

# **INDIAN MARKET ELECTRIC SCOOTER SENTIMENT ANALYSIS**

**A Data-Driven Study of Customer feedback on popular electric scooters in India**

**Presented By :**

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# Problem Statement

EV scooters represent the majority share (~88–90%) of electric two-wheeler sales in India. As of 2025, they contribute to **6–7%** of the overall two-wheeler market (petrol + electric).

**To accelerate adoption and expand market share, EV companies need to:**

- Gain deeper insights into customer sentiment
- Address recurring issues faced by buyers
- Strengthen brand trust and reliability
- Leverage positive customer feedback to boost sales

**Goal of the Study:**

- This study aims to provide actionable strategies for improving product sales by analyzing customer sentiment on leading electric scooter models in the Indian market.



# Data Source

Reviews are collected via web scraping from major bike review portals.

## Dataset fields:

- Reviewer ID
- Date of Review
- Review
- Range Reported
- Overall Rating

**Note:** Raw web scrapping code & data not shared due to confidentiality.



# Models Included for Study



**Tvs Iqube**



**Bajaj Chetak**



**Ather Rizta**



**Ola S1X**

# Methodology

## 1. Data Understanding

- Understand data format and structure
- Conduct preliminary exploratory data analysis
- Analyze numeric columns (range reported, overall rating)
- Remove outlier data if found

## 2. Sentiment Analysis

- Model Used: NLPTown BERT-base Multilingual Uncased Sentiment
- Specifically trained on product reviews
- Suitable for analyzing customer feedback
- Available at: <https://huggingface.co/nlptown/bert-base-multilingual-uncased-sentiment>

## 3. Visualization

- Word clouds and Treemap for visualization of frequent words in positive and negative reviews

## 4. Customer Segmentation

- Topic modeling to segment customers based on feedback
- Identify key customer groups and their concerns

## 5. Results Interpretation & Presentation

- Actionable insights and strategic recommendations

# TVS IQUBE



The TVS iQube is an electric scooter manufactured by TVS Motor Company, designed to provide eco-friendly urban mobility solutions. It features modern design, smart connectivity, and various model variants catering to different range requirements.

## Key Features:

- Multiple model variants with different range capabilities
- Smart connectivity features
- Modern design and comfortable seating
- Eco-friendly electric powertrain

# TVS iQube: Basic EDA Results

**Length of Dataset:** 316

	dt	overall_rating	range_reported
count	316	316.000000	83.000000
mean	2024-09-13 04:01:31.139240448	3.596203	83.614458
min	2021-09-30 00:00:00	0.000000	13.000000
25%	2024-08-09 06:00:00	2.500000	65.000000
50%	2024-10-22 00:00:00	4.200000	80.000000
75%	2025-02-20 18:00:00	5.000000	100.000000
max	2025-09-08 00:00:00	5.000000	350.000000
std	Nan	1.516068	37.964949

## Key Insight:

- At least 50% of users rate the model positively. However, there are also strong negative reviews with ratings  $\leq 2$ .

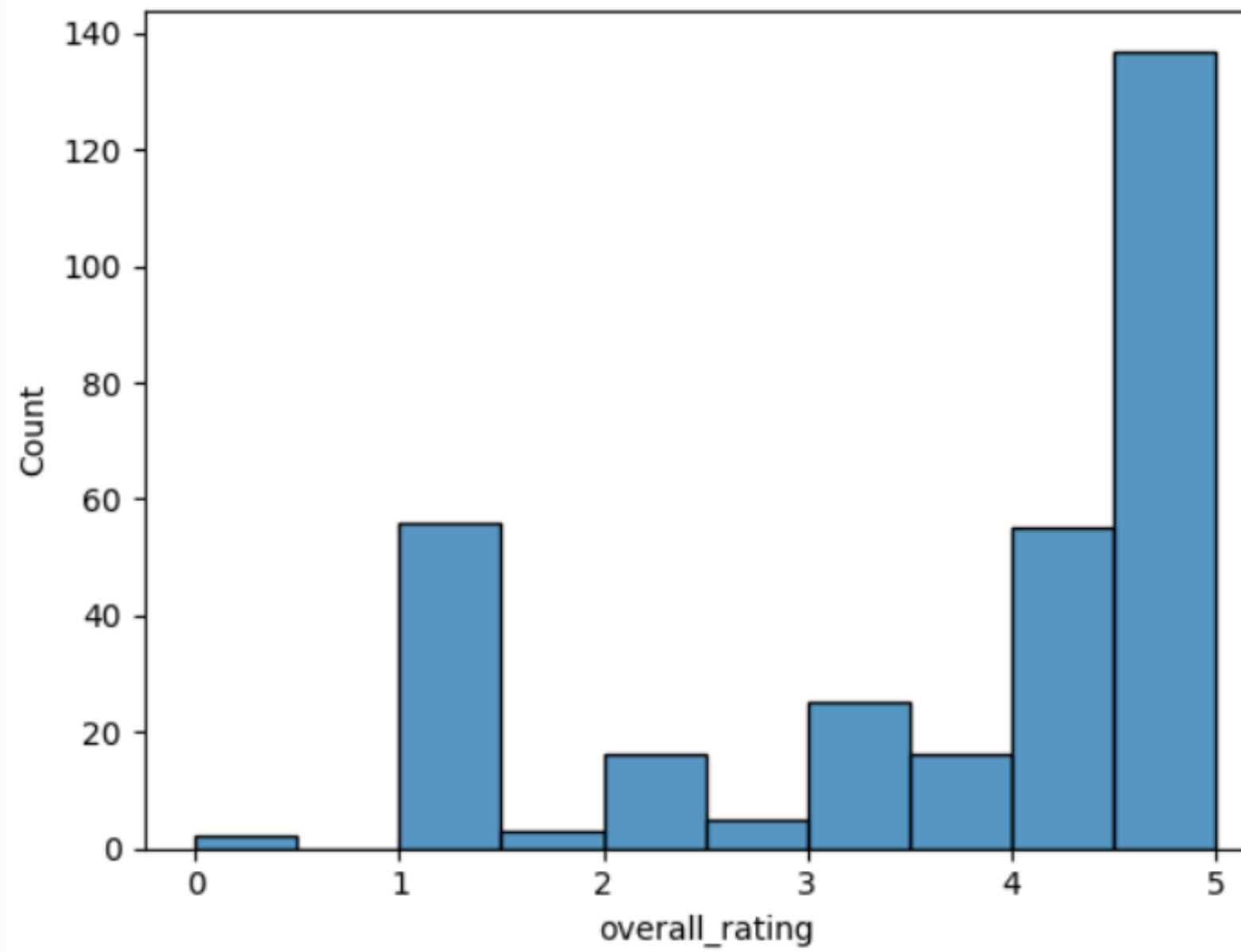
## Range Interpretation by Model Variant:

- Base Model (claimed 94 km): Expected real-world range 55-70 km
- Higher Variants: Expected real-world range 81-125 km. (Excluding outliers)

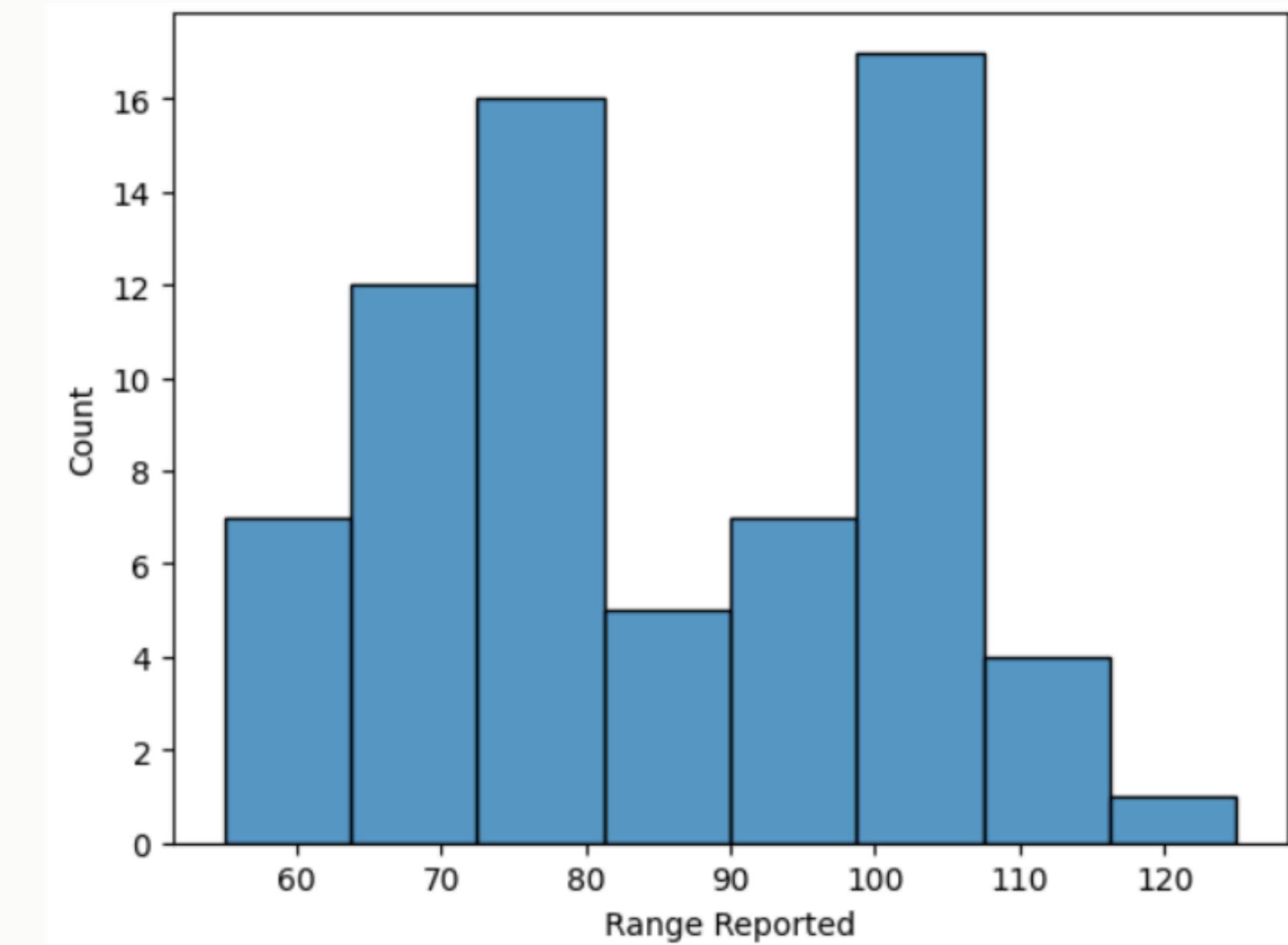
## Review Posting Date:

- Review posting date range from 30-09-2021 to 08-09-2025.

# Visualizations



**Histogram of Overall Rating Column**



**Histogram of Range Reported Column**

# Visualizations

Tree of Positive Words



A tree map of frequently occurring words in positive reviews

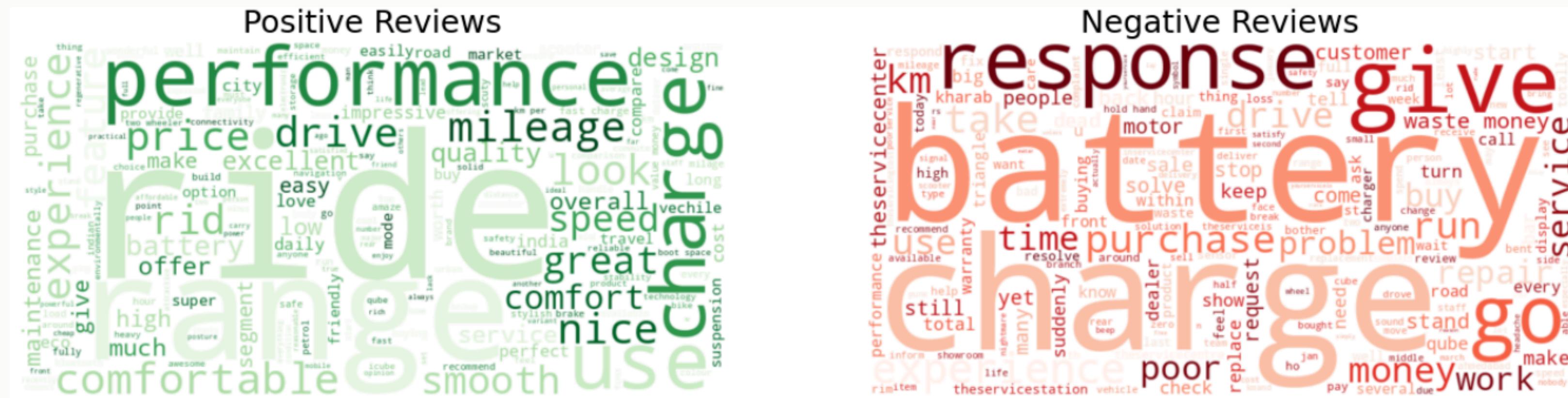
# Visualizations

Tree of Negative Sentiment Words



A tree map of frequently occurring words in negative reviews

# Sentiment Analysis Insights



## Positive Reviews - Key Strengths

## Frequently observed positive words:

- Ride - Smooth riding experience
  - Range - Satisfactory driving range
  - Design - Attractive appearance
  - Comfortable - Good seating comfort
  - Performance - Reliable driving performance

## **Customer Appreciation Points:**

- Attractive design and aesthetics
  - Comfortable seating arrangement
  - Smooth ride quality
  - Good driving performance
  - Acceptable driving range

## Negative Reviews - Areas for Improvement

### **Frequently observed negative words:**

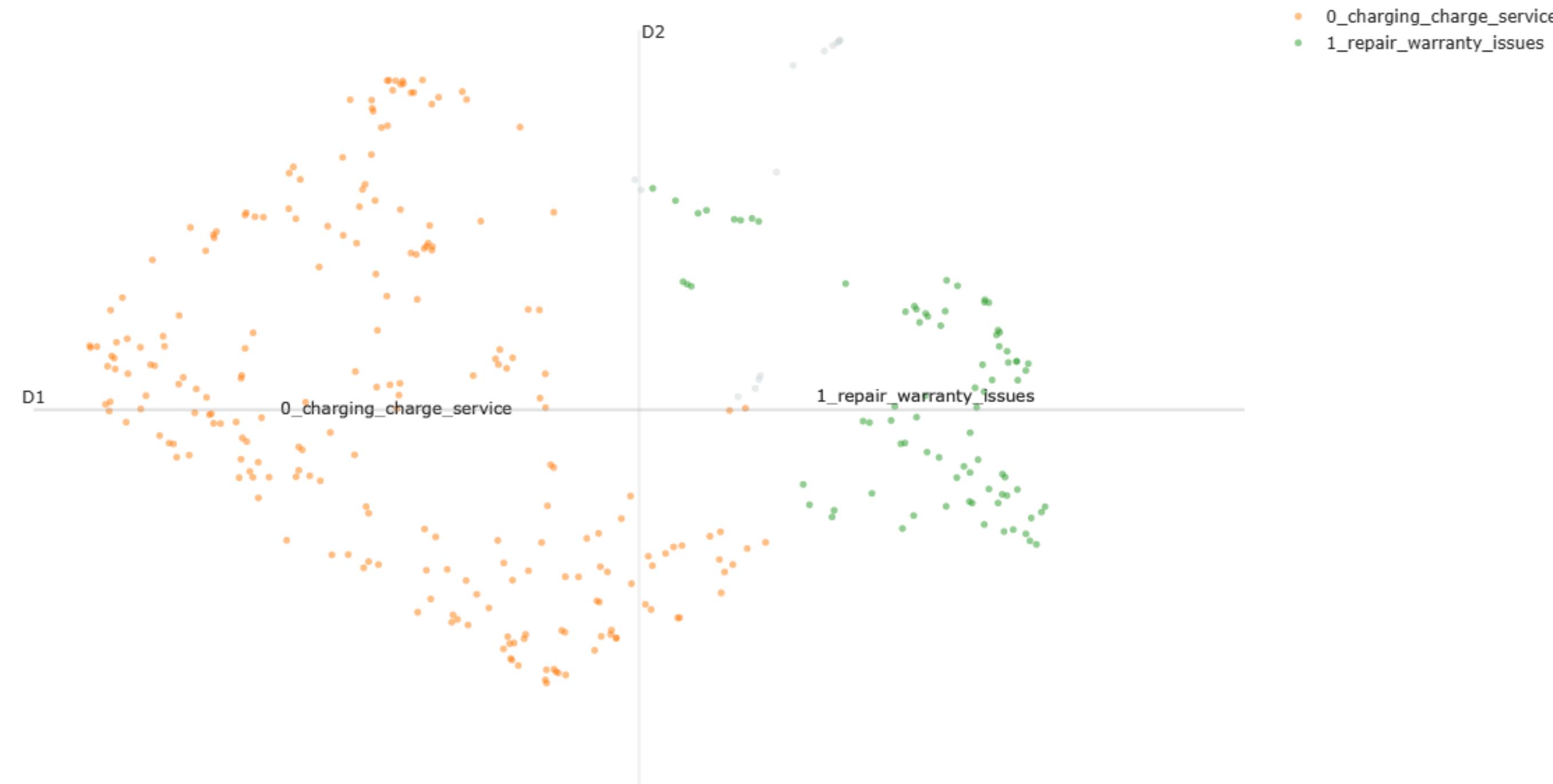
- Service Centre - Poor service experience
  - Response - Slow customer service response
  - Performance - Performance-related issues
  - Battery - Battery-related concerns
  - Charge - Charging problems
  - Money - High service costs

# Customer Pain Points:

- Poor response from service centers
  - High service and maintenance charges
  - Battery and charging system issues
  - Overall service center experience

# Customer Segmentation

Documents and Topics



# Customer Segmentation

## Two Main Customer Segments Identified

### **Segment 1: Dissatisfied Customers (Primary Focus Area) (Topic 1)**

- Complain about quality issues with the model
- Poor service center experience
- Negative feedback about after-sales support
- Battery and charging concerns

### **Segment 2: Satisfied Customers (Other Topics)**

- No significant product issues
- Decent service experience
- Praise the model for low maintenance
- Appreciate good mileage and performance

# Strategies to Improve TVS iQube

## Recommended Action Plan:

### 1. Enhance Product Quality

- Prioritize improvements in battery performance and reliability
- Focus on consistent product quality across variants

### 2. Strengthen Service Experience

- Provide in-depth training for service technicians on EV systems
- Focus on clear and empathetic communication with customers
- Improve response times and service quality
- Better explanation of service issues and solutions

### 3. Optimize Service Costs

- Reduce overall maintenance and service charges
- Make ownership more affordable and attractive
- Target family-segment buyers with cost-effective solutions

# BAJAJ CHETAK



The Bajaj Chetak is an electric scooter from Bajaj Auto, blending legacy design with modern EV engineering to cater to urban commuters. It features a sturdy metal build, smart connectivity, and multiple variants to meet diverse range and performance needs.

## Key Features:

- Multiple variants with different battery capacities and ranges (e.g. up to 153 km ARAI-certified for higher models)
- Smart features: Bluetooth/app connectivity, ride modes (Eco/Sport)
- Strong metal body design offering premium feel and durability

# Bajaj Chetak: Basic EDA Results

**Length of Dataset:** 167

	<code>date</code>	<code>overall_rating</code>	<code>range_reported</code>
<code>count</code>	165	164.000000	167.000000
<code>mean</code>	2025-05-19 22:06:32.727272704	3.532317	37.892216
<code>min</code>	2024-12-21 00:00:00	1.000000	0.000000
<code>25%</code>	2025-03-26 00:00:00	1.000000	0.000000
<code>50%</code>	2025-05-25 00:00:00	4.300000	0.000000
<code>75%</code>	2025-07-29 00:00:00	5.000000	54.500000
<code>max</code>	2025-09-28 00:00:00	5.000000	500.000000
<code>std</code>	NaN	1.650616	89.489047

## Key Insight:

- At least 50% of users rate the model positively. However, there are also strong negative reviews with ratings  $\leq 2$ .

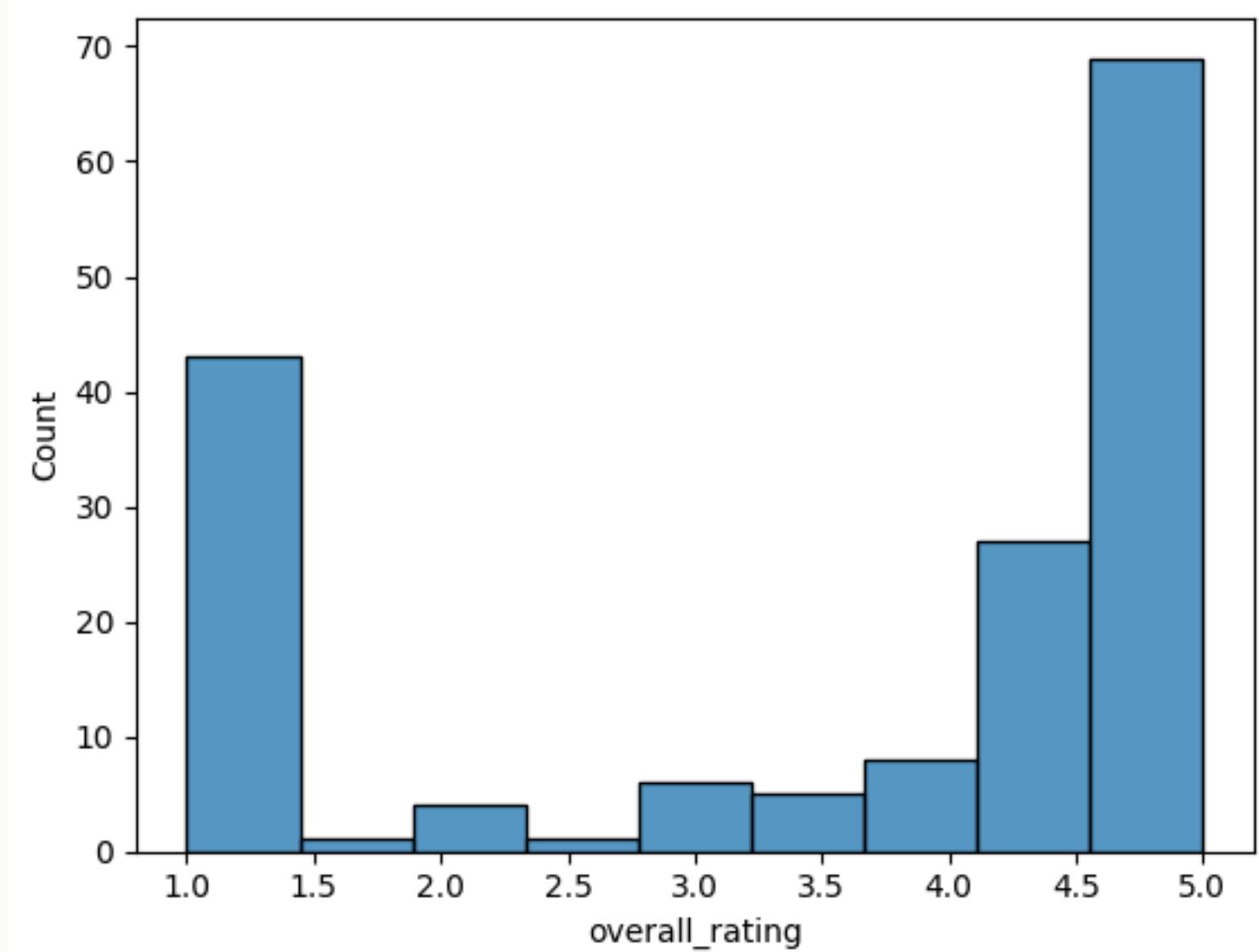
## Range Interpretation by Model Variant:

- Claimed Range for base model **127km** and higher variants range **151km**.
- Expected real-world range: **40-122 km**, range variation for different variants.

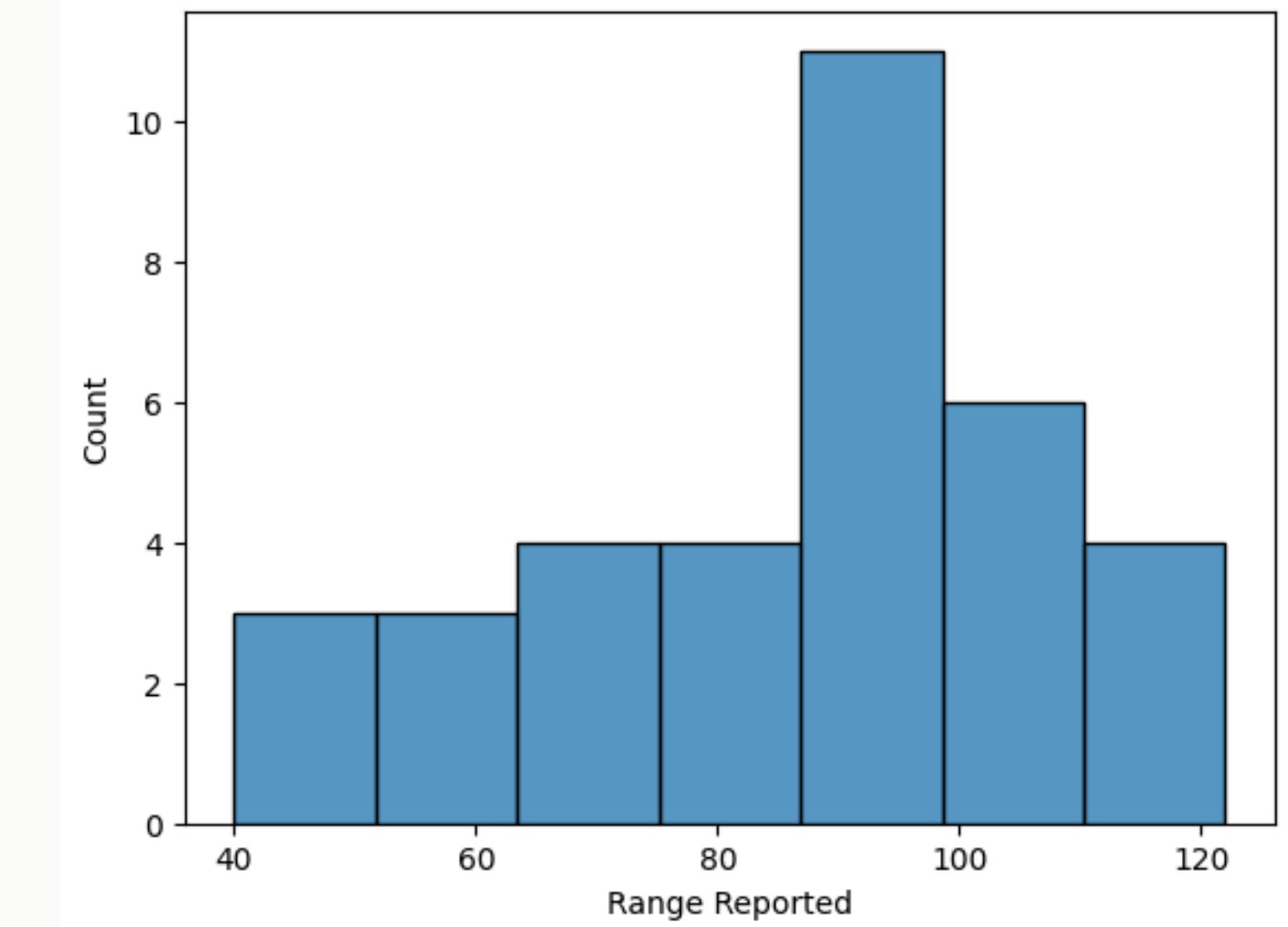
## Review Posting Date:

- Review posting date range from 21-12-2024 to 28-09-2025.

# Visualizations



**Histogram of Overall Rating Column**



**Histogram of Range Reported Column**

# Visualizations

Tree of Positive Sentiment Words



**A tree map of frequently occurring words in positive reviews**

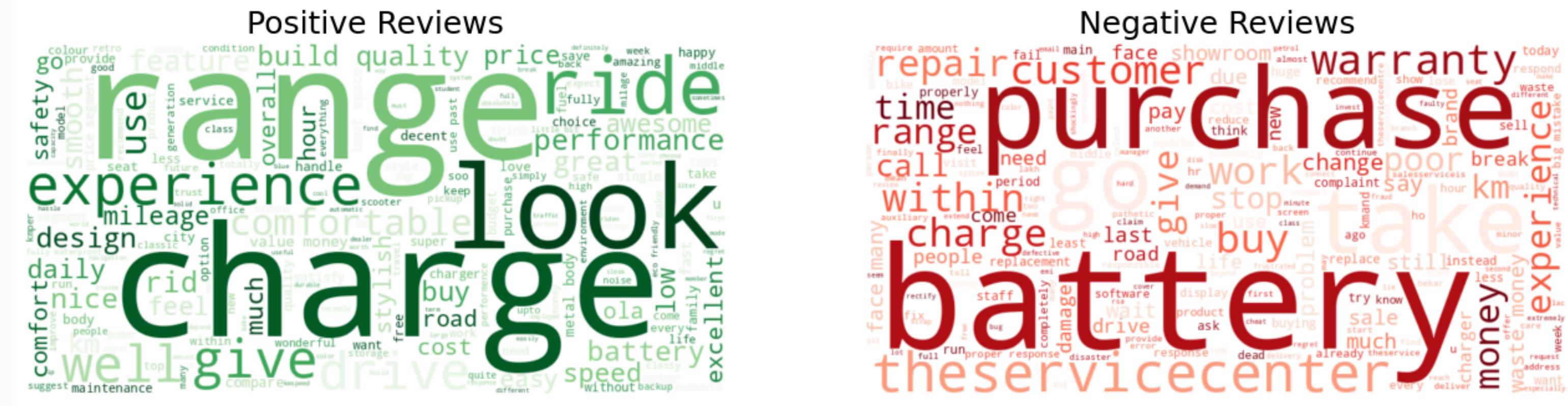
# Visualizations

Tree of Negative Sentiment Words



A tree map of frequently occurring words in negative reviews

# Sentiment Analysis Insights



## **Positive Reviews - Key Strengths**

## Frequently observed positive words:

- Ride - Smooth riding experience
  - Range - Satisfactory driving range
  - Look - Attractive appearance
  - Charge - Charging Efficiency

## Customer Appreciation Points

- Design & Build Quality
  - Smooth Ride Experience
  - Comfortable Seating
  - Good Performance
  - Decent Range & Charging Efficiency

## Negative Reviews - Areas for Improvement

## Frequently observed negative words:

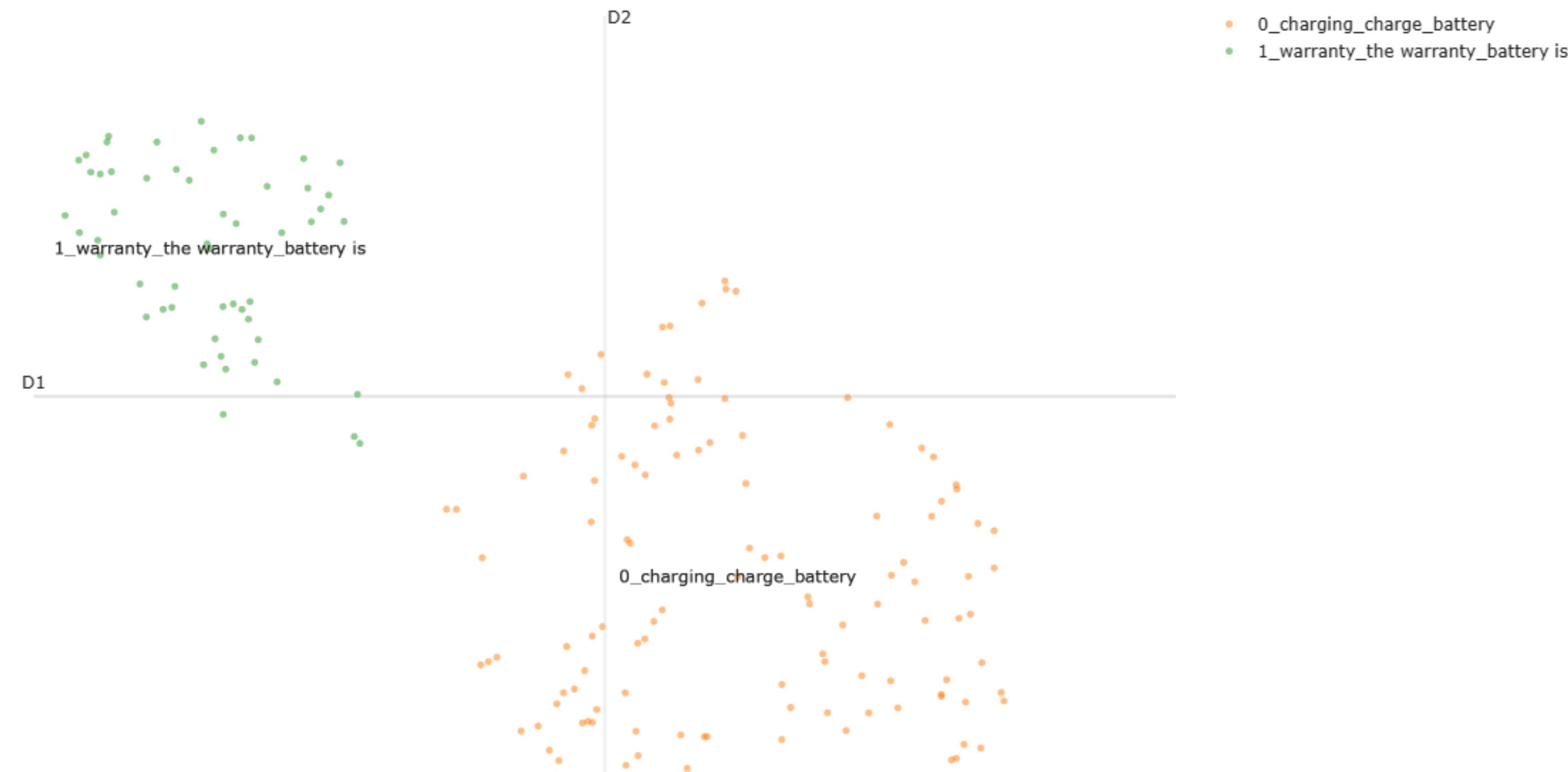
- Service Centre - Poor service experience
  - Battery and charge - Battery and charging related concerns
  - Money - High service costs
  - Repair - Frequent problems with the model

## **Customer Pain Points:**

- Poor response from service centers
  - High service and repair charges
  - Battery and charging system issues

# Customer Segmentation

Documents and Topics



# Customer Segmentation

## Two Main Customer Segments Identified

### **Segment 1: Dissatisfied Customers (Primary Focus Area) (Topic 1)**

- Complain about quality issues with the model
- Poor service center experience
- Negative feedback about after-sales support
- Battery and charging concerns

### **Segment 2: Satisfied Customers (Other Topics)**

- No significant product issues
- Decent service experience
- Praise the model for low maintenance
- Appreciate good mileage and performance

# Strategies to Improve Bajaj Chetak

## Recommended Action Plan:

- 1. Improve Product Quality** – Pay special attention to battery, charging performance and operating system stability.
- 2. Strengthen After-Sales Service** – Enhance service center reliability and focus on customer-first communication to build trust and improve customer satisfaction.

By addressing these areas, Bajaj can improve customer satisfaction, reduce negative reviews, and increase sales through positive word-of-mouth.

# ATHER RIZTA

The Ather Rizta is a family-segment electric scooter from Ather Energy, aimed at blending practicality and smart features for Indian commuters.

## ATHER RIZTA



### Key Features:

- Available in multiple variants including 2.9 kWh and 3.7 kWh battery configurations.
- Equipped with a 4.3 kW Permanent Magnet Synchronous Motor (PMSM), the Rizta claims a top speed of ~80 km/h.
- Features include a 7-inch TFT dashboard (for higher variant), Bluetooth connectivity, navigation, OTA updates, and integrated smart features.
- The Rizta offers a roomy seating layout, wide floorboard, and generous storage (~56 L total with 34 L boot + 22 L trunk).

# Ather Rizta: Basic EDA Results

	date	overall_rating	range_reported
count	48	48.000000	16.000000
mean	2025-03-30 02:00:00	4.054167	99.312500
min	2024-10-03 00:00:00	1.000000	46.000000
25%	2024-12-25 06:00:00	4.000000	83.250000
50%	2025-04-05 00:00:00	4.350000	92.500000
75%	2025-06-26 00:00:00	4.850000	107.500000
max	2025-09-26 00:00:00	5.000000	175.000000
std	NaN	1.157760	32.909408

**Length of Dataset:** 48

## Key Insight:

- At least 75% of users rate the model positively. However, there are also strong negative reviews with ratings  $\leq 2$ .

## Range Interpretation:

- Claimed Range: **151km.**
- Expected real-world range: **46-110 km**  
(Excluding Outliers)

## Review Posting Date:

- Review posting date range from 30-03-2025 to 26-09-2025.

# Visualizations

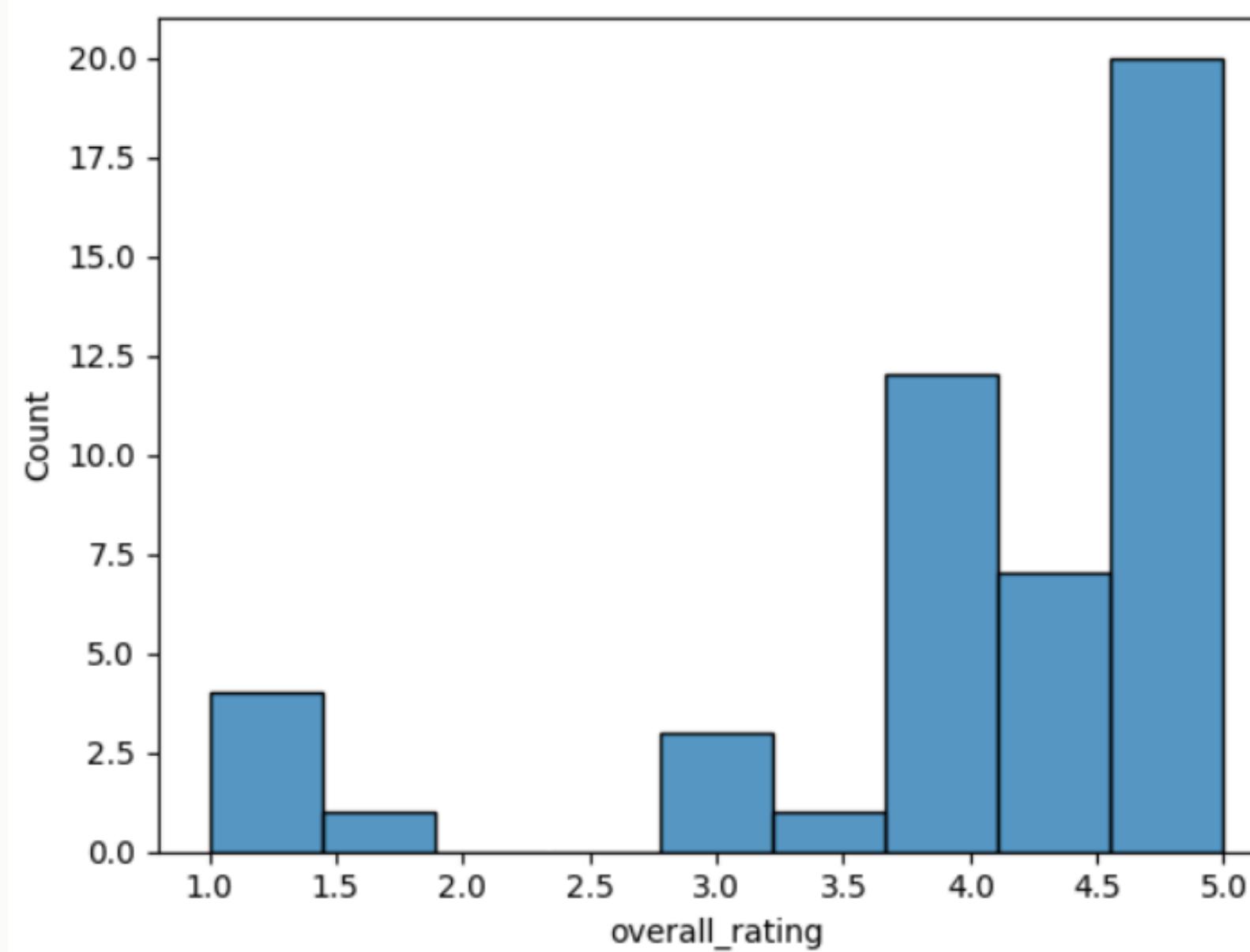


Fig 1. Histogram of Overall Rating Column

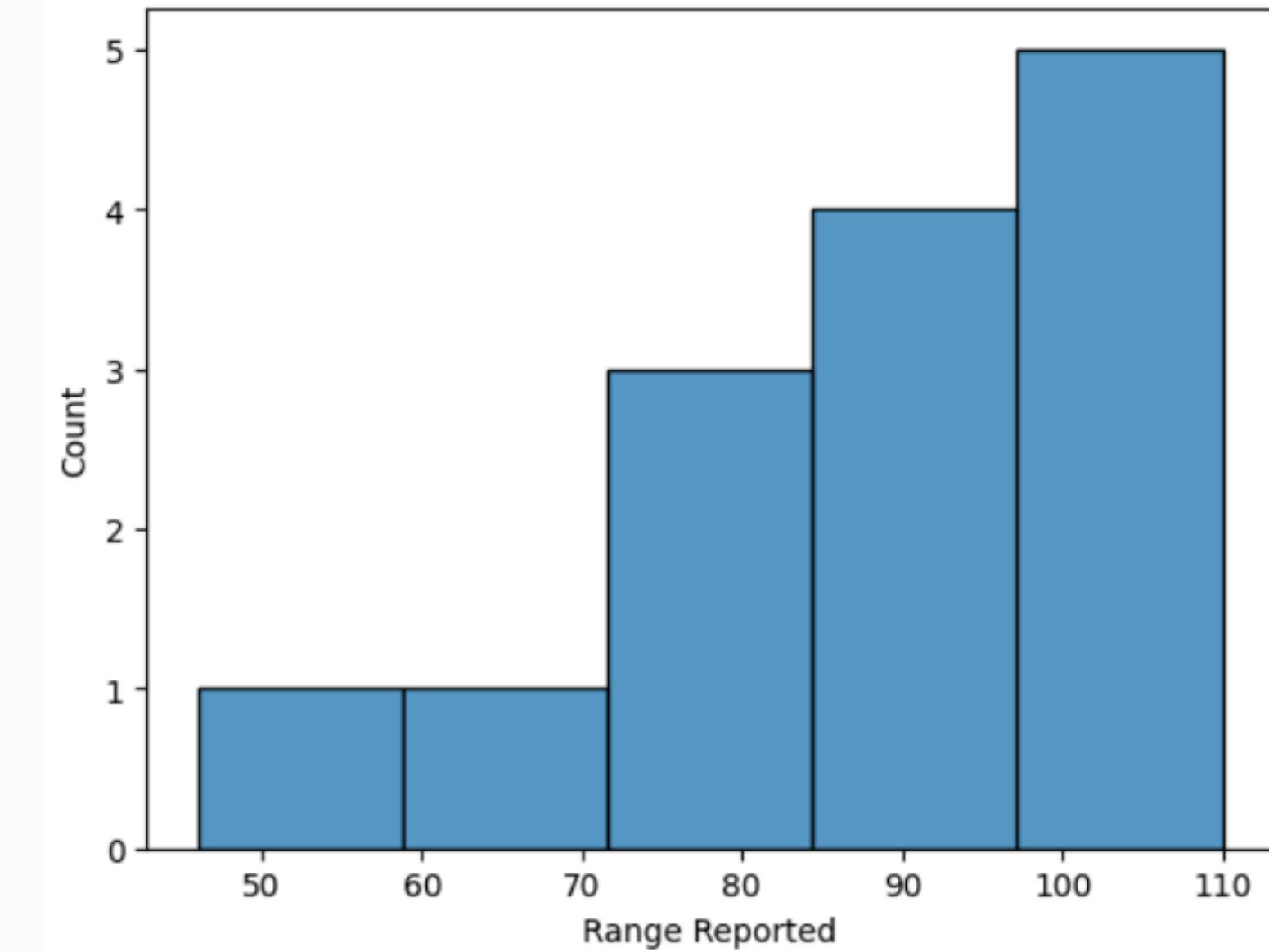
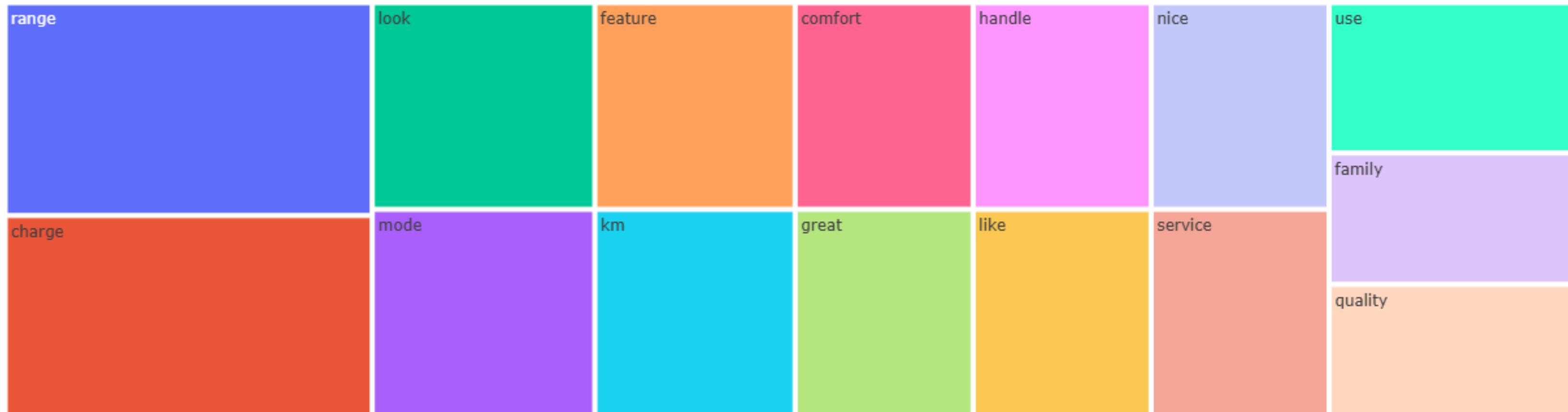


Fig 2. Histogram of Range Reported Column

# Visualizations

Tree of Positive Sentiment Words



**A tree map of frequently occurring words in positive reviews**

# Visualizations

Tree of Negative Sentiment Words



A tree map of frequently occurring words in negative reviews

# Sentiment Analysis Insights

## Positive Reviews



## Positive Reviews - Key Strengths

## Frequently observed positive words:

- Look - Attractive appearance
  - Comfort - Good seating comfort
  - Performance - Reliable driving performance
  - Smooth - Smooth Driving
  - Charge - Fast Charging and Ather Charging Stations

## Customer Appreciation Points

- Attractive design and aesthetics
  - Smooth ride quality
  - Acceptable driving range
  - Fast Charging and Ather Charging Stations

## Negative Reviews



## Negative Reviews - Areas for Improvement

## Frequently observed negative words:

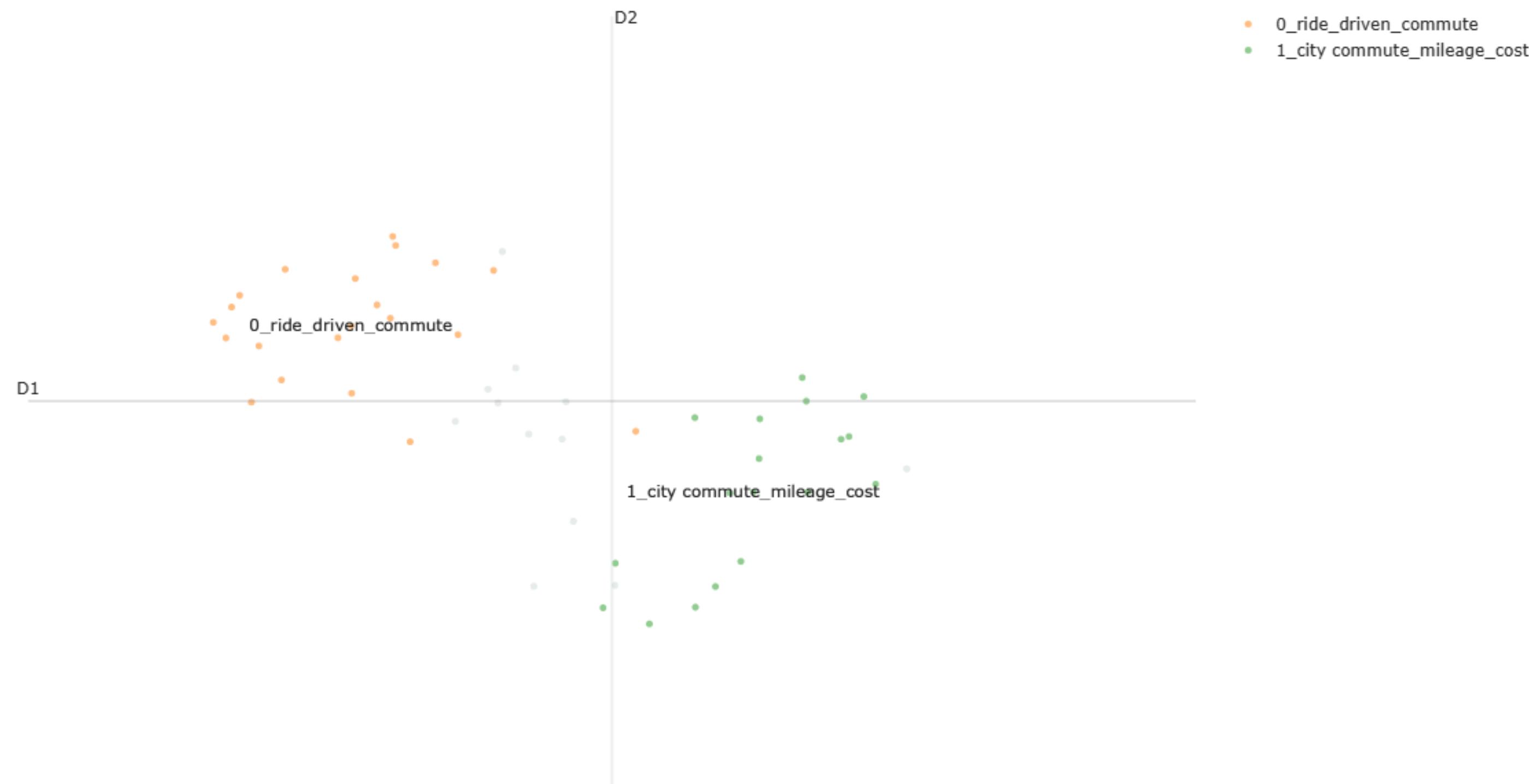
- Service Centre - Poor service experience
  - Response - Slow customer service response
  - Mode - Unsatisfactory performance in echo mode
  - Charge - Charging difficulties
  - Money - High service costs

## **Customer Pain Points:**

- Poor response from service centers
  - Lower-than-expected mileage
  - Unsatisfactory performance in echo mode
  - Minor Product Problems

# Customer Segmentation

**Documents and Topics**



# Customer Segmentation

## Two Main Customer Segments Identified

### Segment 1: Satisfied Customers (All Topics)

- No significant product issues
- Good service experience
- Praise the model for low maintenance
- Appreciate good mileage and performance

### Segment 2: Dissatisfied Customers (Primary Focus Area) (Sparse Reviews)

- Complain about quality issues with the model
- Poor service center experience
- Unsatisfied with real world mileage
- Unsatisfied with performance in eco mode

# Strategies to Improve Ather Rizta

Unlike the other models, customers generally do not raise major concerns regarding battery and performance. However, recurring issues are observed in other areas:

## **Key Issues**

1. Service center experience
2. Minor product-related problems
3. Unrealistic expectations about range
4. Lack of proper understanding about driving modes

## **Suggestions**

1. Provide clear communication about the different driving modes and their impact on performance.
2. Set realistic range expectations for consumers based on real-world conditions.
3. Enhance the after-sales service experience through better technician training and improved customer support.

By addressing these aspects, Ather can strengthen customer trust and satisfaction, ensuring long-term adoption in the competitive EV market.

# OLA S1X



The Ola S1X is a compact electric scooter from Ola Electric, designed to offer efficient urban mobility with smart features and multiple variants suited to varying range and performance needs.

## **Key Features & Specifications:**

- Multiple variants offering different battery capacities and ranges, e.g. up to 108 km for base variant
- Motor: 5.5 kW rated power, with a peak output up to ~7 kW
- Top speed: up to 101 km/h in the 2 kWh variant
- Charging: approx. 5 hours from 0–100% in base variant
- Smart features: app connectivity, ride modes (Eco / Normal / Sport), real-time battery status, digital instrumentation

# Ola S1X: Basic EDA Results

**Length of Dataset:** 103

	date	overall_rating	range_reported
count	103	103.000000	11.000000
mean	2025-06-03 15:50:40.776699136	4.432039	154.181818
min	2025-02-05 00:00:00	1.000000	54.000000
25%	2025-04-14 00:00:00	4.300000	98.500000
50%	2025-06-03 00:00:00	4.700000	128.000000
75%	2025-07-21 12:00:00	5.000000	167.500000
max	2025-09-23 00:00:00	5.000000	500.000000
std	Nan	0.889064	121.387659

## Key Insight:

- At least 75% of users rate the model positively. However, there are also strong negative reviews with ratings  $\leq 2$ .

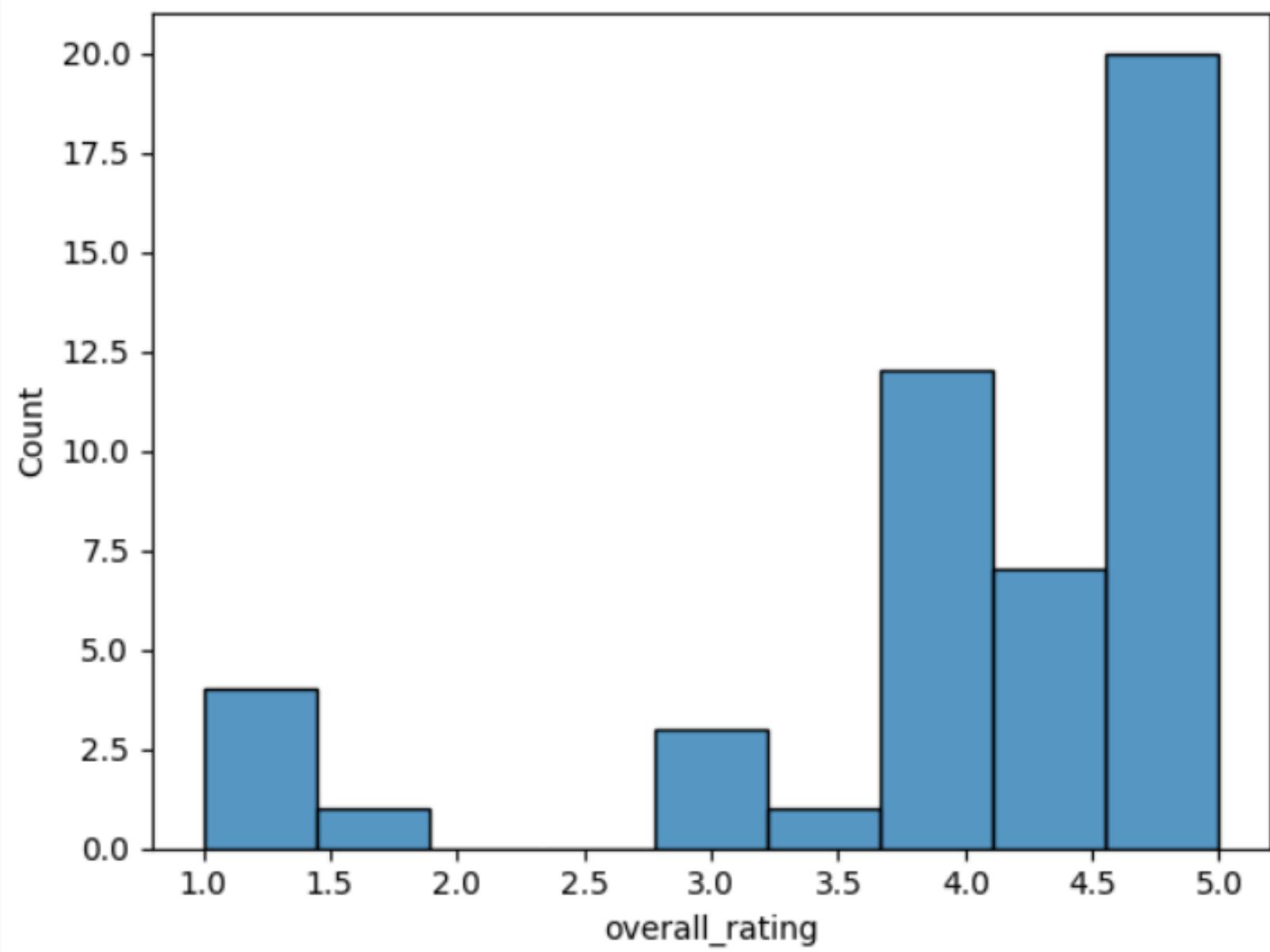
## Range Interpretation by Model Variant:

- Claimed Range: **108 - 242 km** (Range change according to variants).
- Expected real-world range: **54 - 176 km.** (Excluding Outliers)

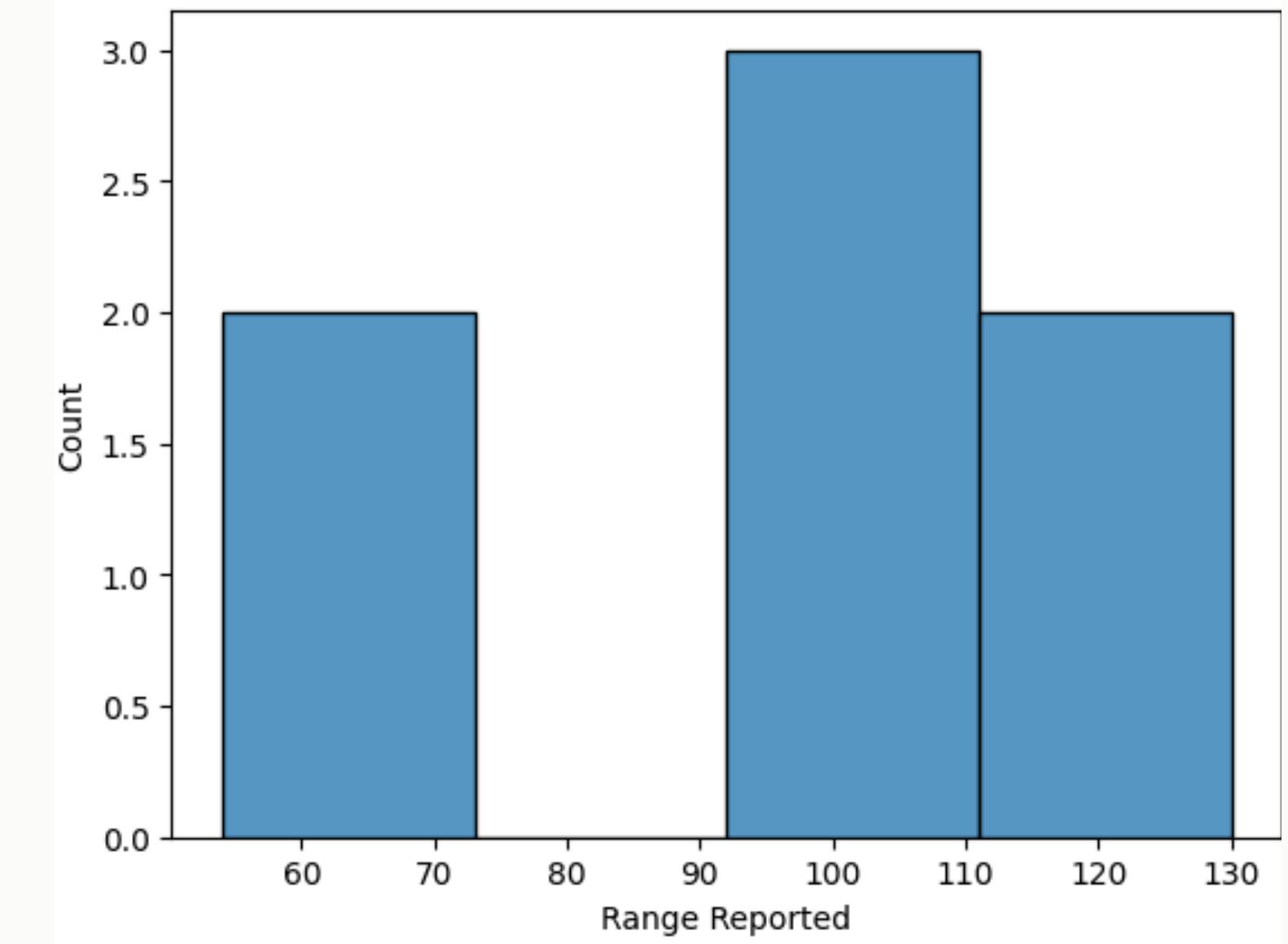
## Review Posting Date:

- Review posting date range from 05-02-2025 to 23-09-2025.

# Visualizations



**Histogram of Overall Rating Column**



**Histogram of Range Reported Column**

# Visualizations

Tree of Positive Sentiment Words



**A tree map of frequently occurring words in positive reviews**

# Visualizations

Tree of Negative Sentiment Words



A tree map of frequently occurring words in negative reviews

# Sentiment Analysis Insights



## Positive Reviews - Key Strengths

## Frequently observed positive words:

- Look - Attractive appearance
  - Comfort - Good seating comfort
  - Performance - Reliable driving performance
  - Smooth - Smooth Driving
  - Range - Satisfactory driving range

## **Customer Appreciation Points:**

- Attractive design and aesthetics
  - Smooth ride quality
  - Acceptable driving range

## Negative Reviews - Areas for Improvement

## Frequently observed negative words:

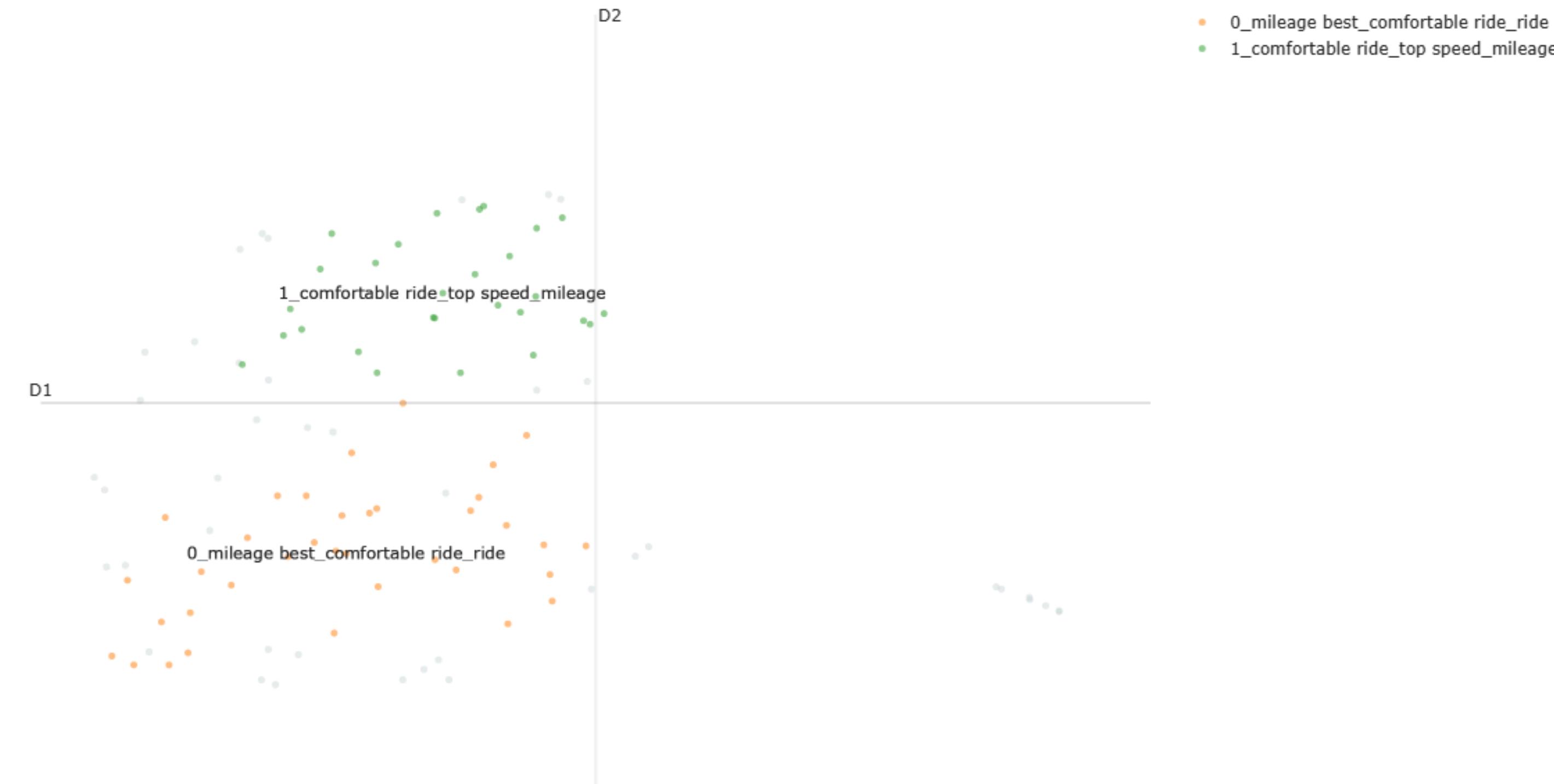
- Money - High service costs
  - Service Highly - Indicating High service cost

## **Customer Pain Points:**

- Poor response from service centers
  - High Service and maintenance cost
  - Other Product Related Problems

# Customer Segmentation

## Documents and Topics



# Customer Segmentation

## Two Main Customer Segments Identified

### Segment 1: Satisfied Customers (All Topics)

- No significant product issues
- Good service experience
- Praise the model for low maintenance
- Appreciate good mileage and performance

### Segment 2: Dissatisfied Customers (Primary Focus Area) (Sparse Reviews)

- Complain about quality issues with the model
- Poor service center experience and high service, maintenance cost

# Strategies to Improve Ola S1X

This conclusion has been made based on latest reviews in which we can see high no of positive reviews. Customers, generally do not raise major concerns regarding product. However, recurring issues are observed in other areas:

## **Key Issues**

1. Service center experience
2. Minor product-related problems

## **Suggestions**

1. Maintain Product Momentum – Continue refining range and performance to sustain positive customer sentiment.
2. Resolve Service Center Issues and Product Problems – Invest in after-sales support infrastructure, technician training, and customer communication to align service quality with product quality.

While Ola's recent improvements have earned strong positive sentiment, addressing service-related concerns is essential to ensure long-term customer satisfaction and brand loyalty.

# Conclusion

Currently, EV Scooters hold a market share of around 6-7% in overall two wheeler sales, which shows strong adoption. However, for the industry to move further ahead, companies need to focus on improving product reliability and after-sales support.

## **Key areas of improvement include:**

1. Training staff to handle product issues more effectively.
2. Enhancing after-sales experience, especially addressing service center concerns.

## **Better communication during sales, where salespersons should clearly explain:**

1. Real-world range expectations.
2. Driving modes and their impact on performance and battery life.
3. Transparent details about model specifications.

If EV companies work on these critical areas, we can expect electric vehicles to capture an even larger market share than petrol vehicles in the near future.

**THANK YOU!!**

