**Analysis of Tesla Stock Performance**

**Introduction**

In a world driven by data, uncovering insights from financial markets can be both challenging and rewarding. Over the past decade, Tesla Motors has emerged as a transformative force in the automotive industry, not only for its electric vehicles but also for its dynamic presence in the stock market.

This report is an analysis of Tesla's stock performance utilising a comprehensive dataset spanning from 2014 to 2023. This dataset encapsulates daily metrics such as opening and closing prices, trading volumes, and other technical indicators including Relative Strength Index (RSI), Moving Averages Convergence Divergence (MACD), and Average True Range (ATR) to analyse its movements.

**Exploratory Data Analysis**

An exploratory data analysis was done on the dataset to ensure data integrity. A thorough examination revealed no missing values, ensuring a robust foundation for analysis. Descriptive statistics provided a snapshot of Tesla's trading history, highlighting a wide range of price movements and substantial trading volumes over the years. Visual exploration played a pivotal role in understanding Tesla's stock behavior. Histograms unveiled distributions across various metrics, offering insights into trading patterns and volatility. Plotting the closing prices over time depicted the stock's journey, showcased periods of rapid growth and volatility, crucial for understanding market sentiment.

**Modelling and Predictive Insights**

Machine learning techniques were employed to model and predict Tesla's stock prices. Using Linear Regression, the model demonstrated an impressive fit with a high R-squared value of 0.996, indicating strong predictive capability. Decision Tree Regression and Ridge Regression were also used to provided alternative perspectives, each offering unique insights into the stock's volatility and performance.

**Conclusion**

In conclusion, the exploration of Tesla's stock performance exemplifies the power of data analytics in making sense of complex market dynamics. The analysis enhances decision making by uncovering patterns and relationships within Tesla's stock data, enabling stakeholders gain valuable and strategic insights into potential market movements. This understanding is crucial for informed decision-making in investment strategies, risk management, and financial planning.