

EV Market Segmentation

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Code Implementation- <https://github.com/NikhilEdiga/FEYNNLABS>

Problem Statement:

You are a team working under an Electric Vehicle Startup. The Startup is still deciding in which vehicle/customer space it will develop its EVs.

You have to analyze the Electric Vehicle market in India using Segmentation analysis and come up with a feasible strategy to enter the market, targeting the segments most likely to use Electric vehicles.

Fermi Extraction :- 1. Number of Electric Cars in a Hypothetical City:

- Population of the city: 1,000,000
- Percentage of the population that owns a car: 20%
- Percentage of car owners who own electric cars: 5%

Estimation: • Number of car owners = $1,000,000 * 20\% = 200,000$

- Number of electric car owners = $200,000 * 5\% = 10,000$

2. Number of Cars Produced Annually in India:

- Total Population of India: 1.3 billion
- Average Household Size: 4
- Percentage of Households Owning a Car: 1 in 10
- Average Car Life: 10 years

Estimation:

- Number of Households in India = $1,300,000,000 / 4 = 325,000,000$ households
- Number of Car-Owning Households = $325,000,000 / 10 = 32,500,000$ households
- Number of Cars Replaced Annually = $32,500,000 / 10 = 3,250,000$ cars per year

3. Number of Electric Cars Globally:

- Total World Population: Approximately 7.8 billion
- Percentage of the global population that owns a car: Let's assume 15% (car ownership varies widely by country and region). Percentage of car owners who own electric cars: Let's assume 10% (considering the growing popularity of electric cars).

Estimation:

- Number of car owners globally = $7,800,000,000 * 15\% = 1,170,000,000$
- Number of electric car owners globally = $1,170,000,000 * 10\% = 117,000,000$ So, based on these estimations, we can estimate that there are approximately 117 million electric cars globally.

Data Sources:

<https://www.kaggle.com/datasets/geoffnel/evs-one-electric-vehicle-dataset>

<https://www.kaggle.com/code/agarwalvishal00/ev-dataset-eda-and-regression>

1.Behavioral Segmentation:

Dataset 1: behavioral_dataset.csv

Packages and tools used are:

Numpy

Pandas

Sklearn

Matplotlib

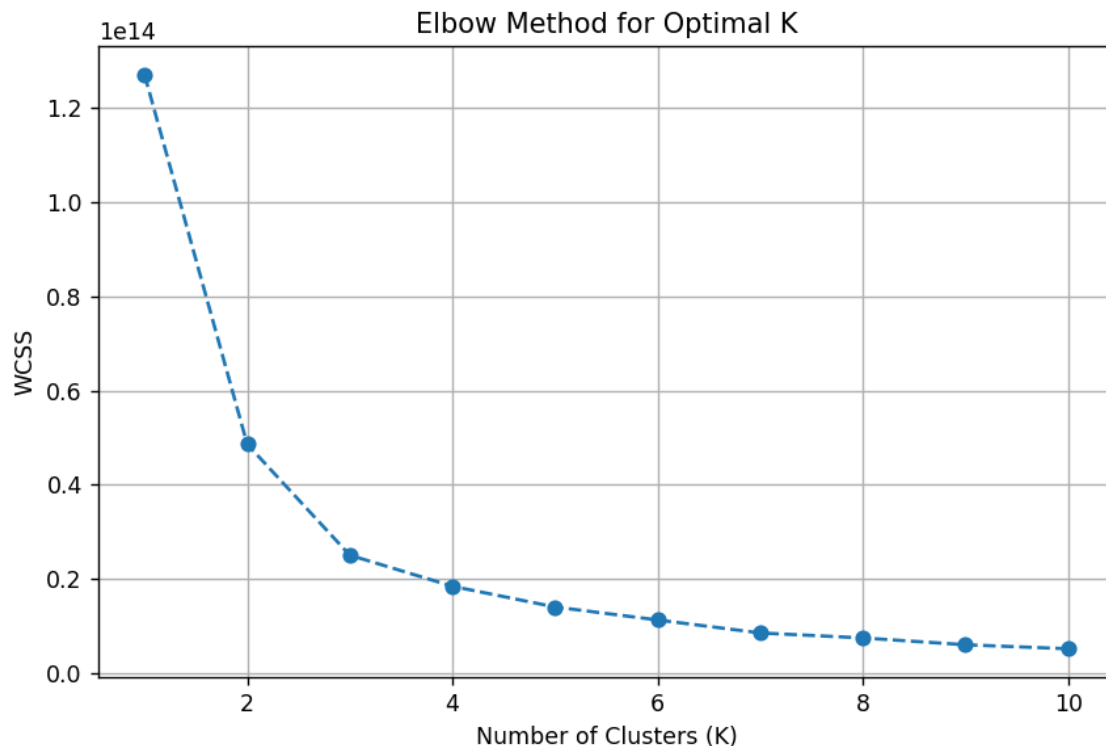
Seaborn

Exploratory Data Analysis (EDA): Started EDA with some data. In this we have compared our data in different aspects such as Age , Total Salary , Number of Dependants etc.

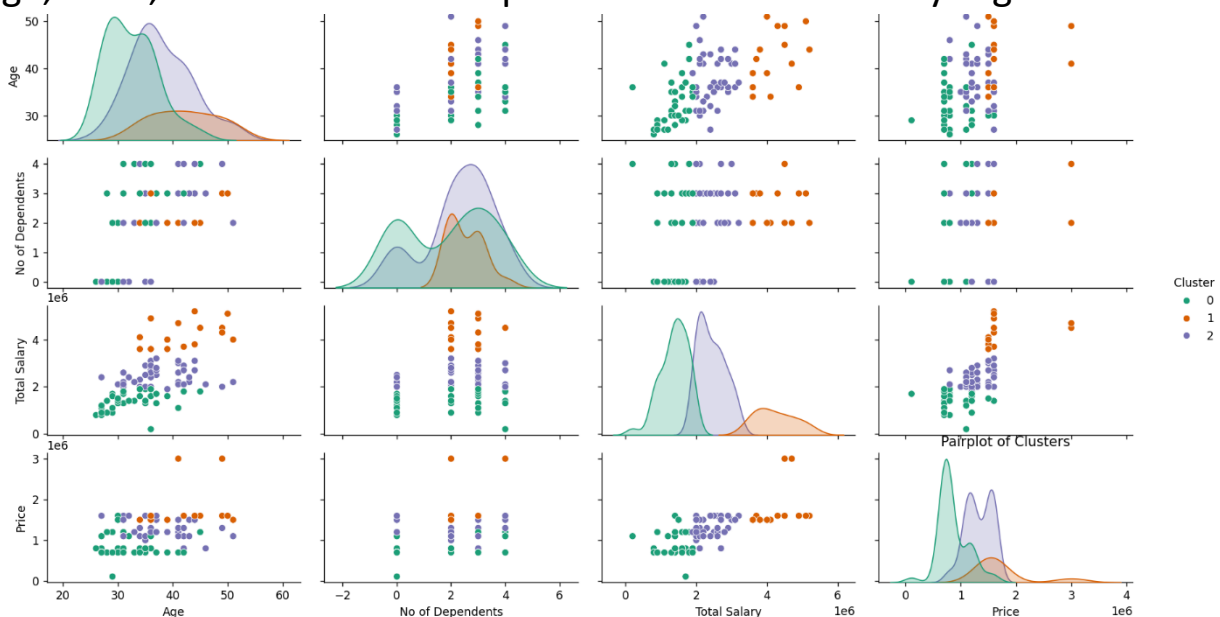
K-Means Clustering:

WCSS is the sum of the squared distance between each point and the centroid in a cluster. When we plot the WCSS with the K value, the plot looks like an Elbow. As the number of clusters increases, the WCSS value

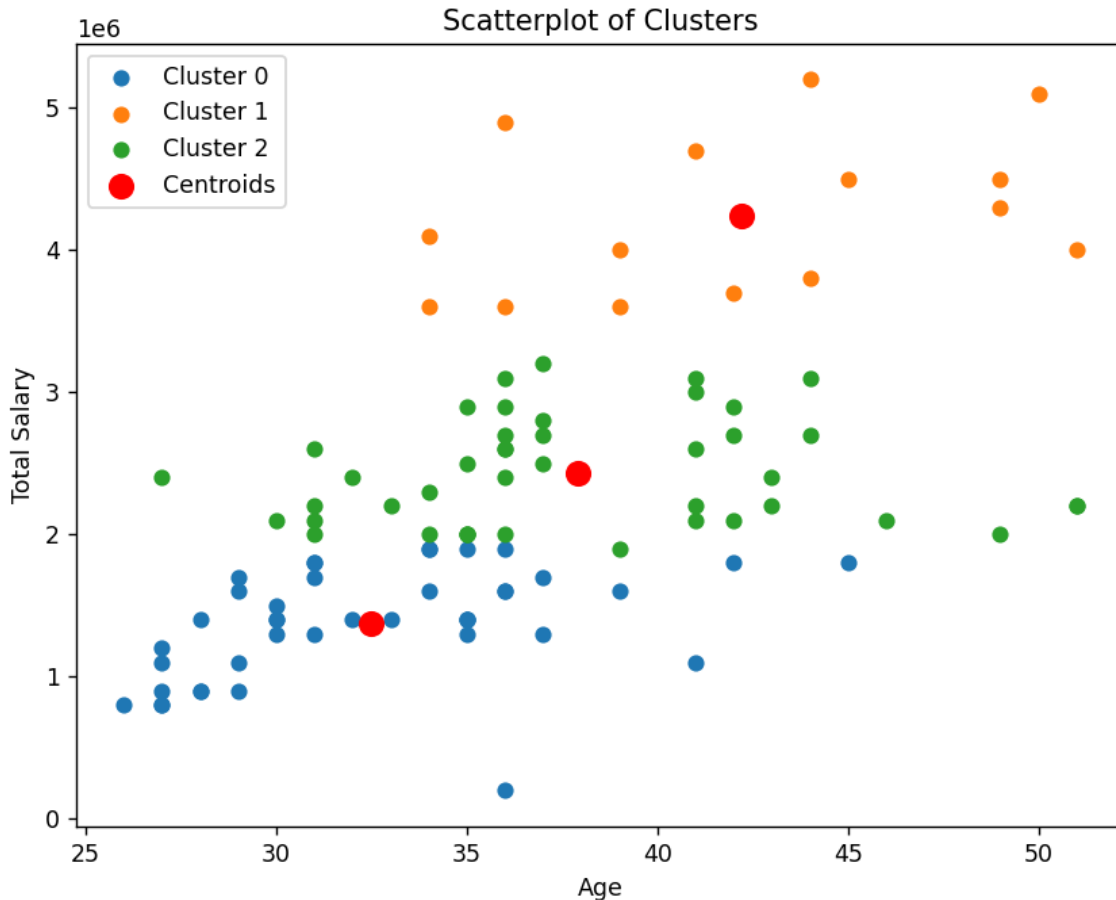
will start to decrease.



Pairplot: Seaborn is a Python data visualization library based on matplotlib. It provides a high-level interface for drawing attractive and informative statistical graphics. Pairplot towards each Attributes like Age, Price, Total number of Dependents and Total Salary is given below.



Scatter Plot: Sometimes the data points in a scatter plot form distinct groups. These groups are called clusters. The scatterplot of attributes in behavioural Segmentation is given below.



Dataset 2: EV Population Data.csv

Packages and tools used are

Numpy

Pandas

Sklearn

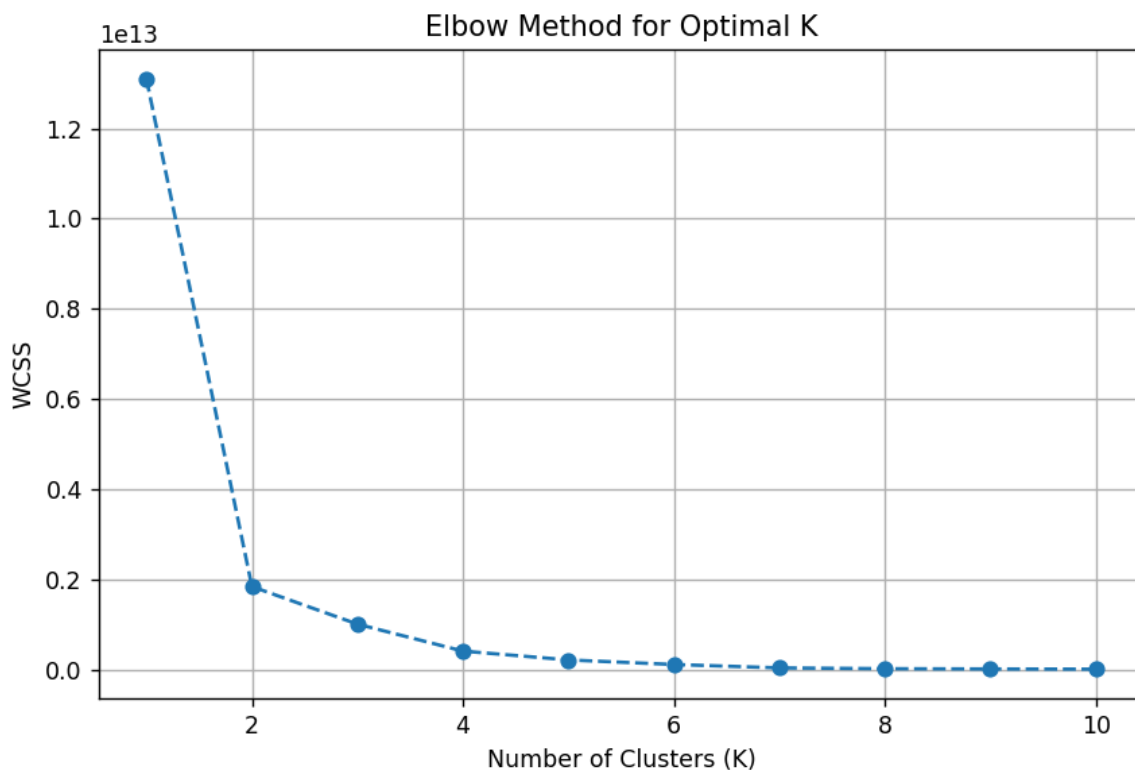
Matplotlib

Seaborn

Exploratory Data Analysis (EDA): Started EDA with some data. In this we have compared our data in different aspects such as cars , top speed , price etc.

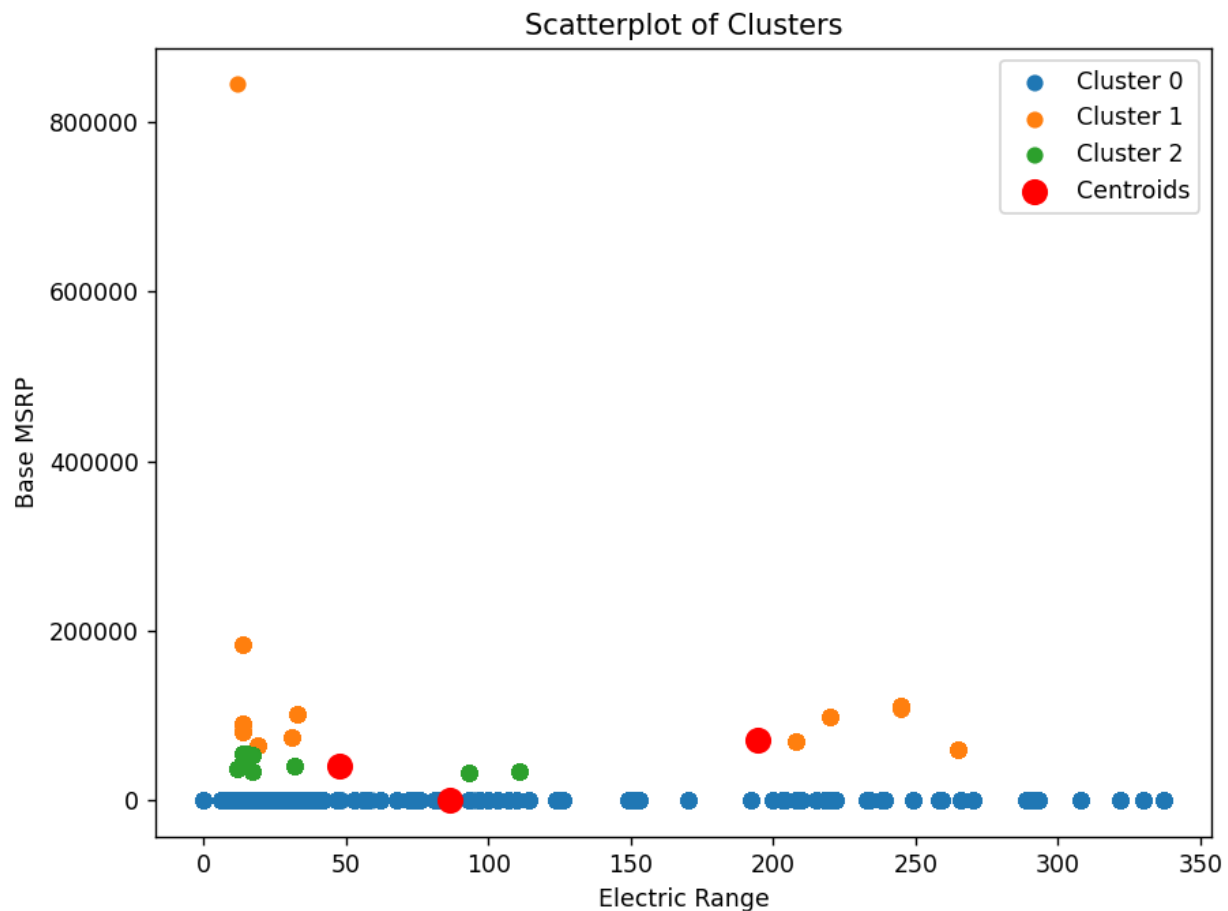
K-Means Clustering:

WCSS is the sum of the squared distance between each point and the centroid in a cluster. When we plot the WCSS with the K value, the plot looks like an Elbow. As the number of clusters increases, the WCSS value will start to decrease.



Scatter Plot: Sometimes the data points in a scatter plot form distinct groups. These groups are called clusters. The scatterplot of attributes

in behavioural Segmentation is given below.



Dataset 3: India EV Market.csv

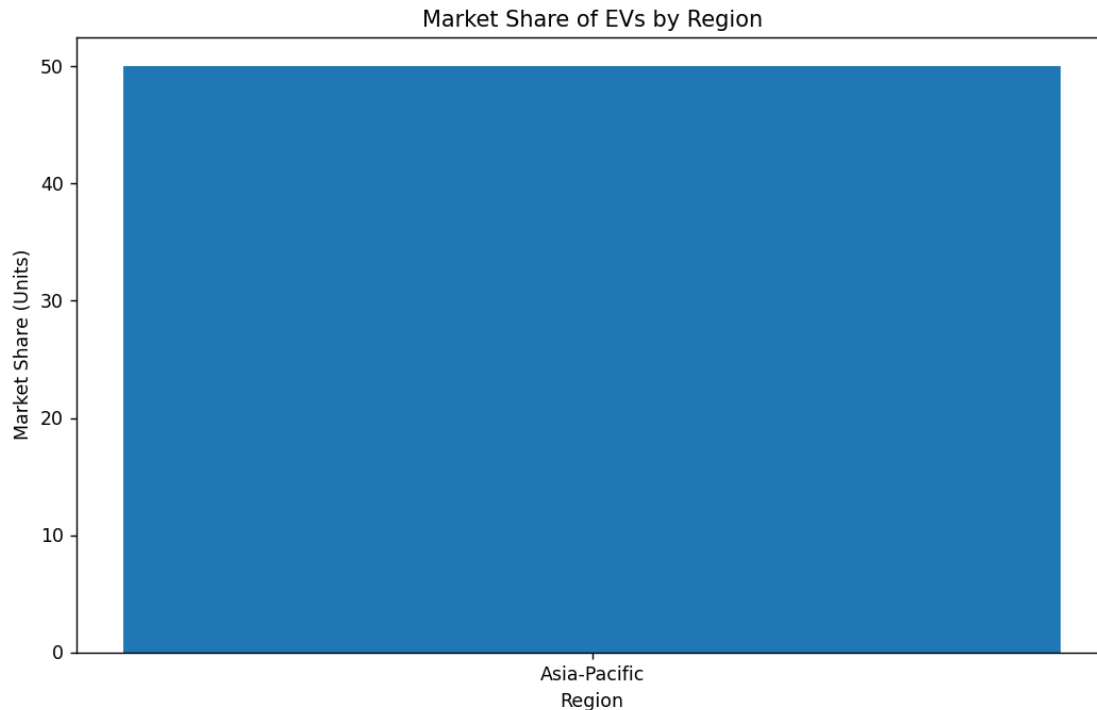
Packages and tools used are

Pandas

Matplotlib

Exploratory Data Analysis (EDA): Started EDA with some data. In this we have compared our data in different aspects such as cars , top speed , price etc.

BarPlot: A bar plot represents an aggregate or statistical estimate for a numeric variable with the height of each rectangle and indicates the uncertainty around that estimate using an error bar. BarPlot for Market share by Region is given below.



Conclusion: In the grand symphony of the Electric Vehicle (EV) market, our strategic composition concludes with a crescendo of insights and harmonized market segmentation. Just as a seasoned conductor selects the most talented musicians for each section, we have pinpointed the most optimal market segments to fine-tune our offerings. Imagine our strategy as a painter's palette, with distinct colors representing different customer preferences. For the sub-15 lakhs price range, we've chosen the vibrant shade of 7-seater configurations to resonate with the rhythm of family-oriented affordability. In contrast, the canvas above 15 lakhs is adorned with 5-seater cars, each stroke depicting advanced technology, safety, and dynamic performance. Customizing the marketing mix is our brushstroke of brilliance. We blend product offerings, pricing strategies, promotional techniques, and

distribution channels like an artist mixing colors to create a masterpiece. We paint affordability, spaciousness, and eco-friendliness in the 7-seater segment while adding sophistication, innovation, and exhilaration to the 15 lakhs and above segment. Picture our strategy as a ship setting sail, calculating potential profits in the early market is our compass. It guides us through uncharted waters, helping us navigate toward the treasure trove of profitability. In the grand gallery of market opportunities, we have curated our artful approach. By targeting the right segments with tailored offerings and harmonizing our marketing mix, we aim to create a masterpiece in the EV market—a symphony of success that resonates with customers and reverberates with profits.