

# Tesla Stock Market Data Analysis

Data Cleaning, Key Findings, and Patterns

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# Data Cleaning Approach

Checked for missing values in key columns (e.g., Open, Close, Volume).

Used forward-fill method for missing numerical values in time series data.

Dropped rows with missing date values, as they were crucial for accurate time-based analysis.

Applied statistical methods (e.g., IQR) to detect and remove outliers, especially in stock price volatility.

Standardized column names and ensured that the data types (e.g., datetime, float) were appropriate for analysis.

# Key Findings from the Analysis

Observed a significant increase in Tesla's stock price starting from early 2020, coinciding with major product announcements and global interest in electric vehicles.

Tesla's stock exhibited high volatility, with sharp price fluctuations, particularly around earnings reports or product launches.

Identified seasonal patterns where stock performance peaked in Q1 and Q4, likely due to quarterly earnings reports and product deliveries.

# Technical Challenges Encountered

Handling gaps in stock market data, especially during holidays or weekends when markets were closed, was challenging.

Time zone inconsistencies in timestamps required additional handling to align stock data across different time zones.

The high volatility of Tesla stock introduced "noise" into the data, making it difficult to identify long-term trends without filtering out short-term fluctuations.

Creating meaningful features (e.g., moving averages, price momentum) required careful design and testing to ensure they were useful in predictive models.

# Conclusion & Next Steps

The analysis uncovered valuable insights into Tesla's stock price trends, volatility, and the impact of key events.

Further explore predictive modeling using machine learning to forecast stock prices.

Investigate other external factors, such as social media sentiment, that might affect Tesla's stock market performance.