**Project name:** **Stock Price Prediction and Analysis**

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This notebook is used for **Stock Price Prediction and Analysis**, mainly to understand trends in Tesla's stock prices and attempt to predict future movements. Here’s why each step in the code is important:

### ****1. Data Exploration & Cleaning****

* **Why?** Before building a model, we need to understand the dataset—check for missing values, visualize trends, and clean unnecessary columns.
* **Example:** Dropping "Adj Close" because it's often the same as "Close", avoiding redundant information.

### ****2. Data Visualization****

* **Why?** Helps identify patterns, outliers, and relationships in stock prices.
* **Example:** Plotting stock prices over time helps us see trends like increasing or decreasing prices.

### ****3. Data Preprocessing****

* **Why?** Prepares data for machine learning by standardizing features and splitting data into training/testing sets.
* **Example:** StandardScaler is used to normalize stock prices and volumes, improving model performance.

### ****4. Machine Learning Models****

* **Why?** To classify or predict stock price movements based on historical data.
* **Example:**
  + **Logistic Regression & SVC**: Used for binary classification (e.g., predicting whether the price will go up or down).
  + **XGBoost Classifier**: A more powerful, tree-based model that often performs better in stock prediction tasks.

### ****5. Model Evaluation****

* **Why?** To measure how well the models perform and choose the best one for predictions.
* **Example:** Accuracy, precision, recall, and confusion matrices are used to analyze prediction performance.

Would you like me to explain any specific part in more detail?