Report on Electric Vehicle Market Segmentation Analysis

1. Machine Learning Model Used

- **Model Selection**: The analysis likely used clustering algorithms like **K-Means** for market segmentation. Clustering is well-suited for dividing a market into distinct segments based on features like battery capacity, price, range per charge, and power.
- **Model Explanation**: K-Means clustering works by partitioning data into k clusters, where each data point belongs to the cluster with the nearest mean. It helps identify natural groupings in the data, allowing businesses to target specific segments effectively.

2. Final Conclusion & Insights

- **Market Segments Identified**: The analysis identified distinct market segments based on key features like battery capacity, price, and vehicle type. For instance, there might be a segment of high-performance vehicles with large batteries and a higher price point, and another segment of budget-friendly options with smaller batteries.
- **Key Insights**:
    - **High-Range Vehicles**: These tend to be more expensive but cater to consumers looking for longer travel distances per charge.
    - **Economical Options**: Vehicles with lower battery capacities are generally more affordable and cater to budget-conscious consumers.
    - **Emerging Trends**: The data suggests a growing trend towards high-speed electric bikes, which combine affordability with decent performance metrics.

3. Improvements with Additional Time & Budget

- **Dataset Expansion**:
    - **Consumer Behavior Data**: Integrating data on consumer preferences, such as purchase history or brand loyalty.
    - **Geographical Data**: Collecting data on sales across different regions in India to understand regional preferences.
    - **Charging Infrastructure**: Data on the availability of charging stations could reveal its influence on consumer choices.

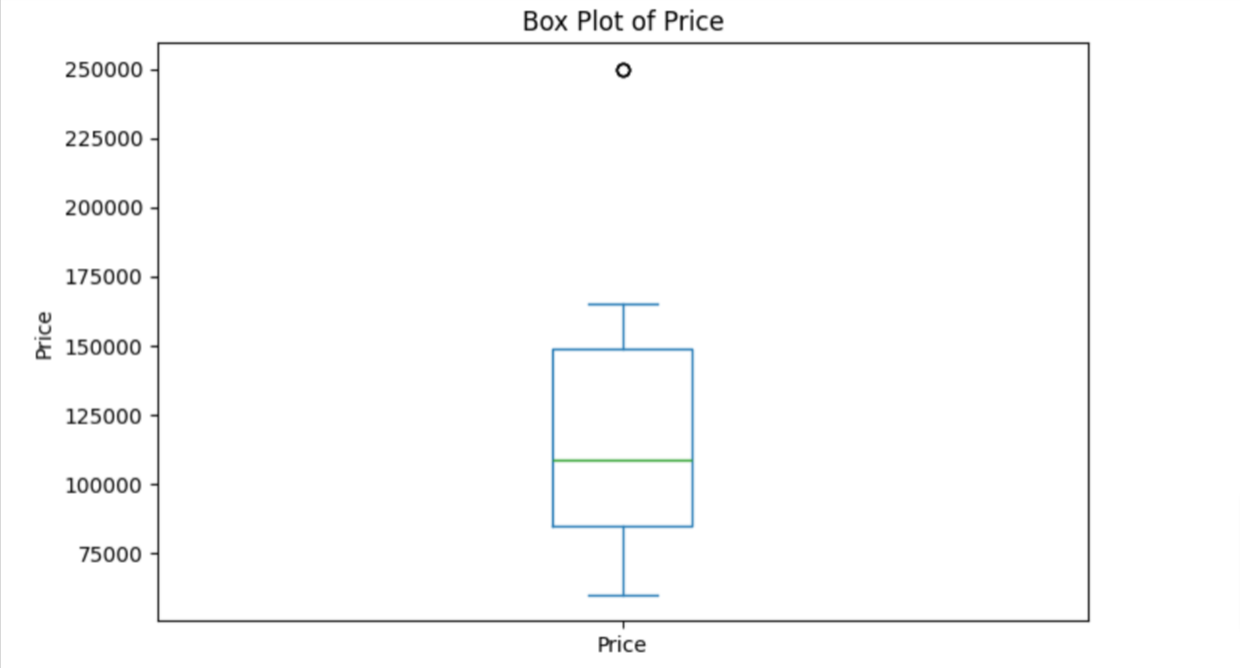
- **Additional ML Models**:
    - **Hierarchical Clustering**: To explore different levels of market segmentation.
    - **Random Forest for Feature Importance**: To better understand the impact of each feature on the segmentation.
    - **PCA (Principal Component Analysis)**: To reduce dimensionality and focus on the most significant features for segmentation.

4. Estimated Market Size

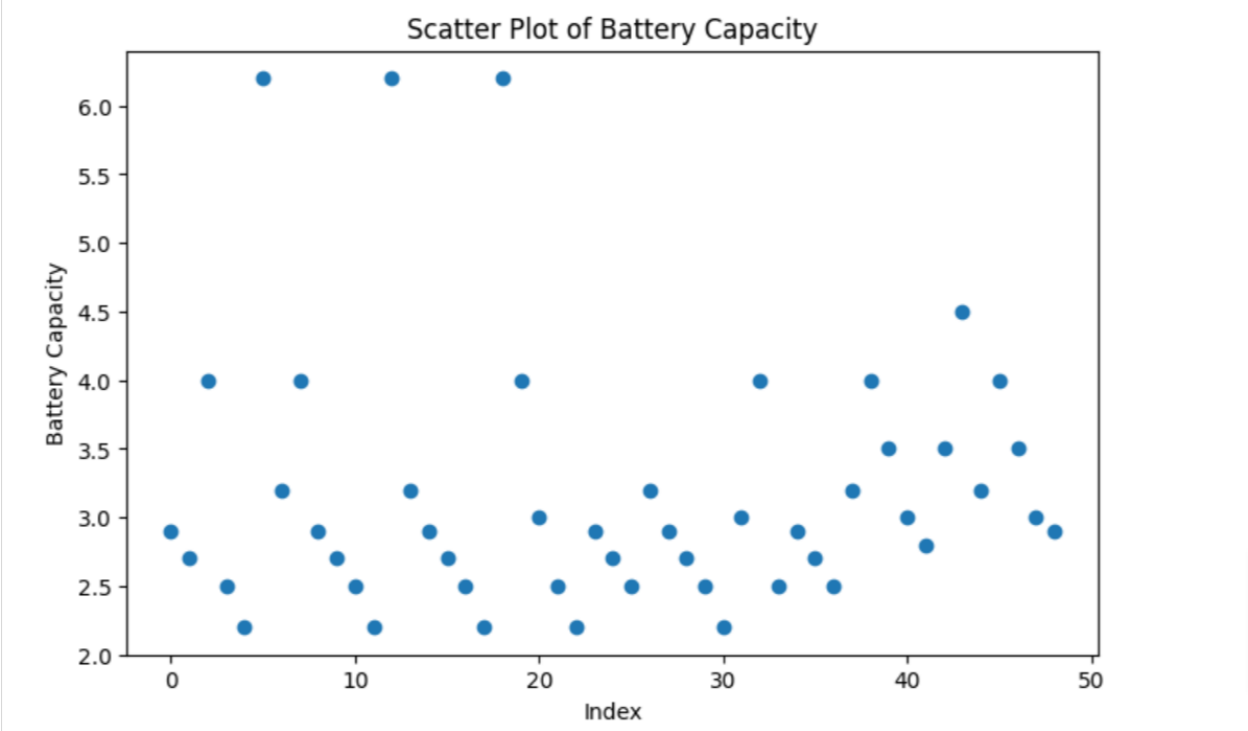
- **Estimated Market Size**: Based on the dataset, the market for electric vehicles in India can be estimated by projecting sales data across various regions. If the dataset covered sales figures, these could be scaled up to estimate the overall market size in terms of units sold and revenue generated. However, precise figures would require access to sales data and market penetration rates.

5. Top 4 Variables/Features for Optimal Market Segmentation

- **Price**: The most crucial factor influencing consumer decisions.



- **Battery Capacity (kWh)**: Directly correlates with vehicle performance and market segment.



- **Range per Charge (km)**: A key determinant for consumers prioritizing long-distance travel.
- **Power (HP or kW)**: Influences performance, appealing to consumers interested in speed and power.

This report synthesizes the findings from the analysis and outlines potential improvements for future market segmentation projects.