**Twitter Stock Market Analysis Project Report**

**1. Introduction**

This project aims to analyze Twitter's stock market performance from 2018 until its delisting. Using Python-based data analysis techniques, the study identifies key stock price trends, market volatility, investor trading behavior, and major events that influenced stock fluctuations. The analysis is enhanced with statistical tests, visualizations, and an interactive dashboard.

**2. Methodology**

To ensure a structured and data-driven analysis, the following steps were undertaken:

* **Data Collection:** Acquired historical stock data of Twitter (TWTR) from 2018 onwards.
* **Data Cleaning:** Processed missing values, formatted dates, and ensured numerical integrity.
* **Statistical Analysis:** Conducted T-tests and Chi-Square dependency tests to study price relationships.
* **Visualization:** Generated various stock trend graphs, volume charts, and word clouds for insights.
* **Dashboard Development:** Built an interactive Python Streamlit dashboard for real-time data exploration.

**3. Requirement Analysis**

For this project, the following tools and technologies were used:

* **Programming Language:** Python
* **Libraries:** Pandas, NumPy, Matplotlib, Seaborn, Plotly, SciPy, Word Cloud, Streamlit
* **Dataset:** Historical stock price data (TWTR.csv)
* **Software:** Google Collab, Streamlit for dashboard creation
* **Visualization Tools:** Power BI, Matplotlib and Plotly for interactive graphs
* **Statistical Analysis:** SciPy for hypothesis testing (T-test, Chi-Square test)

**4. Other Parameters**

During the analysis, the dataset was examined for inconsistencies and optimized for meaningful insights. The following data processing steps were implemented:

* **Handling Missing Values:** Rows with missing stock prices were removed to maintain accuracy.
* **Date Formatting:** Converted date strings into a proper DateTime format for trend analysis.
* **Event Impact Analysis:** Correlated stock price movements with company announcements and financial reports.
* **Stock Trend Calculations:** Implemented moving averages and price volatility metrics.

**5. Data Visualizations**

Several key visualizations were created to represent Twitter’s stock performance over time. These charts helped in understanding price trends, trading volume shifts, and market reactions.

• **Line Chart:** Twitter’s Closing Price Trend (2018 - Present)

• **Bar Chart:** Trading Volume Trends Over Time

• **Word Cloud:** Key Market Insights & Stock Behavior

**6. Insights from the Charts & Dashboard**

The visualizations and statistical tests led to several important insights:

* **Stock Price Trends:** Twitter's stock exhibited significant fluctuations with clear uptrends and downturns.
* **Market Volatility:** The T-test revealed strong differences between high and low prices, indicating stock volatility.
* **Investor Activity:** Trading volume spikes aligned with major events such as earnings reports and company announcements.
* **Stock Price Dependencies:** The Chi-Square test showed that High, Low, and Close prices were dependent, indicating structured market behavior.
* **Impact of Delisting:** The stock price trend before delisting showed a final adjustment, reflecting investor sentiment.

**7. Conclusion**

The analysis successfully demonstrated how statistical tests, visualizations, and dashboards can be used to interpret stock market behavior. Twitter's stock was highly volatile, influenced by external factors such as company policies, market news, and investor sentiment. The interactive dashboard allowed users to explore stock trends dynamically, making it a valuable tool for analysts and traders.