Stock Price and Revenue Data Analysis: Tesla & GameStop

Executive Summary

This Python project analyzes and visualizes the **historical stock prices** and **quarterly revenues** for Tesla, Inc. (TSLA) and GameStop Corp. (GME). Using yFinance and web scraping, it uncovers trends in financial performance, providing insights into how these companies' stock prices relate to their revenue changes over time.

Project Objectives

- Extract and clean long-term stock and revenue data for Tesla and GameStop.
- Create interactive, dual-panel charts to show the relationship between stock price movements and quarterly revenue.
- Identify key growth, volatility, or divergence periods in each company's performance.

Technologies & Tools Used

- **Python** (pandas, requests, BeautifulSoup, yfinance)
- **Visualization:** plotly for interactive multi-panel charts
- **Data Sources:** Yahoo Finance, company financials via web scraping

Dataset Description

Data Source	Fields Extracted
Yahoo Finance (yFinance)	Date, Open, High, Low, Close, Volume, Stock Splits/Dividends (daily)
Company Financial Webpages	Date, Quarterly Revenue (manual/scraped)

Methodology

1. **Data Extraction:**
    - Pulled daily stock price history for each company using yFinance's Ticker API.
    - Scraped quarterly revenue data from each company's web page (in this notebook, handled with BeautifulSoup parsing).
2. **Data Cleaning:**
    - Reset indexes, filtered on valid dates, and dropped missing values.
    - Converted date fields to datetime objects to align stock and revenue data chronologically.
3. **Visualization:**
    - Created dual-panel Plotly charts showing (top) historical share price and (bottom) historical revenue for Tesla and GameStop.
    - Synced x-axes for parallel trend observation and set custom axis labels.

Key Technical Snippet

```
def make_graph(stock_data, revenue_data, stock):
    # Creates a dual-panel interactive chart for price & revenue
    fig = make_subplots(rows=2, cols=1, shared_xaxes=True,
        subplot_titles=("Historical Share Price", "Historical Revenue"),
vertical_spacing=.3)
    # Upper: Share Price
    # Lower: Revenue
    ...
    fig.show()
```

See notebook for full function and source code.

Results & Insights

Tesla (TSLA)

- **Stock Explosion:** Share price surged from <$20 (pre-2019) to over $800 (2020–2021 split-adjusted), closely mirroring the surge in quarterly revenue as Tesla ramped production and EV sales.
- **Revenue Growth:** Revenues, initially modest, saw dramatic upticks from 2020 onward, coinciding with global EV adoption and S&P 500 inclusion.
- **Market Events:** Large price spikes align with product launches, quarterly earnings beats, and broader tech bull runs.

GameStop (GME)

- **Stock Volatility:** Major price spike in early 2021 (meme-stock event) not matched by revenue growth—stock price unlinked from immediate financial fundamentals.
- **Revenue Stagnation:** Quarterly revenues generally declined through the late 2010s, with only moderate improvements thereafter.
- **Key Insight:** GME shows a clear divergence between "market narrative/speculation" and underlying financial performance.

Visuals

(Notebook contains plotly interactive charts for each company, not included here. Export screenshots should be in the README and PDF report for maximum recruiter appeal.)

Limitations & Challenges

Challenge	Solution / Approach
Web scraping reliability	Used flexible parsing and manual validation
Data alignment	Filtered dates and handled missing financial records
Visual storytelling	Interactive charting with synchronized axes

Conclusion

This project clearly demonstrates the importance of comparing **stock performance with actual business fundamentals**. While Tesla's stock price followed its strong revenue growth, GameStop's stock price narrative was driven much more by market sentiment.

Skills demonstrated include:

- Web data extraction (API + scraping)
- Data wrangling and cleaning
- Interactive visualization and trend communication

Next Steps

- Automate the scraping for more companies or longer time periods.
- Add more financial metrics: EBITDA, Net Income, EPS.
- Extend to predictive modeling or news/event annotation on charts.

See the accompanying notebook (Python-Project-for-Data-Science.ipynb) for code, full data workflow, and interactive visuals.