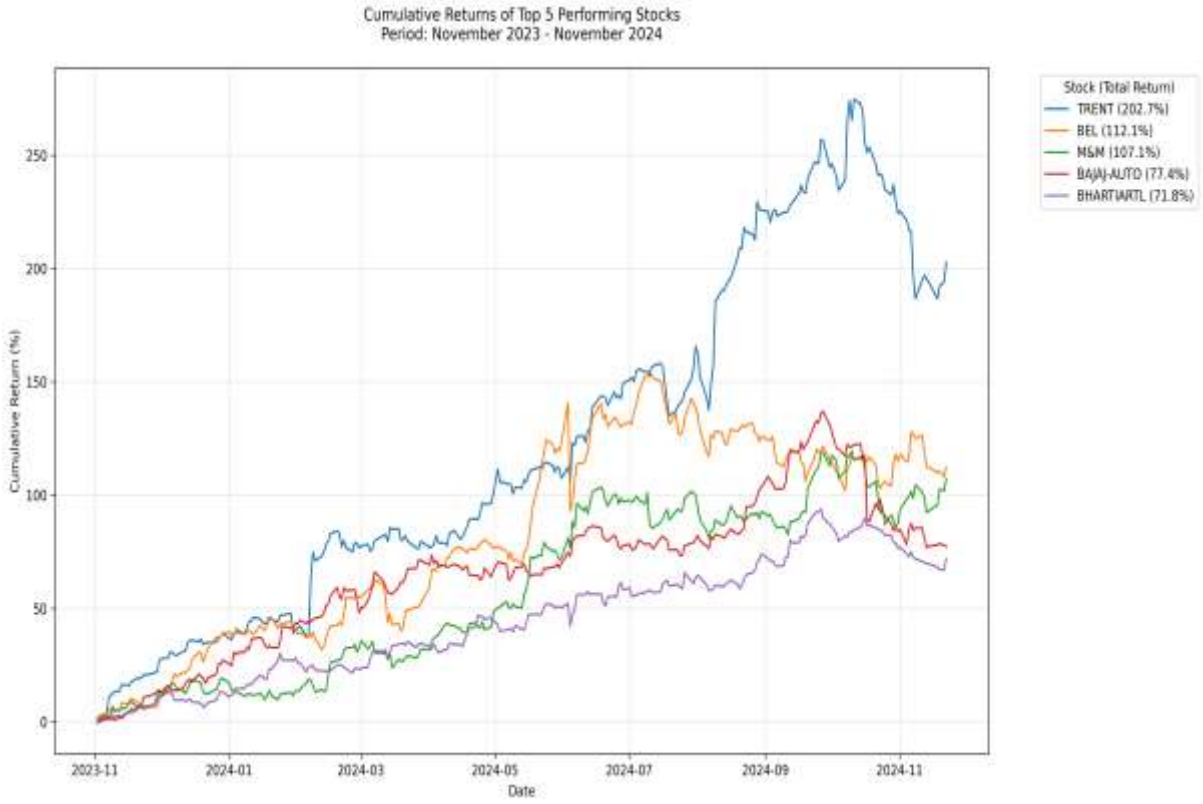
Correlation heat map:



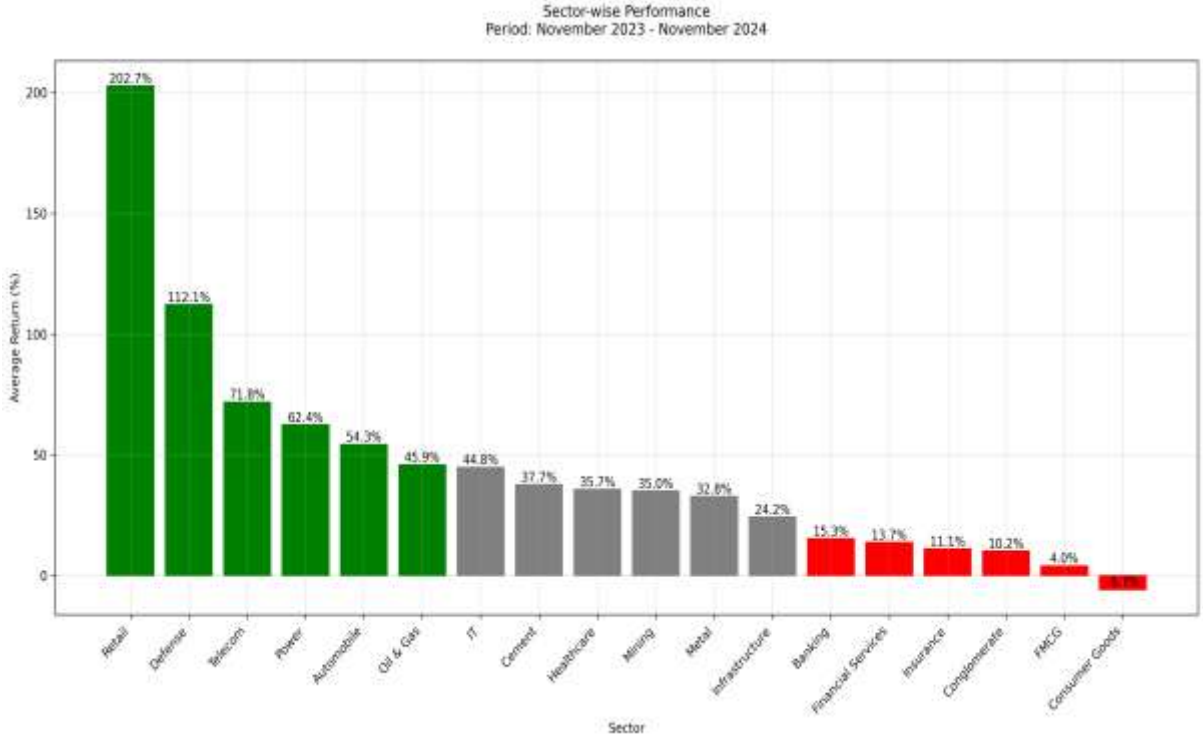
Monthly Performance:



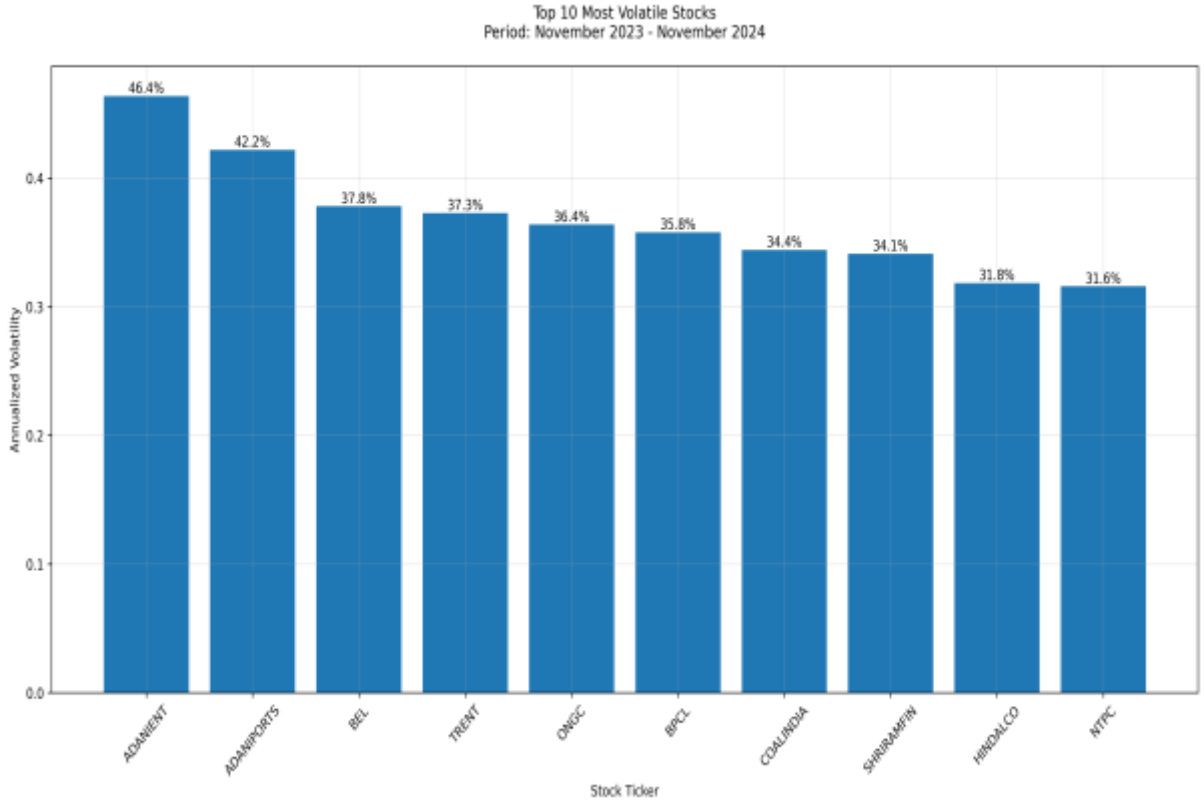
Top 5 cumulative returns:



Sector analysis:



Volatility analysis:



SQL Database Schema:

```
mysql> use stock_analysis;
Database changed
mysql> show tables;
+----------------------------+
| Tables_in_stock_analysis |
+----------------------------+
| correlation_analysis       |
| cumulative_returns_daily |
| monthly_performance        |
| sector_performance         |
| volatility_analysis        |
+----------------------------+
5 rows in set (0.11 sec)
```

```
mysql> desc correlation_analysis;
+-------------+-------------+------+-----+---------+-------+
| Field       | Type        | Null | Key | Default | Extra |
+-------------+-------------+------+-----+---------+-------+
| Stock_A     | varchar(20) | NO   | PRI | NULL    |       |
| Stock_B     | varchar(20) | NO   | PRI | NULL    |       |
| Correlation | double      | YES  |     | NULL    |       |
+-------------+-------------+------+-----+---------+-------+
3 rows in set (0.10 sec)
```

```
mysql> desc  cumulative_returns_daily;
+------------------+-------------+------+-----+---------+-------+
| Field            | Type        | Null | Key | Default | Extra |
+------------------+-------------+------+-----+---------+-------+
| Trading_Date     | date        | NO   | PRI | NULL    |       |
| Ticker           | varchar(20) | NO   | PRI | NULL    |       |
| Close_Price      | float       | YES  |     | NULL    |       |
| Daily_Return     | float       | YES  |     | NULL    |       |
| Cumulative_Return | float      | YES  |     | NULL    |       |
+------------------+-------------+------+-----+---------+-------+
5 rows in set (0.01 sec)
```

```
mysql> desc   monthly_performance;
+---------------+-------------+------+-----+---------+-------+
| Field         | Type        | Null | Key | Default | Extra |
+---------------+-------------+------+-----+---------+-------+
| Month_Date    | date        | NO   | PRI | NULL    |       |
| Category      | varchar(20) | NO   | PRI | NULL    |       |
| Ranking       | int         | NO   | PRI | NULL    |       |
| Ticker        | varchar(20) | YES  |     | NULL    |       |
| Monthly_Return | float      | YES  |     | NULL    |       |
+---------------+-------------+------+-----+---------+-------+
5 rows in set (0.01 sec)
```

```
mysql> desc sector_performance;
+--------------------+-------------+------+-----+---------+-------+
| Field              | Type        | Null | Key | Default | Extra |
+--------------------+-------------+------+-----+---------+-------+
| Sector             | varchar(50) | NO   | PRI | NULL    |       |
| Average_Return     | float       | YES  |     | NULL    |       |
| Number_of_Stocks   | int         | YES  |     | NULL    |       |
| Performance_Ranking | int        | YES  |     | NULL    |       |
+--------------------+-------------+------+-----+---------+-------+
4 rows in set (0.00 sec)
```

```
mysql> desc volatility_analysis;
+----------------------+-------------+------+-----+---------+-------+
| Field                | Type        | Null | Key | Default | Extra |
+----------------------+-------------+------+-----+---------+-------+
| Ticker               | varchar(20) | NO   | PRI | NULL    |       |
| Daily_StdDev         | float       | YES  |     | NULL    |       |
| Annualized_Volatility | float      | YES  |     | NULL    |       |
| Risk_Category        | varchar(20) | YES  |     | NULL    |       |
+----------------------+-------------+------+-----+---------+-------+
4 rows in set (0.00 sec)
```