**Project Title:** **A Decade of Google Stock Performance: Price, Volatility, and Volume Trends (2015–2024)**

**Objective:** To analyze the historical daily stock performance of Alphabet Inc. (GOOGL) from 2015 to 2024, using Tableau Public to visualize key metrics such as price trends, daily returns, trading volume, and volatility. The goal is to identify patterns, assess risk, and deliver actionable insights in a clean, interactive dashboard.

**Dataset Overview:**

* **Source:** Google Finance (via Kaggle)
* **Ticker:** GOOGL (Alphabet Inc. Class A shares)
* **Frequency:** Daily trading days
* **Date Range:** January 1, 2015 – December 31, 2024
* **Fields:**
  + Date
  + Open, High, Low, Close prices
  + Volume (number of shares traded)

**Data Enhancements:** To enable deeper analysis, the following features were engineered:

* **Year, Month, Year-Month:** For time-based aggregation
* **Daily Return (%):** (Today’s Close - Previous Close) / Previous Close \* 100
* **30-Day Moving Average (MA):** Rolling average of Close over 30 trading days
* **Volatility:** High - Low (daily price range)

**Tools Used:**

* Tableau Public Desktop
* Microsoft Excel / Python (for data pre-processing)

**Dashboard Components:**

**1. Price Trend Visualization**

* **Chart Type:** Dual Line Chart
* **Fields:** Close Price vs 30-Day Moving Average
* **Time Frame:** Full period (2015-2024)
* **Purpose:** Understand long-term stock movement and smoothing of trends using MA

**2. Daily Return Distribution (Histogram)**

* **Chart Type:** Histogram
* **Fields:** Binned Daily Return (%)
* **Purpose:** Analyze volatility and risk distribution. Identifies how frequently stock moves fall within certain return intervals.

**3. Monthly Average Close Price**

* **Chart Type:** Line Chart
* **Fields:** Year-Month, AVG(Close)
* **Purpose:** Observe average price fluctuations over time. Useful for seasonal trends.

**4. Total Monthly Volume**

* **Chart Type:** Bar Chart
* **Fields:** Year-Month, SUM(Volume)
* **Purpose:** Track trading activity and volume spikes which may align with major events.

**5. Monthly Average Volatility**

* **Chart Type:** Line Chart
* **Fields:** Year-Month, AVG(Volatility)
* **Purpose:** Examine consistency and changes in daily price swings, signaling market uncertainty.

**6. Filter Options**

* **Controls:** Year selector, Month selector
* **Purpose:** Enable interactive filtering across charts for user-driven analysis

**Findings:**

* GOOGL's long-term growth trend is evident with peaks in 2021 and 2024, despite temporary corrections.
* The 30-Day Moving Average aligns well with macro events, confirming the smoothing of sharp volatility.
* Daily returns are centered around 0% but display a fat-tail distribution, suggesting rare but significant outliers.
* Monthly volumes surged during high-volatility periods and aligned with major announcements, indicating strong investor reaction.
* Volatility peaked sharply in early 2020, likely tied to COVID-19 uncertainty, and again post-2023 during tech sector upheavals.

**Recommendations:**

* Investors should monitor average volatility and volume together to anticipate potential price movements.
* Strategic entry points can be optimized using historical return bands and trendline intersections with the moving average.
* Analysts should account for seasonality and earnings cycles, as volume and volatility spikes cluster around these periods.

**Conclusion:** This dashboard provides a cohesive analytical view of Alphabet Inc.'s Class A stock behavior. By combining price movement, volatility, volume, and returns, we enable a well-rounded performance evaluation. This can serve investors, analysts, and learners interested in time-series stock dynamics and Tableau data storytelling.

**Link to Dashboard:**