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

Data-Driven Stock Analysis Project

The Stock Performance Dashboard aims to provide a comprehensive visualization and analysis of the Nifty 50 stocks' performance over the past year.

Project Overview

This project consists of four main components:

1. Data extraction from Yaml format and transform into csv file

2. Data Analysis and visualization need to be done to filter the stocks based on their perfomance

3. Streamlit dashboard will show the top-perfoming and worst-performing stocks for the year

4. Powerbi dashboard will show the clear visualization to make the data easily accessible for users.

Features

- **Interactive Filters**: Time period, sectors, individual stocks
- **Technical Analysis:** RSI (Relative Strength Index) MACD (Moving Average Convergence Divergence) Bollinger Bands
- **Comparative Analysis:** Correlation matrix Performance heatmaps Risk-return scatter plots

Technologies Used

- Python 3.x

- Pandas (Data processing)

- PowerBi (Dashboard)

- Streamlit (Dashboard)

- Matplotlib/Seaborn (Visualization)

Run a code

1. Data extraction
Run the scraping script:
python convert.py
This will convert yaml data into csv files.

2. Combine and Clean Data
python combine.py
Creates combined_cleaned_file.csv with all stocks

3. Launch Dashboard
streamlit run stream.py
Access the interactive dashboard at http://localhost:8501

4. Launch Dashboard
Attached the powerbi dashboard file.

Dashboard Features

1. **Interactive Stock Explorer** Multi-ticker comparison: Overlay up to 5 stocks on price charts Timeframe selector: Daily/Weekly/Monthly views (1M/3M/1Y/5Y) Sector filter: Isolate stocks by industry (Tech/Finance/Healthcare)

2. **Technical Analysis Toolkit** Indicator toggles: ✅ 50-day & 200-day Moving Averages ✅ Bollinger Bands ($\pm 2\sigma$) ✅ RSI with overbought(70)/oversold(30) markers ✅ MACD histogram + signal line crossover alerts

3. **Market Intelligence** Heatmaps: 🔥 Real-time sector performance 🔥 Stock correlation matrix

‹ Back to report   **SUM OF CLOSE**   BY YEAR, QUARTER, MONTH, DAY, SECTOR AND SYMBOL

Sector ● ALUMIN... ● AUTOM... ● BANKING ● CEMENT ● DEFENCE ● ENERGY ● ENGINE... ● FINANCE ● FMCG ● FOOD ... ● INSURA... ● MINING ▶

ADANIENT

ADANIENT
2024 Qtr 3 July 12
● Unknown   3,065.45

Sum of close — 10K, 5K, 0K

ADANIPORTS

APOLLOHOSP

Sum of close — 10K, 5K, 0K

Jan 2024   Apr 2024   Jul 2024   Oct 2024
Year Quarter Month Day

ASIANPAINT

Jan 2024   Apr 2024   Jul 2024   Oct 2024
Year Quarter Month Day

🔍 Search

Filters on this visual   ...

Date - Day
is (All)

Date - Month
is (All)

Date - Quarter
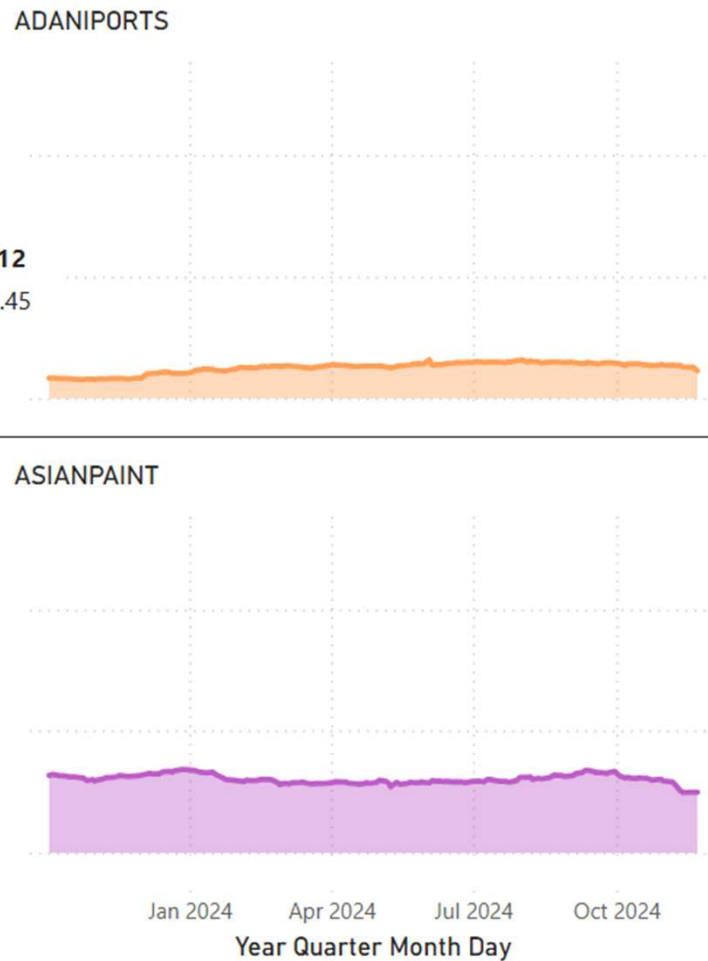is (All)

Date - Year
is (All)

Sector
is (All)
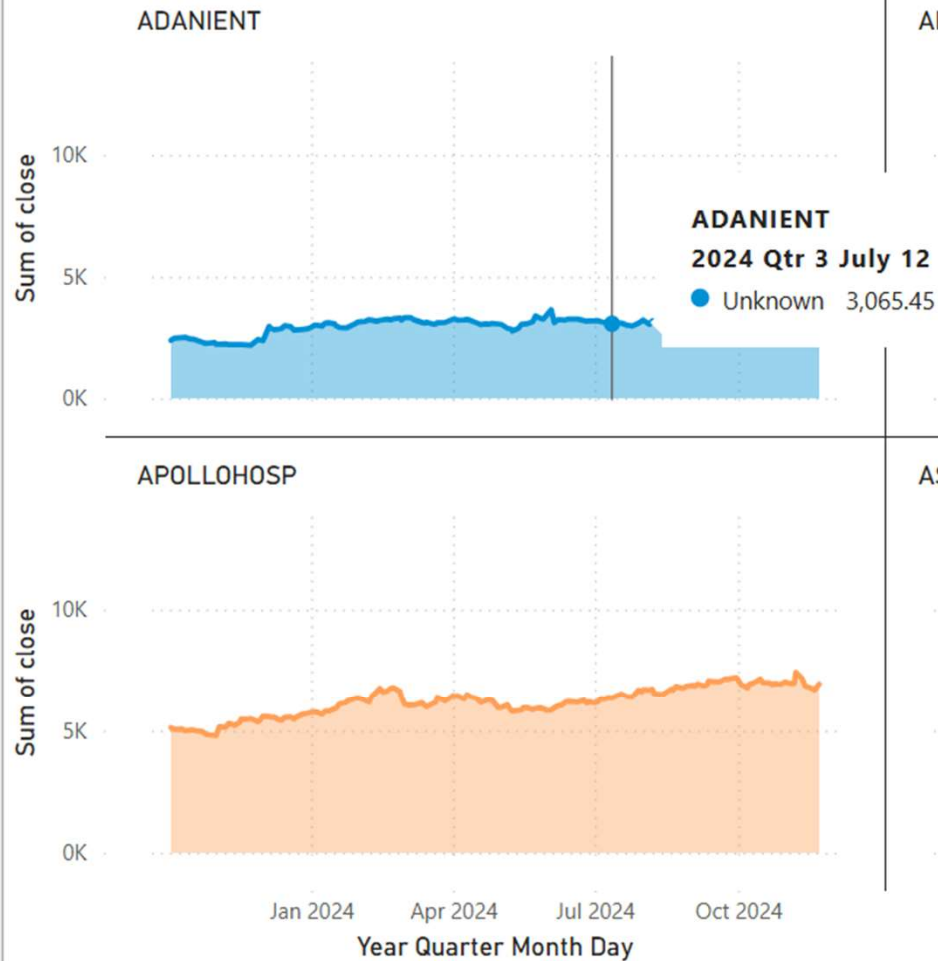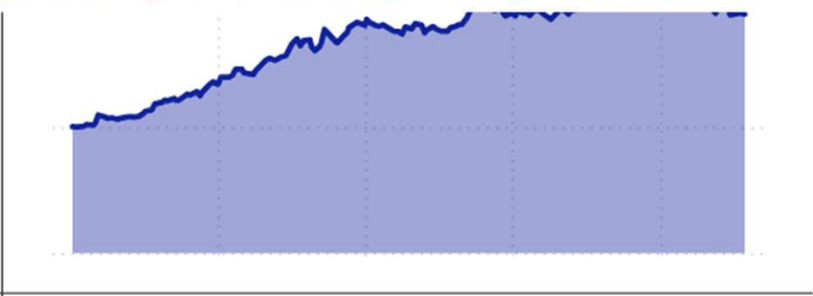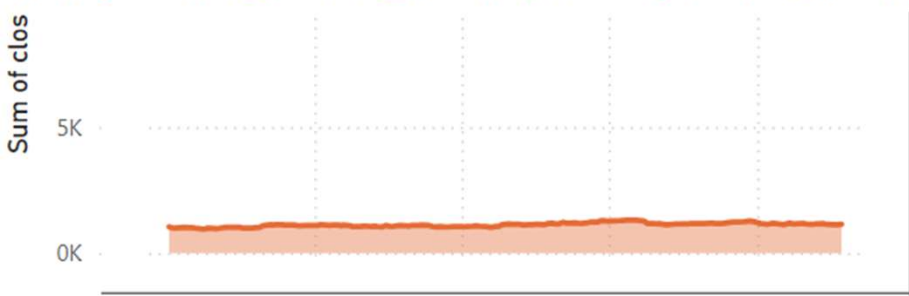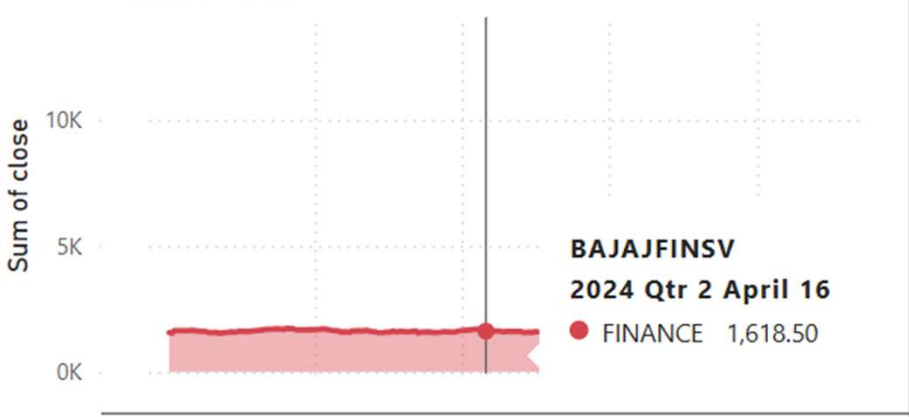
Sum of close
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Symbol
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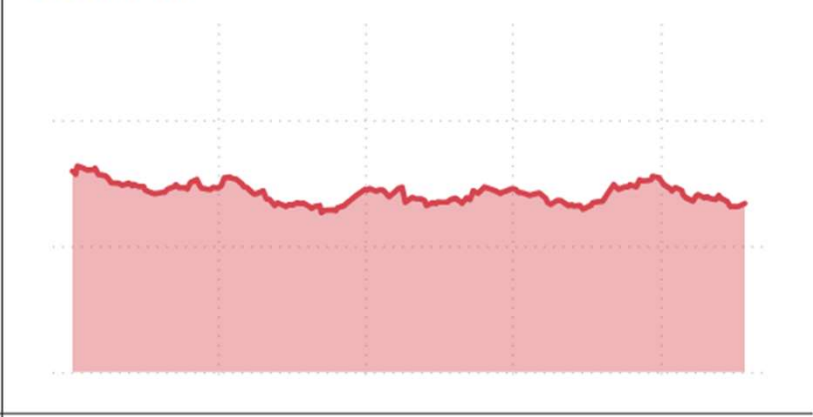
Sector   ●ALUMIN...   ●AUTOM...   ●BANKING   ●CEMENT   ●DEFENCE   ●ENERGY   ●ENGINE...   ●FINANCE   ●FMCG   ●FOOD ...   ●INSURA...   ●MINING ▶

BAJAJFINSV

BAJFINANCE

BAJAJFINSV
2024 Qtr 2 April 16
● FINANCE   1,618.50
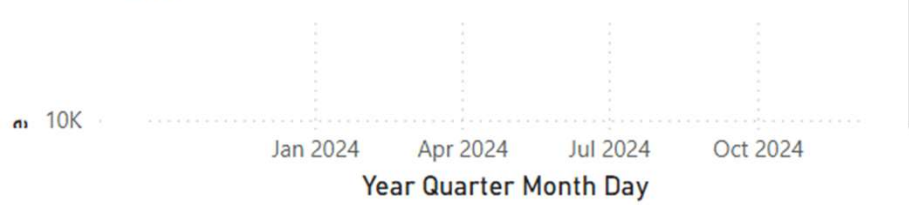
BEL

BHARTIARTL

Year Quarter Month Day   Year Quarter Month Day

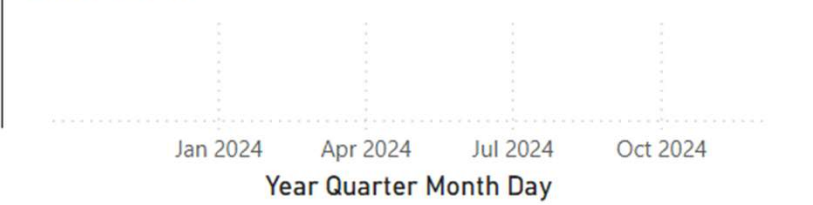**Search**

Filters on this visual   ...

Date - Day
is (All)

Date - Month
is (All)

Date - Quarter
is (All)

Date - Year
is (All)

Sector
is (All)

Sum of close
is (All)

Symbol
is (All)

Add data fields here

📊 Nifty 50 Stock Market Dashboard

Interactive Visual Analytics for Informed Investing Decisions

📈 Market Overview   🏆 Top Performers   📊 Sector Performance   ⚡ Volatility   📊 Correlation   📉 Cumulative Returns

Market Overview

📦 Total Stocks

50

🟢 Green Stocks

45

🔴 Red Stocks

5

Top Performers

Top 10 Gainers

	Yearly Return
TRENT	223.09%
BEL	101.76%
M&M	95.98%
BAJAJ-AUTO	89.01%
BHARTIARTL	69.60%
POWERGRID	68.85%
BPCL	67.48%
HEROMOTOCO	58.98%
SUNPHARMA	57.28%
HCLTECH	53.26%

Top 10 Losers

	Yearly Return
INDUSINDBK	-30.46%
ASIANPAINT	-21.94%
BAJFINANCE	-16.11%
ADANIENT	-6.67%
HINDUNILVR	-0.96%
NESTLEIND	0.71%
KOTAKBANK	1.99%
BAJAJFINSV	2.55%
TITAN	3.52%
MARUTI	6.93%

Sector-wise Performance 🔗

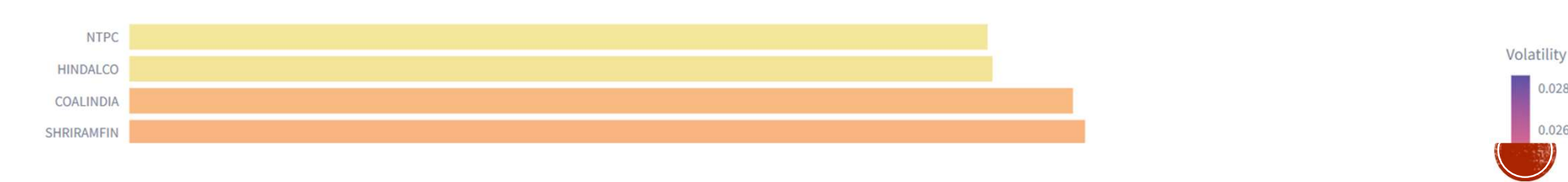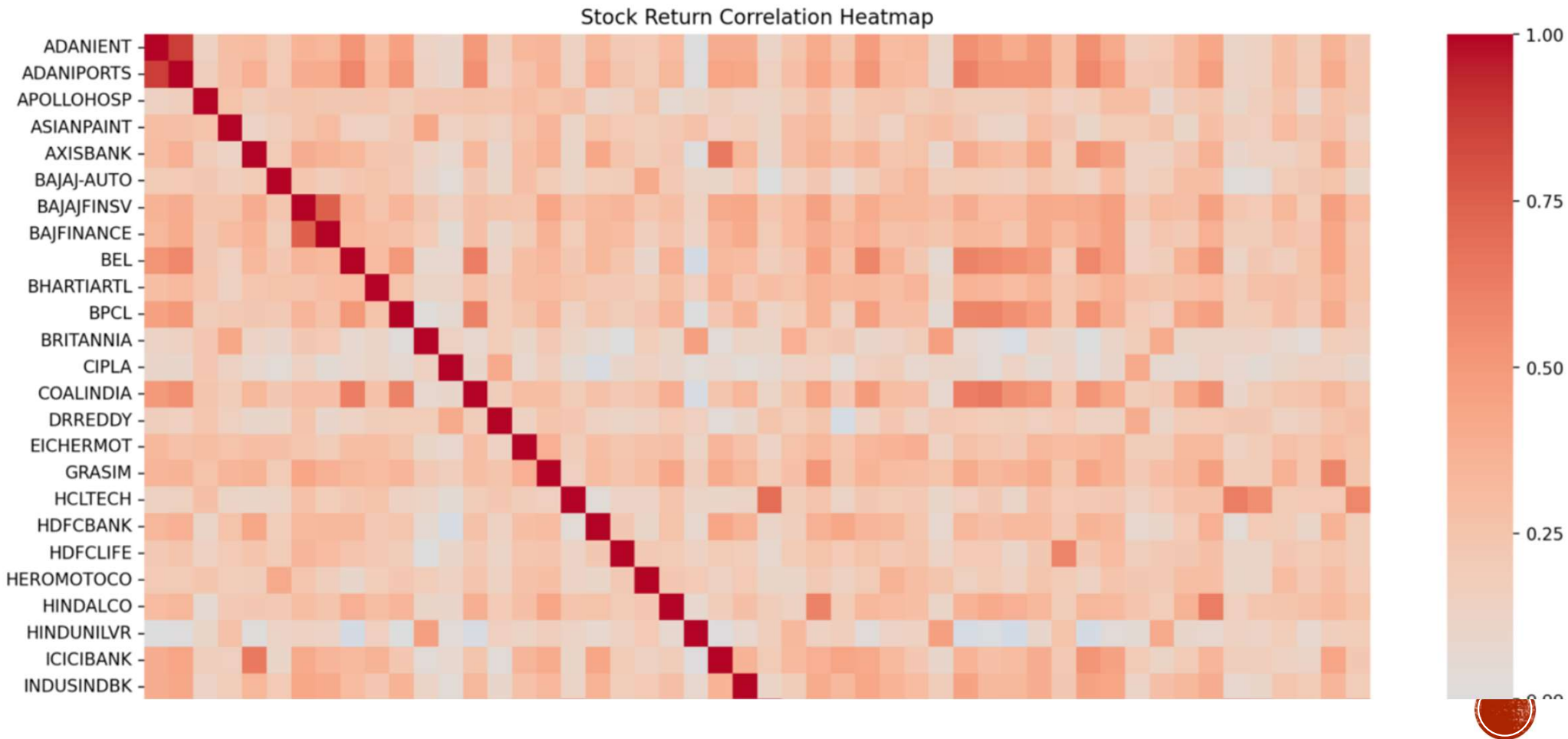|	Avg Return
None	20.13%
MISCELLANEOUS	36.10%
PAINTS	-21.94%
BANKING	11.38%
AUTOMOBILES	54.53%
FINANCE	11.58%
DEFENCE	101.76%
ENERGY	36.56%
PHARMACEUTICALS	31.38%
MINING	41.85%

Average Yearly Return by Sector

Volatility Analysis 🔗

	Volatility
ADANIENT	0.0286
ADANIPORTS	0.0260
BEL	0.0233
TRENT	0.0231
ONGC	0.0222
BPCL	0.0221
SHRIRAMFIN	0.0217
COALINDIA	0.0214
HINDALCO	0.0196
NTPC	0.0195

Top 10 Most Volatile Stocks

Volatility
0.028
0.026

Stock Correlation Matrix

Stock Return Correlation Heatmap

Cumulative Returns Over Time 🔗

Cumulative Returns for Top 5 Performing Stocks

Legend: TRENT, BEL, M&M, BAJAJ-AUTO, BHARTIARTL