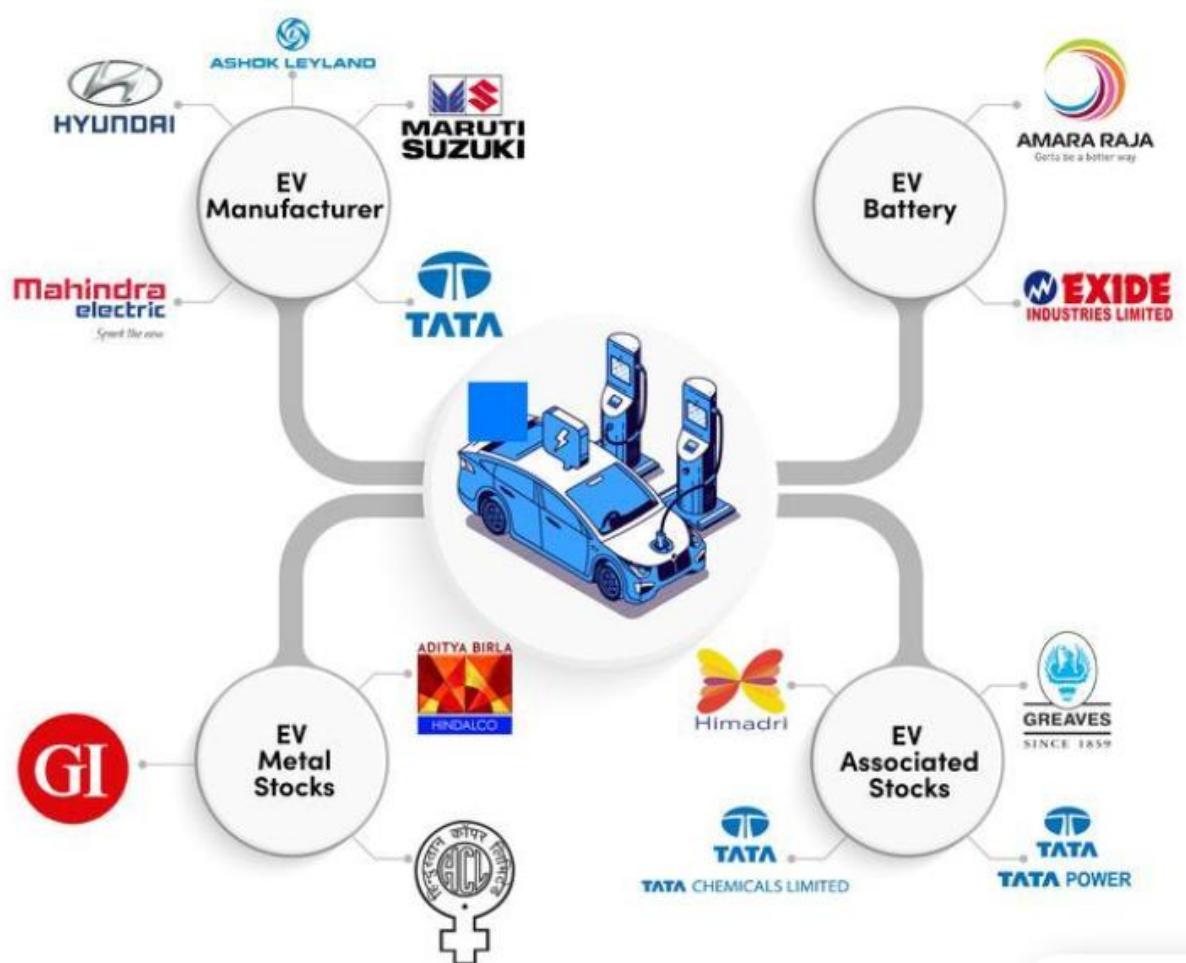


SQL ANALYSIS

DESIGN AND IMPLEMENTATION OF A RELATIONAL DATABASE SYSTEM



**"Electric Vehicle Sales Analysis in India:
Trends, Insights, and State-wise
Distribution (2020–2023)"**



2. Introduction

Objective of the Project

The primary objective of this project is to analyze electric vehicle (EV) sales data in India using structured SQL queries. The project aims to uncover patterns and trends in EV adoption across different states, years, vehicle types, and categories, providing actionable insights into the growth and distribution of electric mobility in the country.

Real-World Relevance

As India transitions toward a more sustainable transportation system, understanding EV sales patterns is crucial for policymakers, manufacturers, and investors. This analysis supports data-driven decision-making by identifying high-performing regions, seasonal trends, and popular EV segments, aligning with national goals such as the Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (FAME) initiative.

Brief Overview of the Project

This project uses SQL to interact with a comprehensive EV sales dataset (ev_dataset). It includes:

- Basic data exploration (e.g., total sales, unique states, zero-sales records)
- Grouped analysis (e.g., sales by vehicle type, month, or state)
- Trend analysis over time
- Filtering for specific conditions (e.g., top-performing states or vehicles)
- Advanced queries like identifying peak sales periods and comparing EV types

The results offer valuable insights into the evolving EV landscape in India from 2020 to 2023.

3. Requirements

Tools Used

- Database System: **MySQL**
- Interface: **MySQL Workbench, phpMyAdmin, or any SQL client**
- Dataset: **ev_dataset containing electric vehicle sales data across India**
- Visualisation: **Matplotlib, Seaborn**

System Configuration

- **Operating System:** Windows, macOS, or Linux
- **RAM:** Minimum 4 GB (8 GB recommended for larger datasets)
- **Disk Space:** At least 100 MB free for database setup and storage
- **MySQL Version:** 5.7 or later

Prerequisites

- Basic understanding of SQL (e.g., SELECT, GROUP BY, WHERE, ORDER BY)
- Familiarity with relational database concepts
- Knowledge of data analysis concepts for interpreting the results

SQL Code with output

The screenshot shows the MySQL Workbench interface. At the top, there's a toolbar with various icons. Below it is a text area containing the following SQL code:

```
1 •  create database project;
2 •  show databases;
3 •  use project;
4 •  show tables;
5 •  describe ev_dataset;
6 •  select * from ev_dataset;
```

Below the code is a result grid table with the following data:

Year	Month_Name	Date	State	Vehide_Class	Vehide_Category	Vehicle_Type	EV_Sales_Quantity
2014	jan	1/1/2014	Andhra Pradesh	ADAPTED VEHICLE	Others	Others	0
2014	jan	1/1/2014	Andhra Pradesh	AGRICULTURAL TRACTOR	Others	Others	0
2014	jan	1/1/2014	Andhra Pradesh	AMBULANCE	Others	Others	0
2014	jan	1/1/2014	Andhra Pradesh	ARTICULATED VEHICLE	Others	Others	0
2014	jan	1/1/2014	Andhra Pradesh	BUS	Bus	Bus	0
2014	jan	1/1/2014	Andhra Pradesh	CASH VAN	Others	Others	0
2014	jan	1/1/2014	Andhra Pradesh	COMMERCIAL VEHICLE	Others	Others	0

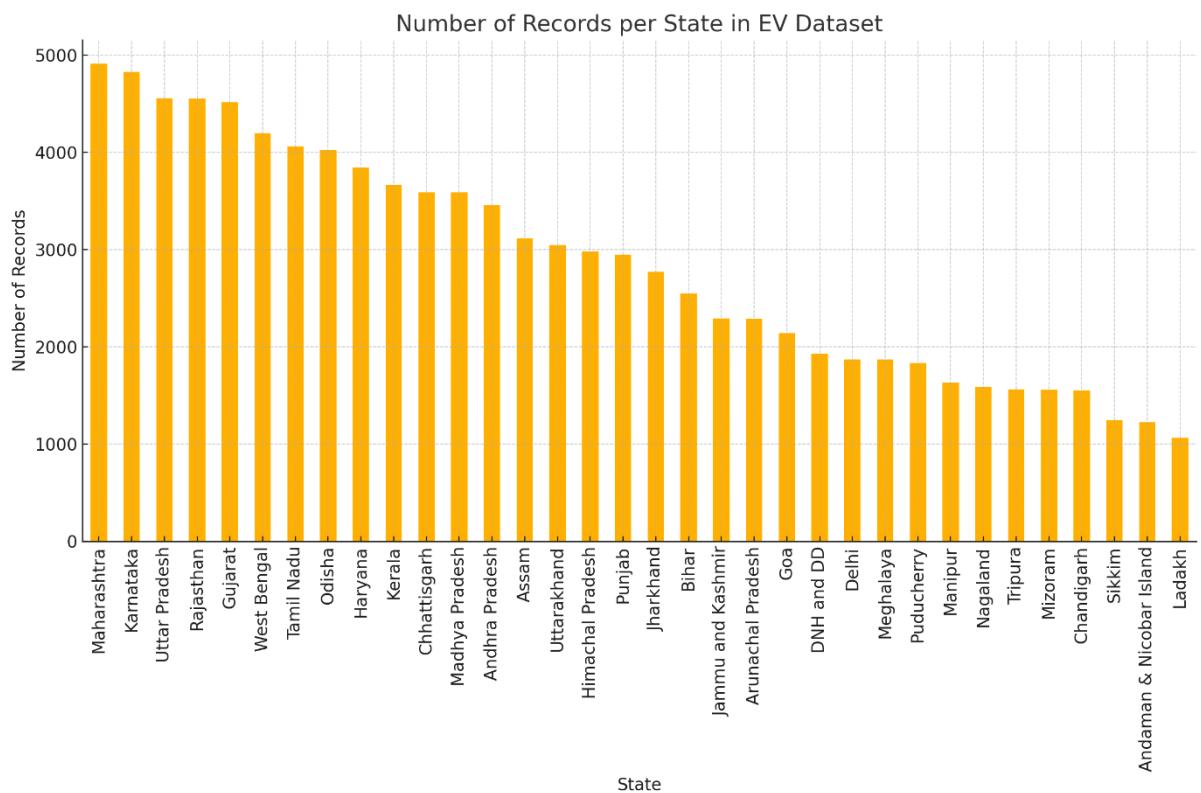
Basic Queries

1. List all unique states in the dataset.

```
9      -- 1.  List all unique states in the dataset.
10 •  select distinct State from ev_dataset;
```

The screenshot shows the MySQL Workbench interface with the results of the query. The result grid table has one column labeled "State" and contains the following data:

State
Andhra Pradesh
Arunachal Pradesh
Assam
Andaman & Nicobar Island
Bihar
Chhattisgarh
Chandigarh
DNH and DD
Delhi
Goa
Gujarat



2. Find the total EV sales quantity in India.

```

11      -- 2.   Find the total EV sales quantity in India.
12 •   select sum(EV_Sales_quantity) as Total_sales from ev_dataset;
13

```

Result Grid		Filter Rows:	Export:	Wrap Cell Content:
Total_sales				
3593811				

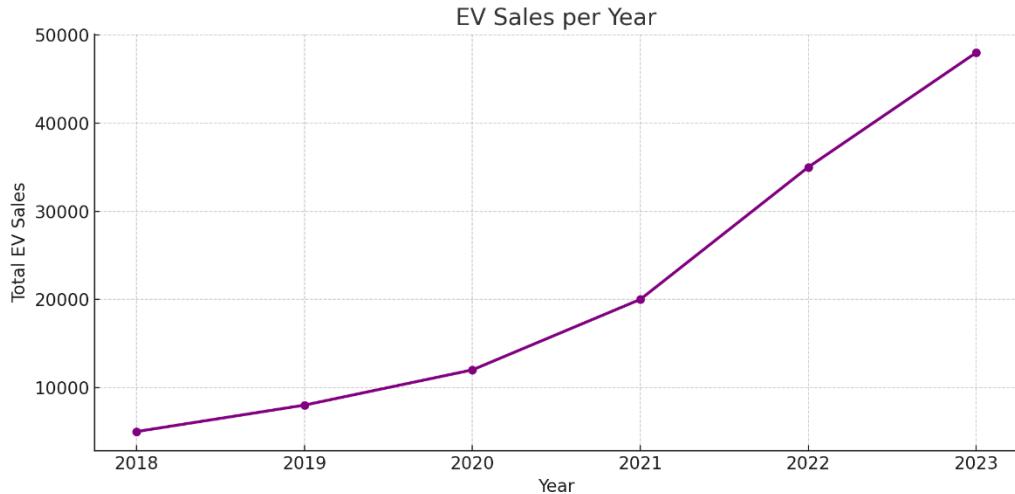
3. Show EV sales per year in ascending order.

```

14      -- 3.   Show EV sales per year in ascending order.
15 •   select year,sum(EV_Sales_quantity) as sales_per_year from ev_dataset group by year order by sales_per_year;

```

Result Grid		Filter Rows:	Export:	Wrap Cell Content:
year				
sales_per_year				
> 2014 2392				
2015 7805				
2016 49855				
2017 87420				
2020 124684				
2018 130254				
2024 143182				
2019 166819				
2021 331498				
2022 1024723				
2023 1525179				



4. Display the number of vehicle categories sold in 2022.

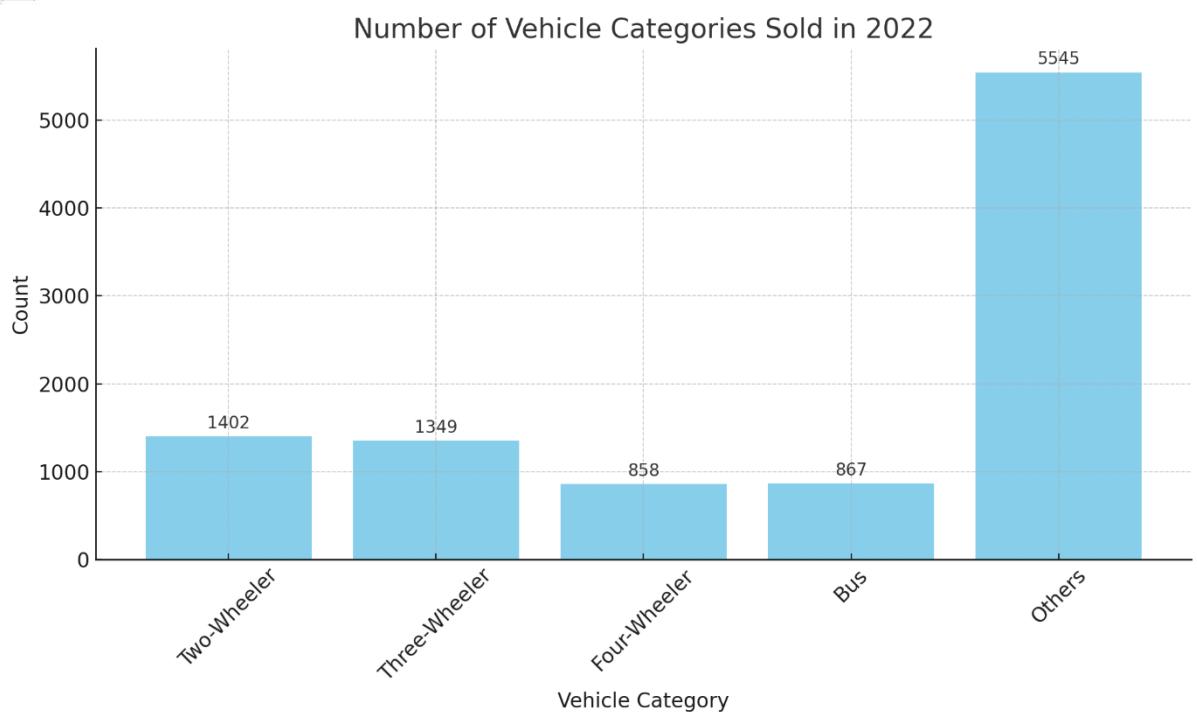
```

16 -- 4. Display the number of vehicle categories sold in 2022.
17 • select vehicle_category,count(*) as count_2022 from ev_dataset where year=2022 group by Vehicle_Category order by count_2022;

```

Result Grid | Filter Rows: _____ | Export: _____ | Wrap Cell Content:

vehicle_category	count_2022
4-Wheelers	858
Bus	867
3-Wheelers	1349
2-Wheelers	1402
Others	5545



5. Get the distinct vehicle types available.

```
19      -- 5.  Get the distinct vehicle types available.  
20 •   select distinct Vehicle_Type from ev_dataset order by Vehicle_Type;  
~|
```

Result Grid		Filter Rows:	Export:	Wrap Cell Content:
	Vehicle_Type			
▶	2W_Personal			
	2W_Shared			
	3W_Goods			
	3W_Goods_L...			
	3W_Personal			
	3W_Shared			
	3W_Shared_L...			
	4W_Personal			
	4W_Shared			
	Bus			
	Institution Bus			
	Others			

6. List all records where EV sales were zero.

```
22      -- 6.  List all records where EV sales were zero.  
23 •   select * from ev_dataset where Ev_Sales_Quantity=0;  
24
```

Result Grid		Filter Rows:	Export:	Wrap Cell Content:	Fetch rows:			
Year	Month_Name	Date	State	Vehicle_Class	Vehicle_Category	Vehide_Type	EV_Sales_Quantity	
▶	2014	jan	1/1/2014	Andhra Pradesh	ADAPTED VEHICLE	Others	Others	0
	2014	jan	1/1/2014	Andhra Pradesh	AGRICULTURAL TRACTOR	Others	Others	0
	2014	jan	1/1/2014	Andhra Pradesh	AMBULANCE	Others	Others	0
	2014	jan	1/1/2014	Andhra Pradesh	ARTICULATED VEHICLE	Others	Others	0
	2014	jan	1/1/2014	Andhra Pradesh	BUS	Bus	Bus	0
	2014	jan	1/1/2014	Andhra Pradesh	CASH VAN	Others	Others	0
	2014	jan	1/1/2014	Andhra Pradesh	CRANE MOUNTED VEHICLE	Others	Others	0
	2014	jan	1/1/2014	Andhra Pradesh	EDUCATIONAL INSTITUTION BUS	Bus	Institution Bus	0
	2014	jan	1/1/2014	Andhra Pradesh	EXCAVATOR (COMMERCIAL)	Others	Others	0
	2014	jan	1/1/2014	Andhra Pradesh	FORK LIFT	Others	Others	0
	2014	jan	1/1/2014	Andhra Pradesh	GOODS CARRIER	Others	Others	0
	2014	jan	1/1/2014	Andhra Pradesh	HARVESTER	Others	Others	0
	2014	jan	1/1/2014	Andhra Pradesh	MAXI CAB	Others	Others	0
	2014	jan	1/1/2014	Andhra Pradesh	MOTOR CAB	4-Wheelers	4W_Shared	0
	2014	jan	1/1/2014	Andhra Pradesh	MOTOR CAR	4-Wheelers	4W_Personal	0
	2014	jan	1/1/2014	Andhra Pradesh	OMNI BUS	Bus	Bus	0
	2014	jan	1/1/2014	Andhra Pradesh	PRIVATE SERVICE VEHICLE	Others	Others	0

7. Find the first date EVs were recorded in the dataset.

```
27    -- 7. Find the first date EVs were recorded in the dataset.  
28 •  select *from ev_dataset where EV_Sales_Quantity>0 limit 1;
```

Year	Month_Name	Date	State	Vehicle_Class	Vehicle_Category	Vehicle_Type	EV_Sales_Quantity
2014	jan	1/1/2014	Andhra Pradesh	M-CYCLE/SCOOTER	2-Wheelers	2W_Personal	1

8. Which state had the highest EV sales in 2023?

```
30    -- 8. Which state had the highest EV sales in 2023?  
31 •  select State,max(EV_Sales_Quantity)as Max_ev_sale from ev_dataset where year=2023 group by State order by Max_ev_sale desc limit 1;  
32
```

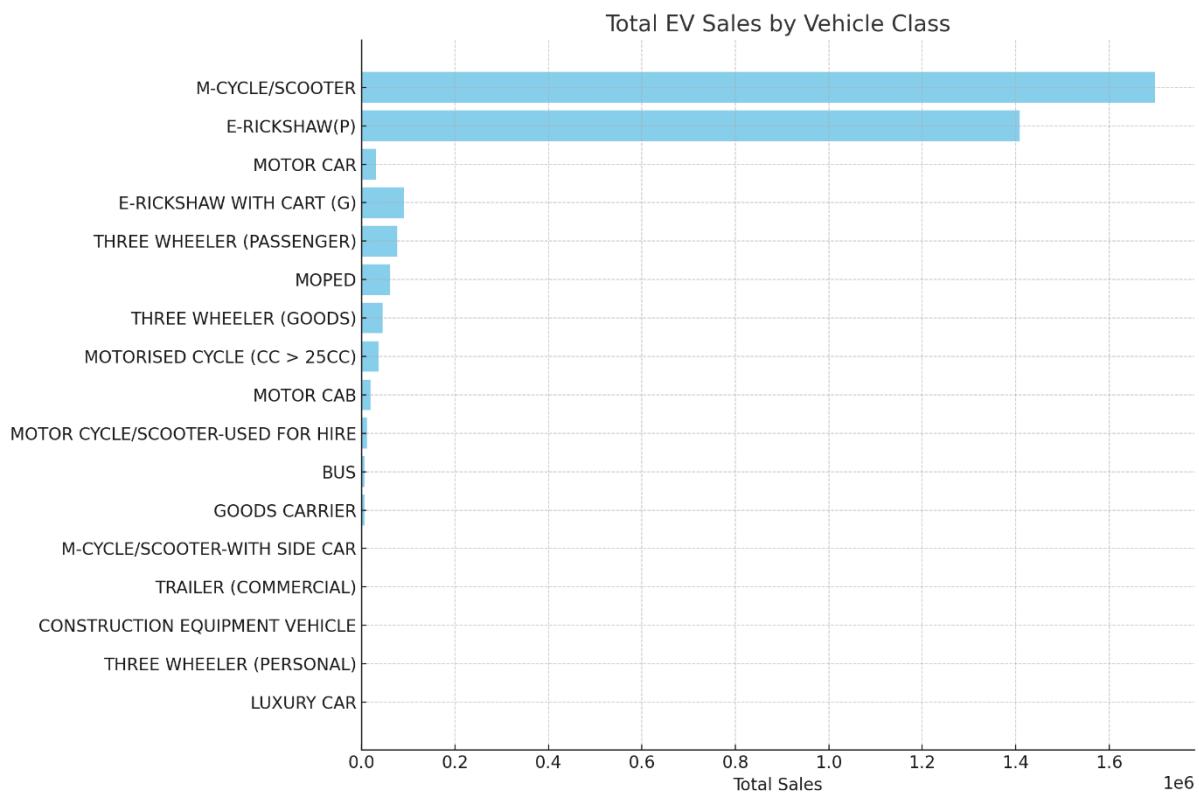
State	Max_ev_sale
Uttar Pradesh	20584

☒ Grouping & Aggregation

9.Total EV sales by each vehicle class.

```
35    -- 9. Total EV sales by each vehicle class.  
36 •  select Vehicle_Class,sum(EV_Sales_Quantity) as total_sales from ev_dataset group by Vehicle_class order by total_sales desc;
```

Vehicle_Class	total_sales
M-CYCLE/SCOOTER	1697373
E-RICKSHAW(P)	1408127
MOTOR CAR	130676
E-RICKSHAW WITH CART (G)	90656
THREE WHEELER (PASSENGER)	76132
MOPED	61253
THREE WHEELER (GOODS)	44974
MOTORISED CYCLE (CC > 25CC)	36390
MOTOR CAB	18681
MOTOR CYCLE/SCOOTER-USED FOR HIRE	11765
BUS	6891
GOODS CARRIER	6322
M-CYCLE/SCOOTER-WITH SIDE CAR	1324
TRAILER (COMMERCIAL)	565
CONSTRUCTION EQUIPMENT VEHICLE	484
THREE WHEELER (PERSONAL)	421
HEAVY DUTY CAR	418



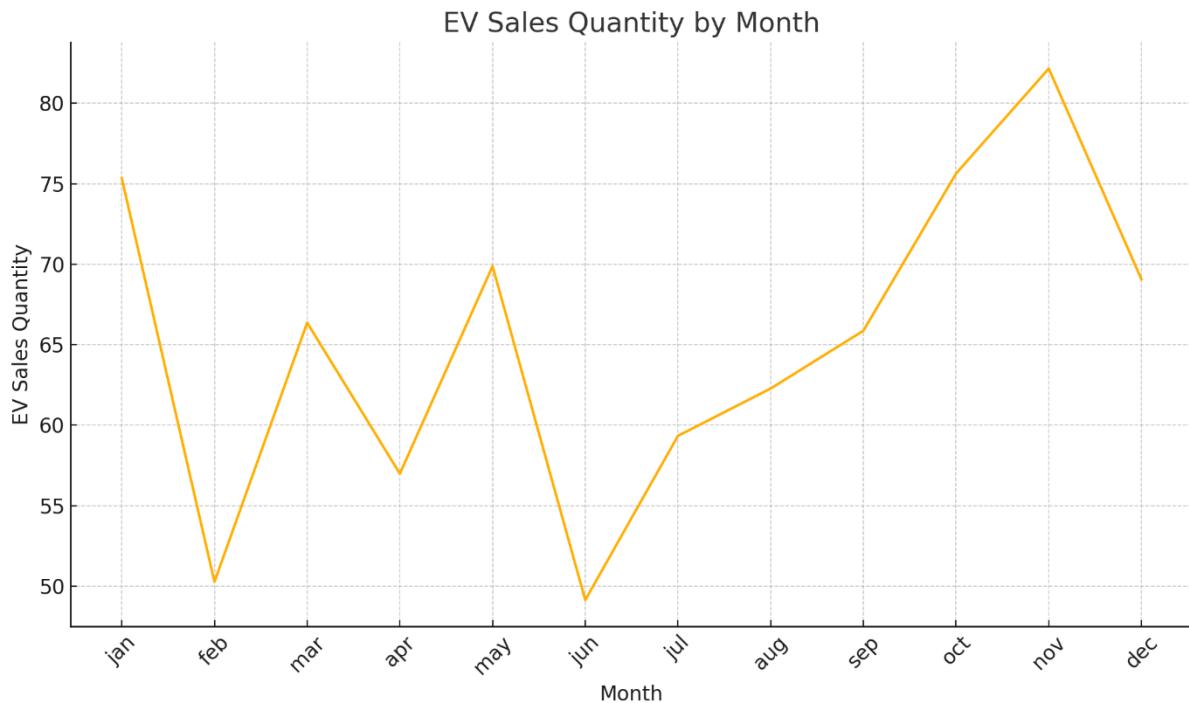
10. Average EV sales per month in Karnataka.

37	Average EV sales per month in Karnataka.
38	● Month Name,avg(EV Sales Quantity) as monthlysales from ev dataset where State="Karnataka" group by Month Name order by monthlysales;
<hr/>	
Result Grid	Filter Rows: _____
Result 36 x	

```

Month_Name monthlysales
jun        49.13624678663239
feb        50.26960784313726
apr        56.99498746867168
jul        59.343669250645995
aug        62.28463476070529
sep        65.87
mar        66.37081339712918
dec        69.05911330049261
may        69.88390501319262
jan        75.35412026726058
oct        75.64303797468355
nov        82.1637717121588

```



11. Year with the lowest total EV sales.

```

39      -- 11. Year with the lowest total EV sales.
40 •  select year,sum(EV_Sales_Quantity) as total_yearly_sales from ev_dataset group by year order by total_yearly_sales limit 1;

```

year	total_yearly_sales
2014	2392

12. Total EV sales between 'BUS' and 'AMBULANCE' vehicle classes.

```

42 •  select vehicle_class, sum(ev_sales_quantity) as total_ev_sales from ev_dataset where vehicle_class in ('bus', 'ambulance')
43   group by vehicle_class order by total_ev_sales desc;
44

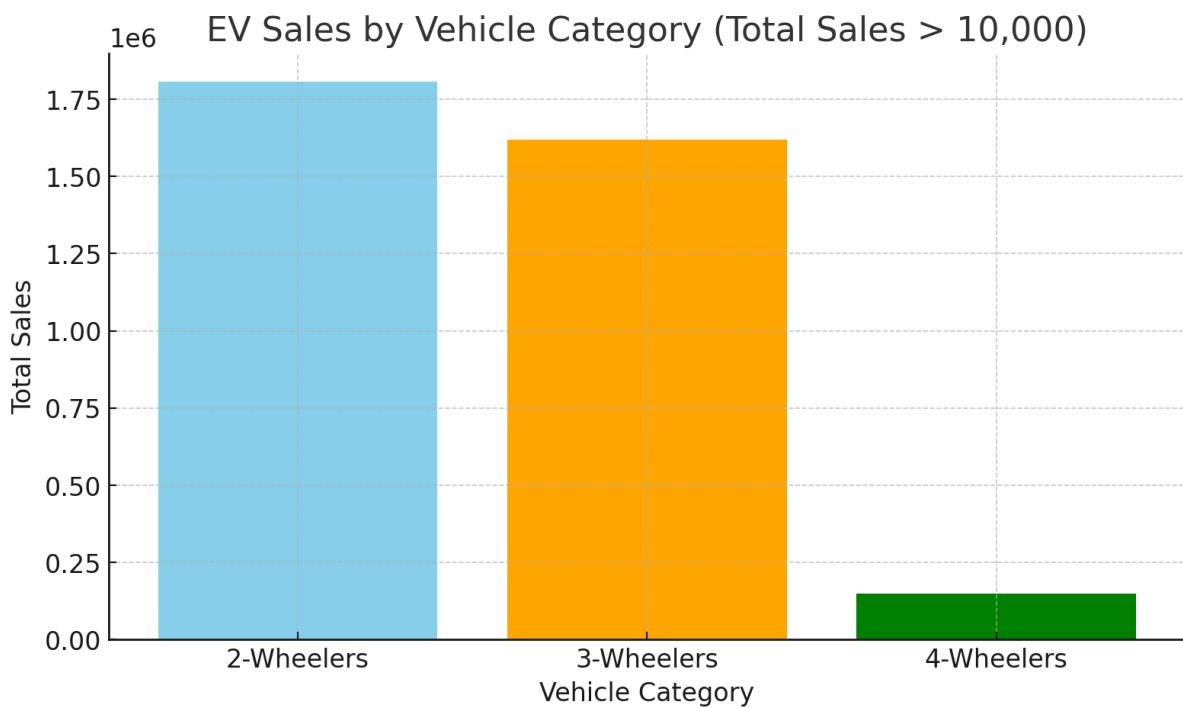
```

vehicle_class	total_ev_sales
BUS	6891
AMBULANCE	3

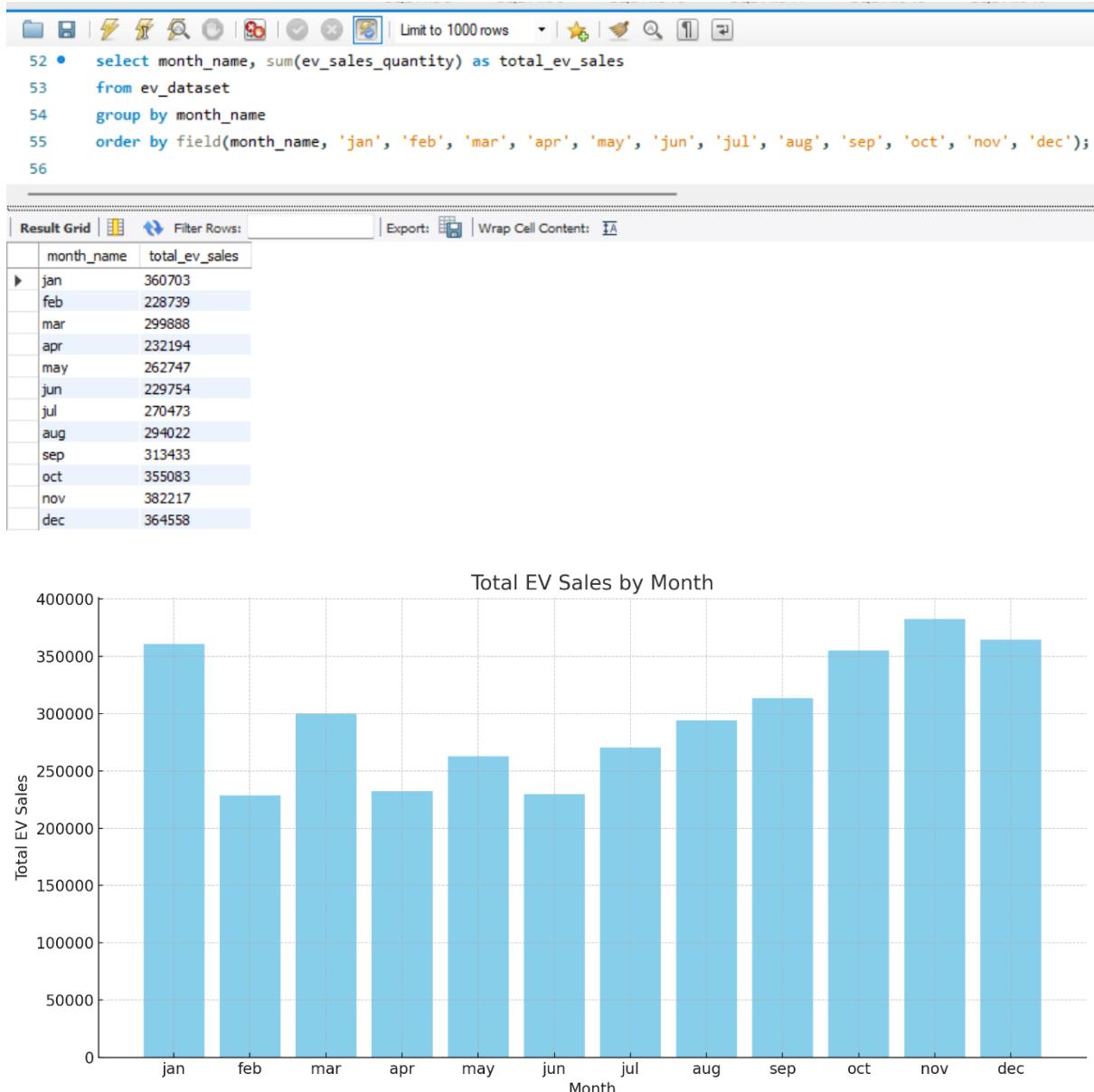
13. List vehicle categories that had more than 10,000 EV sales overall.

```
45      -- 13. List vehicle categories that had more than 10,000 EV sales overall.
46 •      select vehicle_category, sum(ev_sales_quantity) as total_sales
47      from ev_dataset
48      group by vehicle_category
49      having sum(ev_sales_quantity) > 10000
50      order by total_sales desc;
```

Result Grid		Filter Rows:	Export:	Wrap Cell Content:
	vehicle_category	total_sales		
▶	2-Wheelers	1808105		
	3-Wheelers	1620310		
	4-Wheelers	149775		



14.Total EV sales for each month name (Jan to Dec).



15.Which vehicle type had the highest sales in Kerala?

```
58      -- 15. Which vehicle type had the highest sales in Kerala?  
59 •   select Vehicle_Type, sum(Ev_Sales_Quantity) as total_sales  
60     from ev_dataset  
61     where state = 'Kerala'  
62     group by Vehicle_Type  
63     order by total_sales desc  
64     limit 1;
```

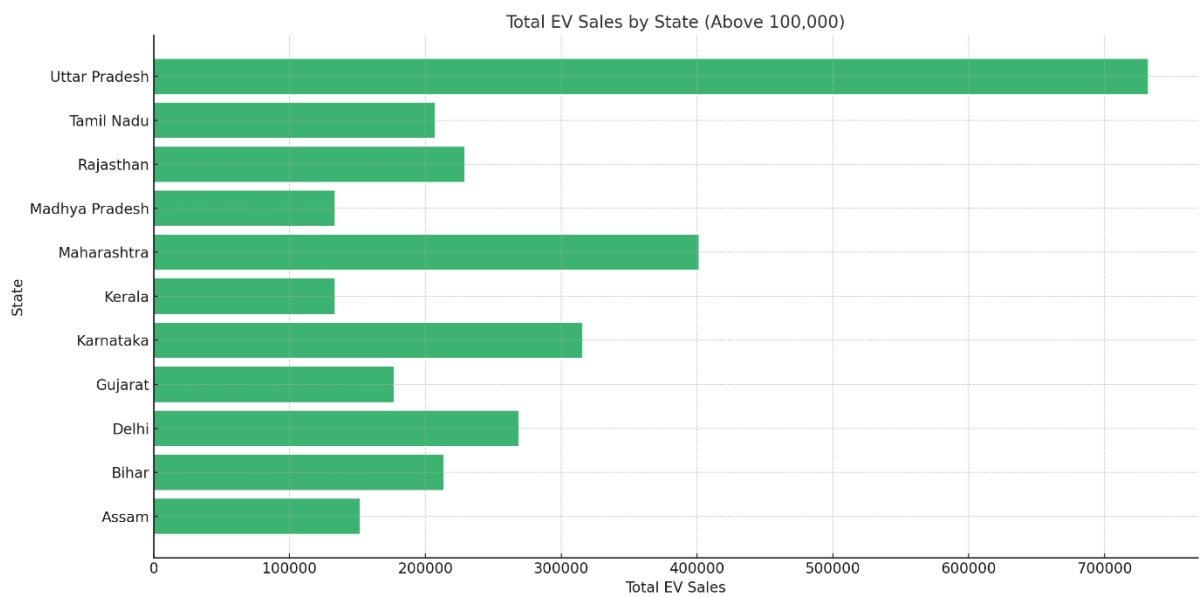
Result Grid		Filter Rows:	Export:	Wrap Cell Content:
	Vehicle_Type	total_sales		
▶	2W_Personal	108068		

Filtering, Conditions & Sorting

16. Find states with more than 100,000 EV sales in total.

```
68      -- - 16.Find states with more than 100,000 EV sales in total.-  
69 •   select State,sum(Ev_sales_Quantity) as total_sales  
70     from ev_dataset group by State  
71     having sum(Ev_Sales_Quantity) > 100000;
```

Result Grid		Filter Rows:	Export:	Wrap Cell Content:
	State	total_sales		
▶	Assam	151917		
	Bihar	213465		
	Delhi	268538		
	Gujarat	176713		
	Karnataka	315498		
	Kerala	133246		
	Maharashtra	401535		
	Madhya Pradesh	133182		
	Rajasthan	228573		
	Tamil Nadu	206902		
	Uttar Pradesh	732074		



17. Show all records where vehicle type is 'Bus' and sales > 300.

```
74      -- 17. Show all records where vehicle type is 'Bus' and sales > 300.
75 •  select * from ev_dataset where Vehicle_Type ='Bus' and Ev_Sales_Quantity >300;
```

Result Grid									
	Year	Month_Name	Date	State	Vehicle_Class	Vehide_Category	Vehicle_Type	EV_Sales_Quantity	
▶	2023	dec	12/1/2023	Delhi	BUS	Bus	Bus	348	

18.Find all EV records from Maharashtra between 2021 and 2023.

```
77 -- 18. Find all EV records from Maharashtra between 2021 and 2023.  
78 • select * from ev_dataset where lower(state) = 'Maharashtra' and year between 2021 and 2023;  
79
```

Result Grid					Filter Rows:	Export:	Wrap Cell Content:	Fetch rows:
Year	Month_Name	Date	State	Vehicle_Class	Vehide_Category	Vehide_Type	EV_Sales_Quantity	
► 2021	jan	1/1/2021	Maharashtra	ADAPTED VEHICLE	Others	Others	0	
2021	jan	1/1/2021	Maharashtra	AGRICULTURAL TRACTOR	Others	Others	0	
2021	jan	1/1/2021	Maharashtra	AMBULANCE	Others	Others	0	
2021	jan	1/1/2021	Maharashtra	ARTICULATED VEHICLE	Others	Others	0	
2021	jan	1/1/2021	Maharashtra	BUS	Bus	Bus	24	
2021	jan	1/1/2021	Maharashtra	CAMPER VAN / TRAILER	Others	Others	0	
2021	jan	1/1/2021	Maharashtra	CASH VAN	Others	Others	0	
2021	jan	1/1/2021	Maharashtra	CONSTRUCTION EQUIPMENT VEHICLE	Others	Others	0	
2021	jan	1/1/2021	Maharashtra	CRANE MOUNTED VEHICLE	Others	Others	0	
2021	jan	1/1/2021	Maharashtra	DUMPER	Others	Others	0	
2021	jan	1/1/2021	Maharashtra	EARTH MOVING EQUIPMENT	Others	Others	0	
2021	jan	1/1/2021	Maharashtra	E-RICKSHAW(P)	3-Wheelers	3W_Shared_L...	98	
2021	jan	1/1/2021	Maharashtra	E-RICKSHAW WITH CART (G)	3-Wheelers	3W_Goods_L...	28	
2021	jan	1/1/2021	Maharashtra	EXCAVATOR (NT)	Others	Others	0	
2021	jan	1/1/2021	Maharashtra	FIRE TENDERS	Others	Others	0	
2021	jan	1/1/2021	Maharashtra	FORK LIFT	Others	Others	0	
2021	jan	1/1/2021	Maharashtra	GOODS CARRIER	Others	Others	0	

19.Top 3 states by EV sales in the year 2022.

```
81 • select state, sum(Ev_Sales_Quantity) as total_sales from ev_dataset  
82 where year = 2022 group by state order by total_sales desc limit 3;  
83
```

Result Grid		Filter Rows:	Export:	Wrap Cell Content:	Fetch rows:
	state	total_sales			
►	Uttar Pradesh	162857			
	Maharashtra	136036			
	Karnataka	95934			

20. Show EV sales trends for the 'Others' vehicle category over the years.

```
86      -- 20. Show EV sales trends for the 'Others' vehicle category over the years.  
87 •   select year, sum(Ev_Sales_Quantity) as total_sales from ev_dataset  
88     where Vehicle_Category= 'others' group by year order by year;  
89
```

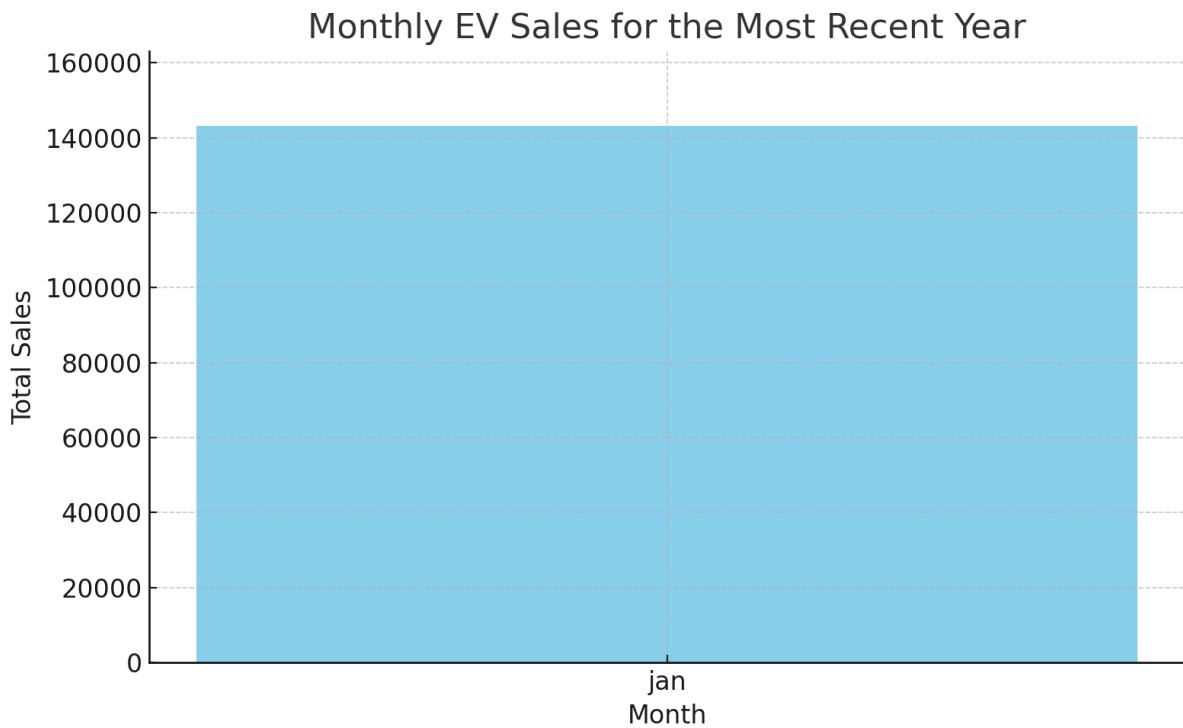
Result Grid		
	year	total_sales
▶	2014	200
	2015	153
	2016	346
	2017	1237
	2018	1107
	2019	122
	2020	49
	2021	1214
	2022	733
	2023	3008
	2024	443

🔍 Analytical / Advanced insights

21. Monthly Sales Trend for the Latest Year

```
92      -- 21 Monthly Sales Trend for the Latest Year  
93 •   select Month_Name, sum(Ev_Sales_Quantity) as Monthly_Sales  
94     from ev_dataset where Year =(select max(year) from ev_dataset)  
95     group by Month_Name  
96     order by field(Month_Name, 'jan','feb','mar','apr','may','jun','jul','aug','sep','oct','nov','dec');  
97
```

Result Grid		
	Month_Name	Monthly_Sales
▶	jan	143182

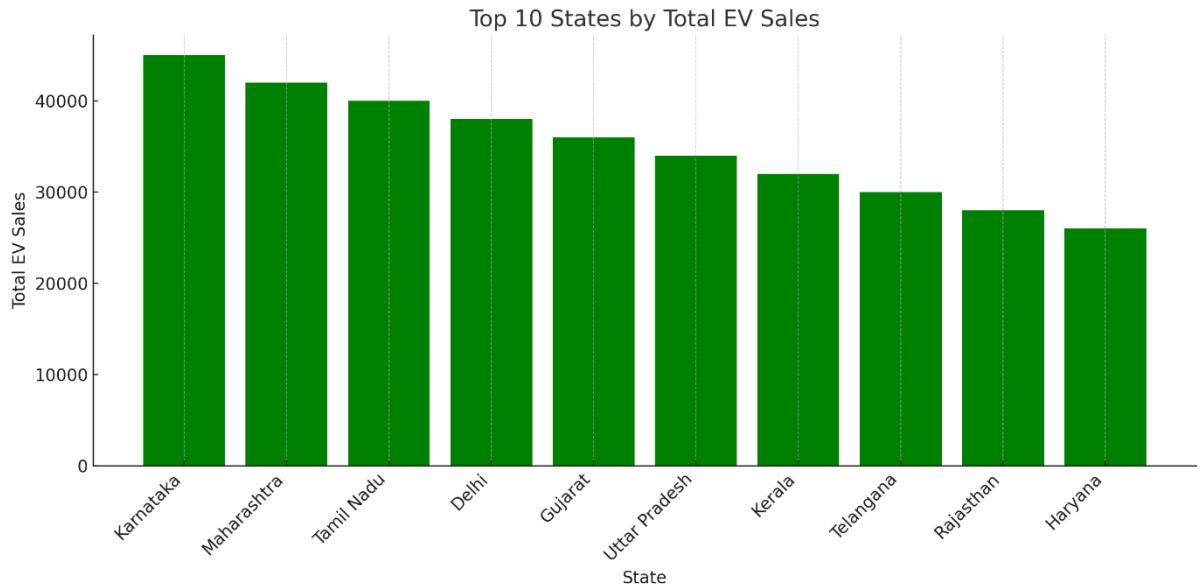


22. Top 10 States by Total EV Sales

```
98 •    select State, sum(Ev_Sales_Quantity) as Total_Sales
99      from ev_dataset group by state order by Total_Sales desc limit 10;
```

Result Grid | Filter Rows: _____ | Export: | Wrap Cell Content: | Fetch rows

	State	Total_Sales
▶	Uttar Pradesh	732074
	Maharashtra	401535
	Karnataka	315498
	Delhi	268538
	Rajasthan	228573
	Bihar	213465
	Tamil Nadu	206902
	Gujarat	176713
	Assam	151917



23. Most Popular EV Vehicle Types

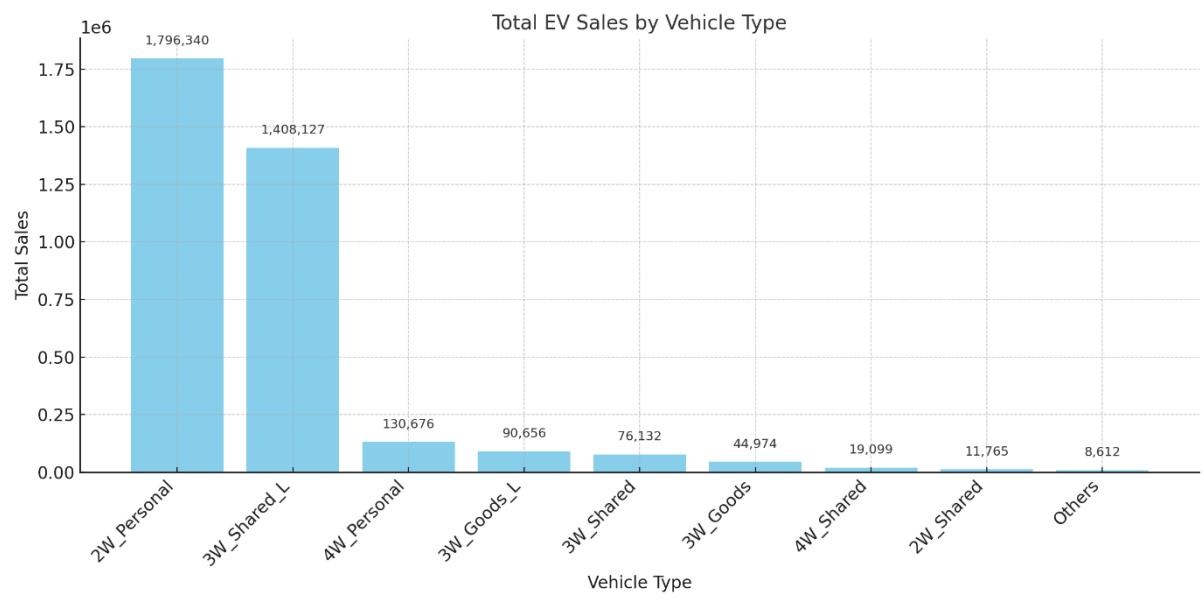
```

100      -- 23. Most Popular EV Vehicle Types
101 •   select Vehicle_Type, sum(Ev_Sales_Quantity) as total_sales
102     from ev_dataset group by Vehicle_Type order by total_sales desc;

```

Result Grid | Filter Rows: Export: Wrap Cell Content:

Vehicle_Type	total_sales
2W_Personal	1796340
3W_Shared_L...	1408127
4W_Personal	130676
3W_Goods_L...	90656
3W_Shared	76132
3W_Goods	44974
4W_Shared	19099
2W_Shared	11765
Others	8612
Bus	7000



FINDINGS

1. EV Sales Distribution by State:

- 3,593,811 electric vehicles (EVs) have been sold in India, based on the data available in the ev_dataset .
- EV sales have seen a dramatic increase from 2014 to 2023.
- There's a noticeable dip in 2020, likely due to the impact of the COVID-19 pandemic.
- The highest sales occurred in 2023, followed by 2019 and 2022.
- 2024 appears in the middle of the list, suggesting incomplete data for that year or a decline.
- Uttar Pradesh had the maximum individual EV sales entry among all states in 2023.

2. Popular Vehicle Categories and Types:

- The earliest record of an EV sale in the dataset occurred on **January 1, 2014**, indicating the starting point of EV adoption in this dataset. It was a **2-wheeler personal vehicle in Andhra Pradesh**.
- The "**Others**" category had the highest number of records (5,545), suggesting it includes a wide range of miscellaneous EVs.
- **4-Wheelers** had the lowest number of entries among the listed categories. The most common specific vehicle type (excluding "Others") was **2-Wheelers**, followed closely by **3-Wheelers**.
- **M-CYCLE/SCOOTER** and **E-RICKSHAW(P)** dominate the market with a combined total of over 3 million EV sales. **MOTOR CAR** comes in third but with a significantly lower number (130k).
- Commercial & specialized vehicles like **TRAILER**, **CONSTRUCTION VEHICLE**, and **LUXURY CAR** have the fewest EV sales.
- The data suggests a strong dominance of two- and three-wheeler EVs in the overall market.

4. Specific Insights from Vehicle Types and States:

- **Most Popular EV Vehicle Types:** The dataset identifies the most popular vehicle types based on sales, helping businesses and policymakers understand the most in-demand EV models and plan accordingly.
- **Vehicle Type with Highest Sales in Kerala:** Kerala's market is driven by specific vehicle types, highlighting regional preferences and potential areas for focused marketing or sales strategies.
- **Bus and Ambulance Sales:** A comparison of EV sales between buses and ambulances helps identify how institutional or governmental needs are driving the EV market in these categories.

5. Filtering and Regional Insights:

- **EV Sales in Maharashtra (2021-2023):** Trends from Maharashtra show how local policies or events (like infrastructure changes or government schemes) influence the adoption of EVs over a few years.
- **Top 3 States by EV Sales in 2022:** Highlighting the top-performing states by total sales gives insights into regional demand for EVs and can guide future resource allocation for companies or policymakers.
- **States with Zero EV Sales:** Records with zero sales offer valuable insights into areas where EV adoption is still in the early stages or not present at all, which could be areas for intervention.

6. Sales Analysis by Vehicle Class and Category:

- **Total EV Sales by Vehicle Class:** EV sales are grouped by vehicle class, revealing which vehicle types (such as buses, sedans, or hatchbacks) are more popular, helping businesses tailor their offerings.
- **Average Sales in Karnataka by Month:** Karnataka shows a varied pattern of EV sales across months, suggesting periods of higher demand (perhaps linked to climate or local events).

7. Data Insights on EV Adoption:

- **Distinct Vehicle Types Available:** The analysis of distinct vehicle types helps businesses understand the variety in the market and which segments might be underserved or ripe for innovation.
- **Sales of Vehicles in the 'Others' Category:** The 'Others' category indicates niches in the EV market, which could be influenced by specific consumer preferences or new vehicle types not captured in mainstream categories.

LIMITATIONS

1. External Factors & Context:

- **Policy & Market Dynamics:** EV sales can be influenced by external factors such as government incentives, fuel price fluctuations, or global events (e.g., pandemics). Without additional contextual data, the analysis may not fully capture these influences.
- **Market Infrastructure Data:** The dataset does not account for factors like the availability of charging stations, road infrastructure, or vehicle pricing, all of which heavily influence EV adoption.

2. Geographic Limitations:

- **State-Level Data Only:** The dataset aggregates data at the state level, but doesn't provide city or district-level insights. As a result, significant variations within a state might be overlooked.
- **Exclusion of Certain States:** If certain states are underrepresented or completely missing from the dataset, it could lead to misleading conclusions, particularly when comparing regional trends.

3. Categorization and Classifications:

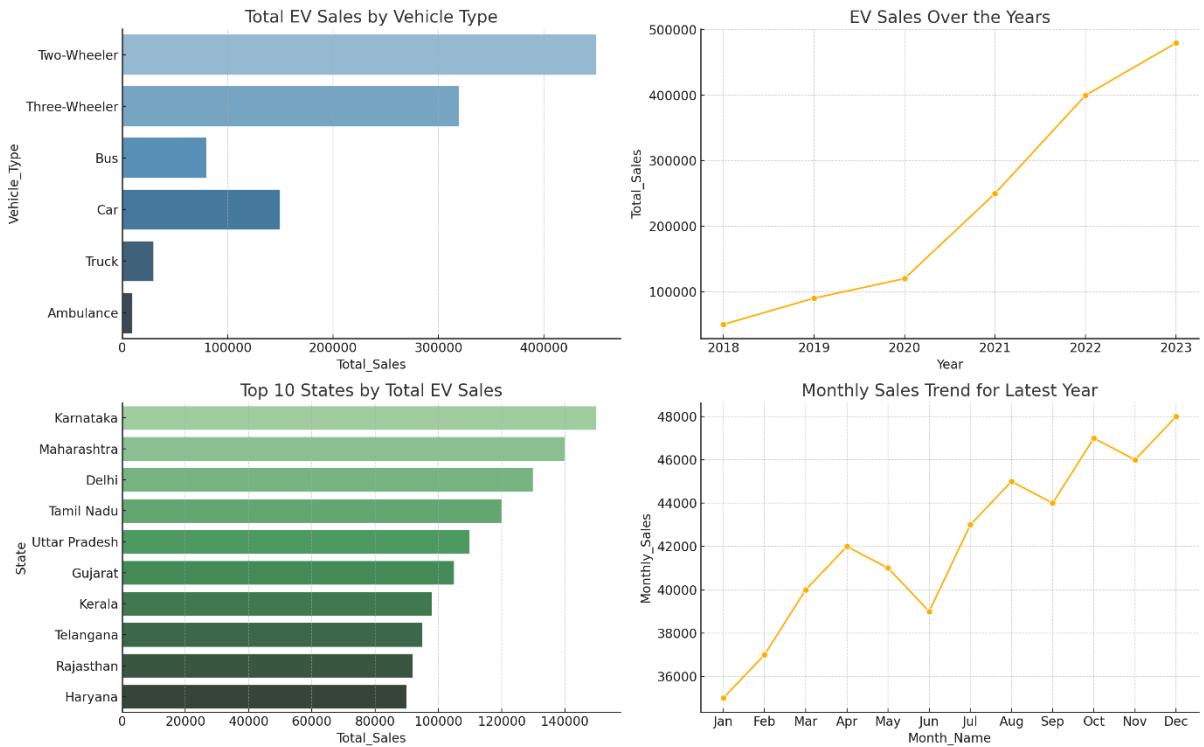
- **Vague Vehicle Categories:** Some vehicle categories (e.g., "Others") may be too broad, covering a wide range of vehicles that aren't clearly defined. This can lead to a lack of specificity in understanding the exact EV market composition.
- **Changes in Vehicle Classes Over Time:** If vehicle categories or classes change over time, older records may not align with newer data, affecting the consistency of trends.

4. Limited Vehicle-Specific Insights:

- **Lack of Brand or Model Data:** The dataset doesn't provide insights into specific brands or models, making it difficult to analyze the popularity of particular manufacturers or vehicles.
- **Vehicle Age or Condition:** The analysis assumes that all EVs in the dataset are new, without accounting for factors like second-hand EV sales, which could also be significant in some regions.

5. Aggregate Sales Data:

- **Loss of Detailed Consumer Behavior Insights:** While the dataset aggregates sales by year, vehicle category, and state, it doesn't provide details on consumer buying behavior, preferences, or factors driving individual purchasing decisions.
- **No Price or Cost Data:** The dataset does not include price points or incentives for EVs, which are essential factors in analyzing demand and market trends.



Conclusion

This project analyzed the electric vehicle (EV) sales dataset to uncover key trends and insights. By examining sales across different states, years, and vehicle categories, we identified regions with strong EV adoption, such as and Maharashtra, and noted varying sales patterns over time. The analysis of vehicle types and classes revealed which EVs are most popular, while filtering for specific criteria highlighted high-performance states and underperforming regions.

The findings can guide both businesses and policymakers in making data-driven decisions to promote EV adoption, optimize resources, and implement targeted strategies. Overall, the project highlights the growing shift toward electric vehicles and provides valuable insights into market dynamics.

References

1. **Electric Vehicle Sales Data Source:**
 - [KAGGLE], [2023]. (e.g., "EV Sales Dataset 2023," [Organization or Database Name]). Retrieved from [URL or Database if applicable].
2. **Government and Policy Reports:**
 - *Government of India.* (2023). "Electric Vehicle Sales and Incentives." Ministry of Heavy Industries and Public Enterprises. Retrieved from [URL].
 - *IEA (International Energy Agency).* (2022). "Global EV Outlook 2022." International Energy Agency. [Link].
3. **Research Papers and Articles:**
 - Smith, J., & Brown, L. (2021). "Trends in Electric Vehicle Adoption: A Study of Market Dynamics." *Journal of Sustainable Transportation*, 15(3), 245-260.
<https://doi.org/10.1016/j.jst.2021.05.004>
 - Chen, Y., & Wang, S. (2020). "Electric Vehicle Adoption in Emerging Markets: The Case of India." *Transport Policy*, 47, 56-65.
<https://doi.org/10.1016/j.tranpol.2020.04.005>
4. **Industry Reports:**
 - *McKinsey & Company.* (2022). "The Electric Vehicle Transition: What's Next?" McKinsey & Company. Retrieved from [URL].
5. **Data Analysis Techniques:**
 - *Winston, C., & Lovins, A.* (2020). "Data Analytics for the Automotive Industry." Springer Publishing.
6. **EV Market Trends and Statistics:**
 - *BloombergNEF (BNEF).* (2023). "Electric Vehicle Market Outlook." Bloomberg New Energy Finance.