EV DATA ANALYTICS: ATLIQ MOTORS INDIA

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TOOLS: Python, MS Power Point

DATA INFORMATION

DIM_DATE

date	fiscal_year	quarter
1-Apr-21	2022	Q1
1-May-21	2022	Q1
1-Jun-21	2022	Q1
1-Jul-21	2022	Q2
1-Aug-21	2022	Q2

EV_SALES_MAKER

date	vehicle_category	maker	electric_vehicles_sold
3/1/2024	2-Wheelers	BGAUSS	3070
3/1/2024	2-Wheelers	BATTRE ELECTRIC	625
3/1/2024	2-Wheelers	KINETIC GREEN	3915
3/1/2024	2-Wheelers	REVOLT	585
3/1/2024	2-Wheelers	OTHERS	10579

PCS_2024

State	No. of PCS
Andaman & Nicobar Island	3
Andhra Pradesh	327
Arunachal Pradesh	9
Assam	86
Bihar	124

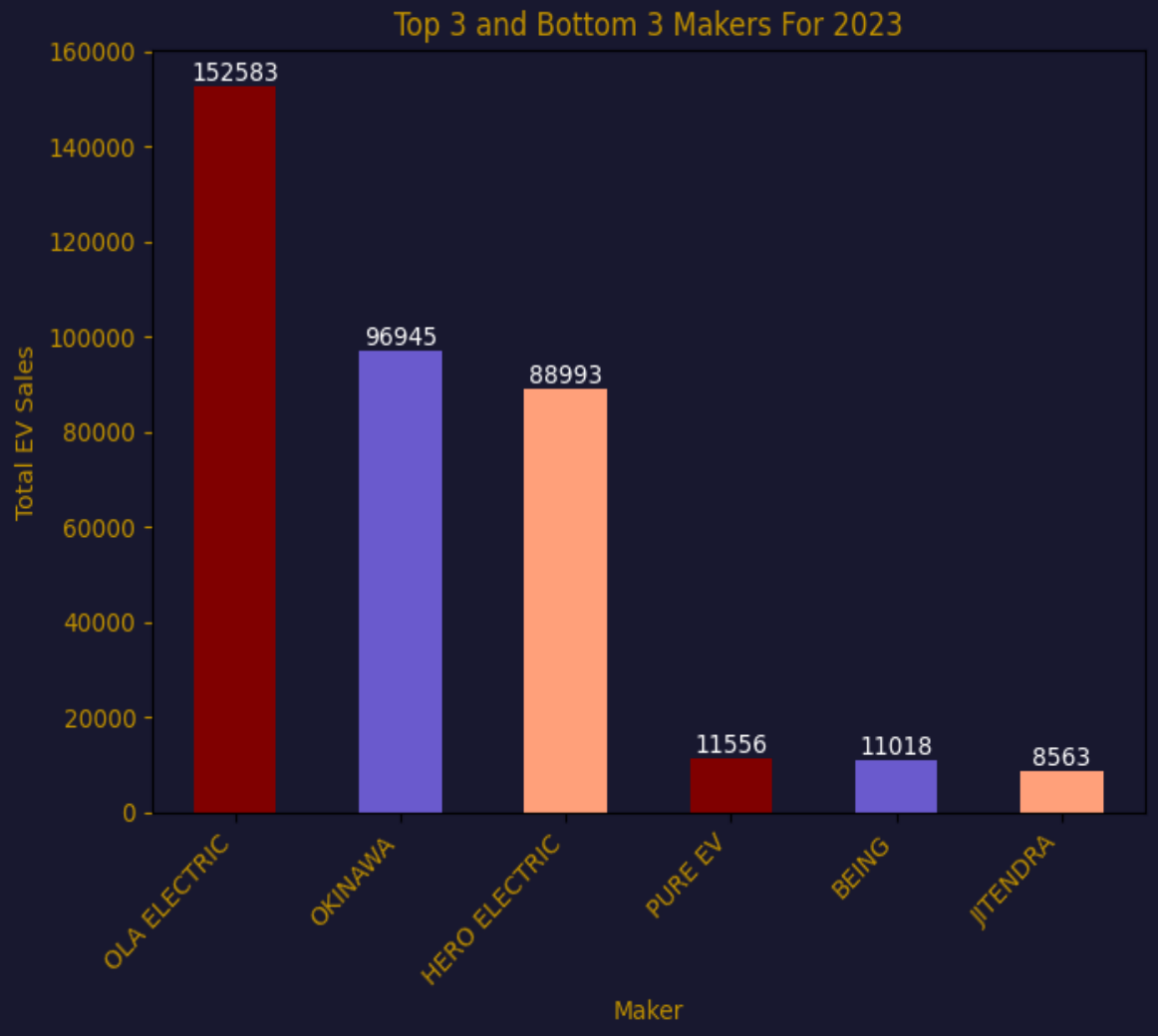
EV_SALES_STATE

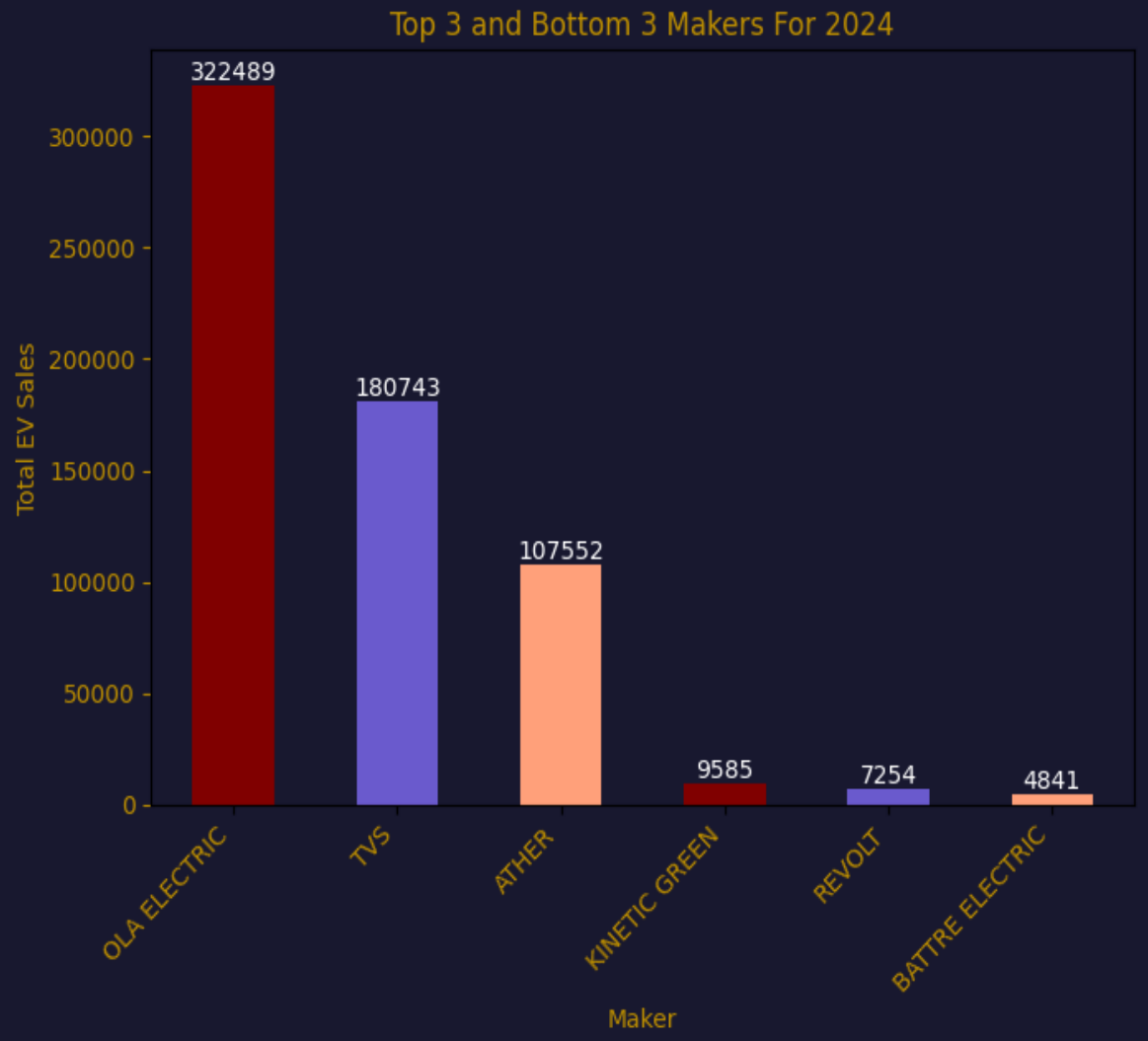
date	state	vehicle_category	electric_vehicles_sold	total_vehicles_sold
3/1/2024	Mizoram	2-Wheelers	58	1932
3/1/2024	DNH and DD	2-Wheelers	25	780
3/1/2024	Manipur	2-Wheelers	13	1394
3/1/2024	Andaman & Nicobar Island	2-Wheelers	2	447
3/1/2024	Nagaland	2-Wheelers	2	1180

Datasets :DIM_DATE, EV_SALES_STATE, EV_SALES_MAKER Source:“codebasics.io”.
Dataset: PCS_2024(Public charging station) Source: “www.data.gov.in”.
Other information Source: ‘vahan.parivahan.gov.in’,’ ’www. tatacapital.com’, ’www.godigit.com’

PRIMARY QUESTIONS

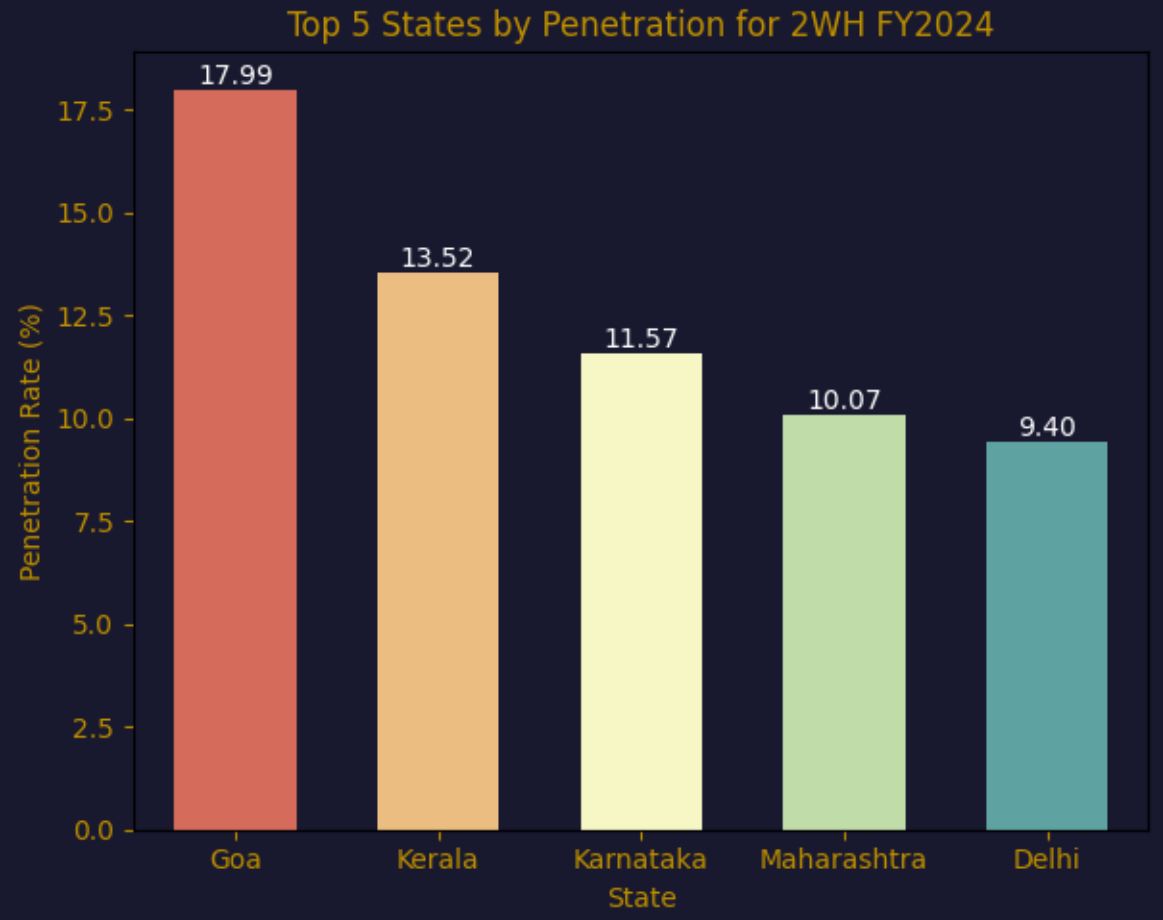
1.List the top 3 and bottom 3 makers for the fiscal years 2023 and 2024 in terms of the number of 2-wheelers sold.

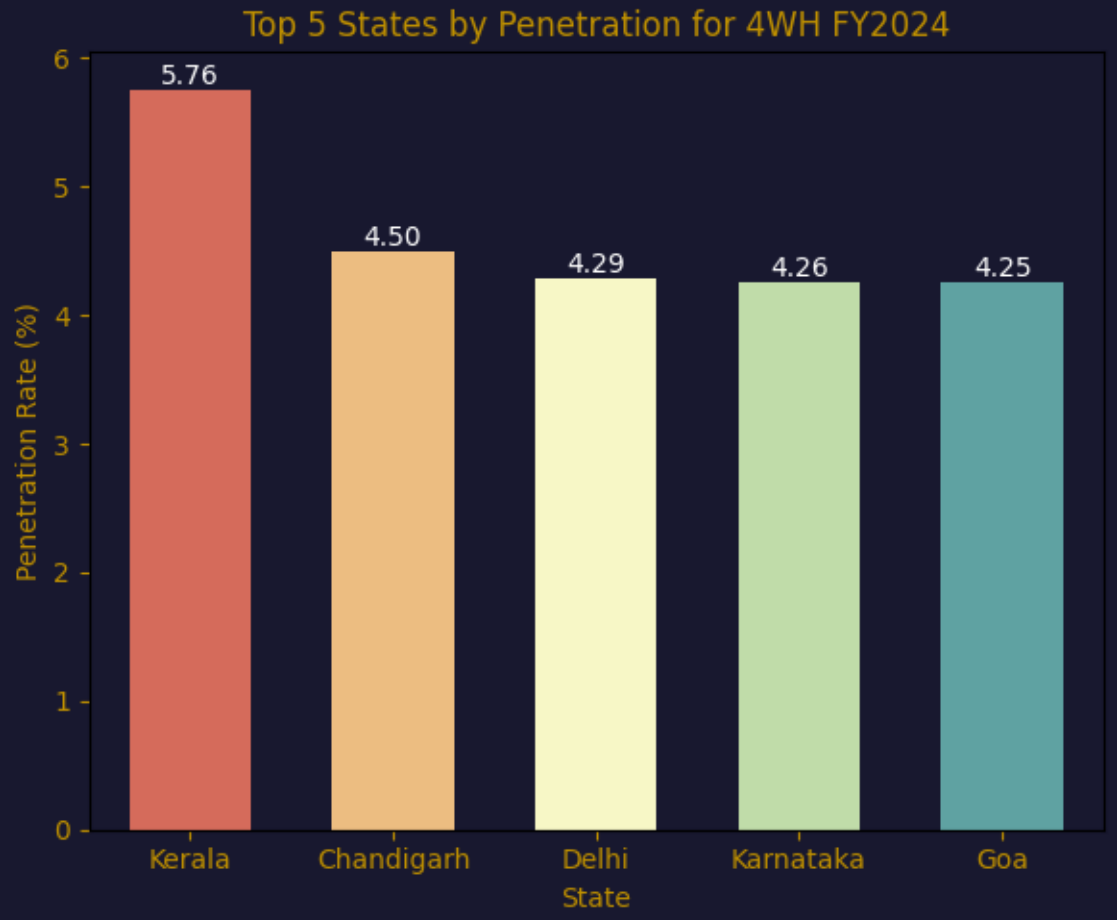




PRIMARY QUESTIONS

2.Identify the top 5 states with the highest penetration rate in 2-wheeler and 4-wheeler EV sales in FY 2024.





PRIMARY QUESTIONS

3.List the states with negative penetration (decline) in EV sales from 2022 to 2024?

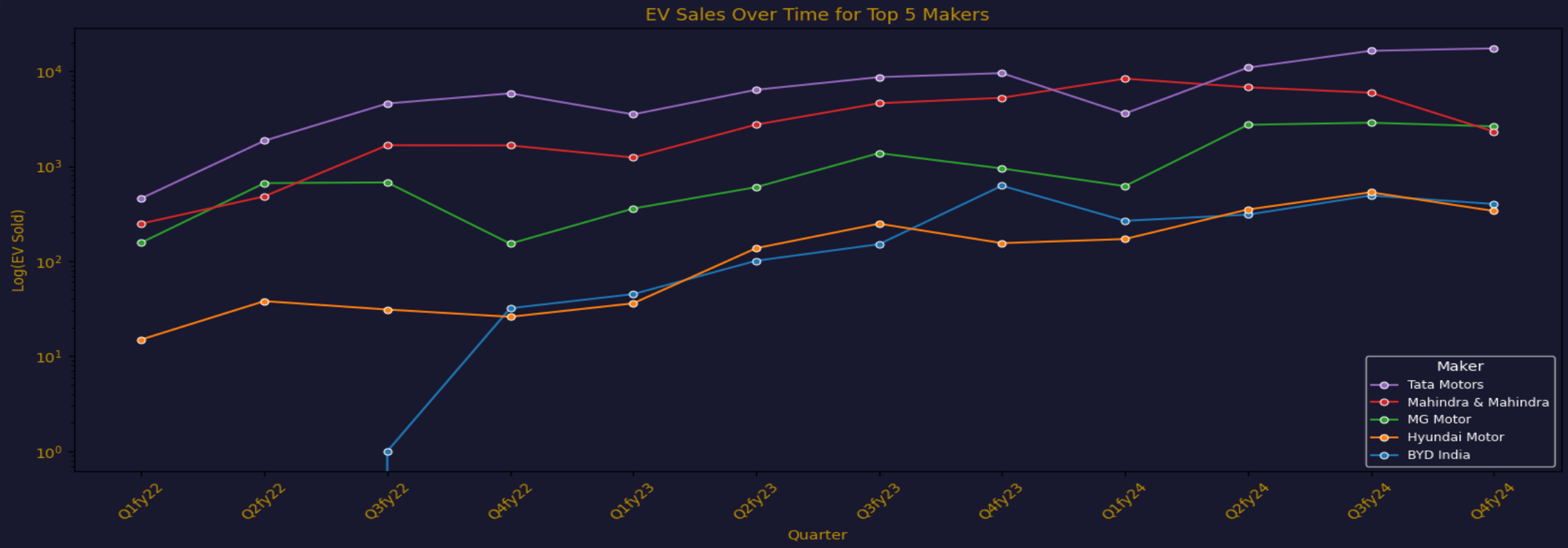
state	sales_growth	pen_growth	state	sales_growth	pen_growth
Andaman & Nicobar Island	13	0.06	Ladakh	19	0.55
Andhra Pradesh	19255	2.44	Madhya Pradesh	35307	2.54
Arunachal Pradesh	31	0.11	Maharashtra	148795	5.69
Assam	2767	0.45	Manipur	101	0.61
Bihar	10240	0.79	Meghalaya	129	0.35
Chandigarh	2466	5.26	Mizoram	275	1
Chhattisgarh	24006	4.51	Nagaland	8	0.05
DNH and DD	163	0.93	Odisha	29620	4.35
Delhi	30189	3.59	Puducherry	2364	3.66
Goa	9021	10.08	Punjab	6670	0.93
Gujarat	66333	3.66	Rajasthan	46357	2.83
Haryana	5867	0.49	Sikkim	0	0
Himachal Pradesh	605	0.44	Tamil Nadu	57451	2.75
Jammu and Kashmir	849	0.57	Tripura	276	0.58
Jharkhand	5117	0.92	Uttar Pradesh	47536	1.56
Karnataka	117878	5.9	Uttarakhand	4257	1.52
Kerala	60299	9.61			

It is evident from the data that there is no negative growth in EV sales or penetration

PRIMARY QUESTIONS

4.What are the quarterly trends based on sales volume for the top 5 EV makers (4-wheelers) from 2022 to 2024?

maker	Q1fy22	Q2fy22	Q3fy22	Q4fy22	Q1fy23	Q2fy23	Q3fy23	Q4fy23	Q1fy24	Q2fy24	Q3fy24	Q4fy24
BYD India	0	0	1	32	45	101	151	623	266	309	491	400
Hyundai Motor	15	38	31	26	36	137	248	155	171	350	531	338
MG Motor	157	663	674	153	358	601	1372	946	616	2725	2866	2622
Mahindra & Mahindra	249	481	1659	1653	1233	2738	4591	5243	8337	6761	5932	2316
Tata Motors	459	1852	4563	5834	3506	6364	8648	9528	3576	10882	16362	17361

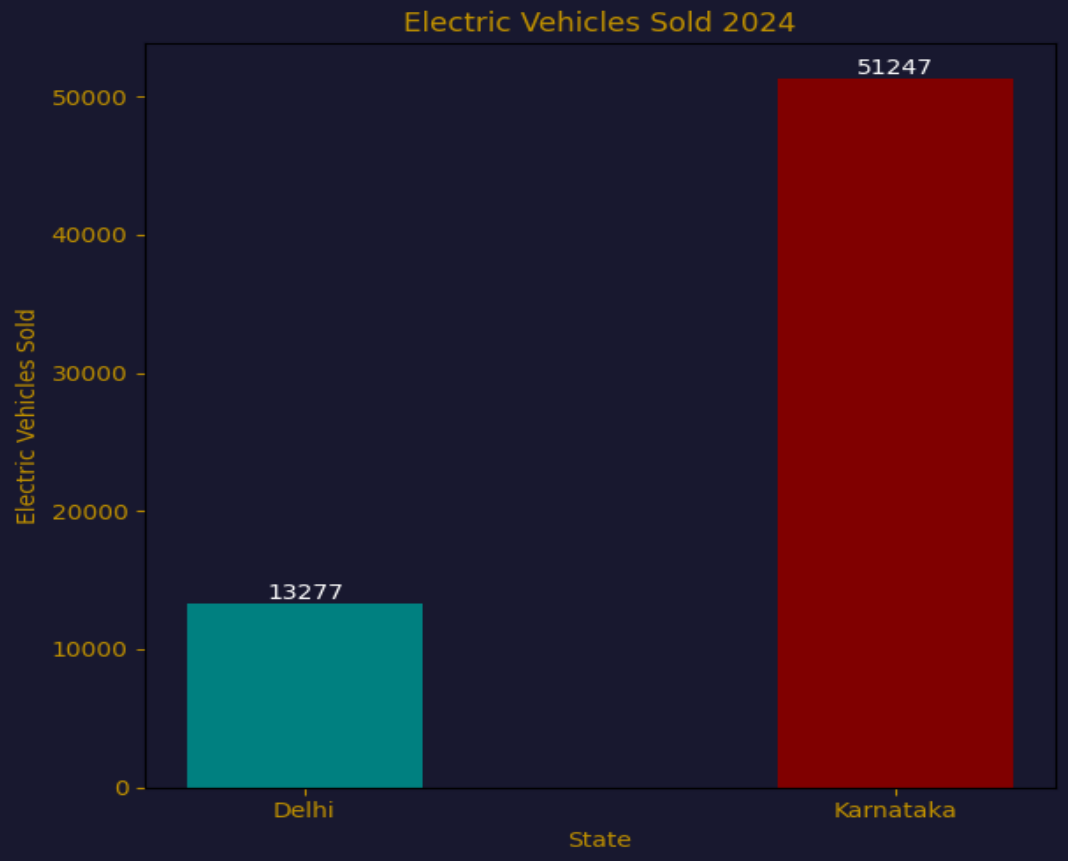


Tata motors have the highest EV sales followed by Mahindra & Mahindra(exception: Q1fy24) while BYD India and Hyundai motors lag in this race.
Regular increase in sales by all the makers are observed from (Q1FY22 to Q2Fy22) and (Q1FY23 to Q3FY23)

5.How do the EV sales and penetration rates in Delhi compare to Karnataka for 2024?

PRIMARY QUESTIONS

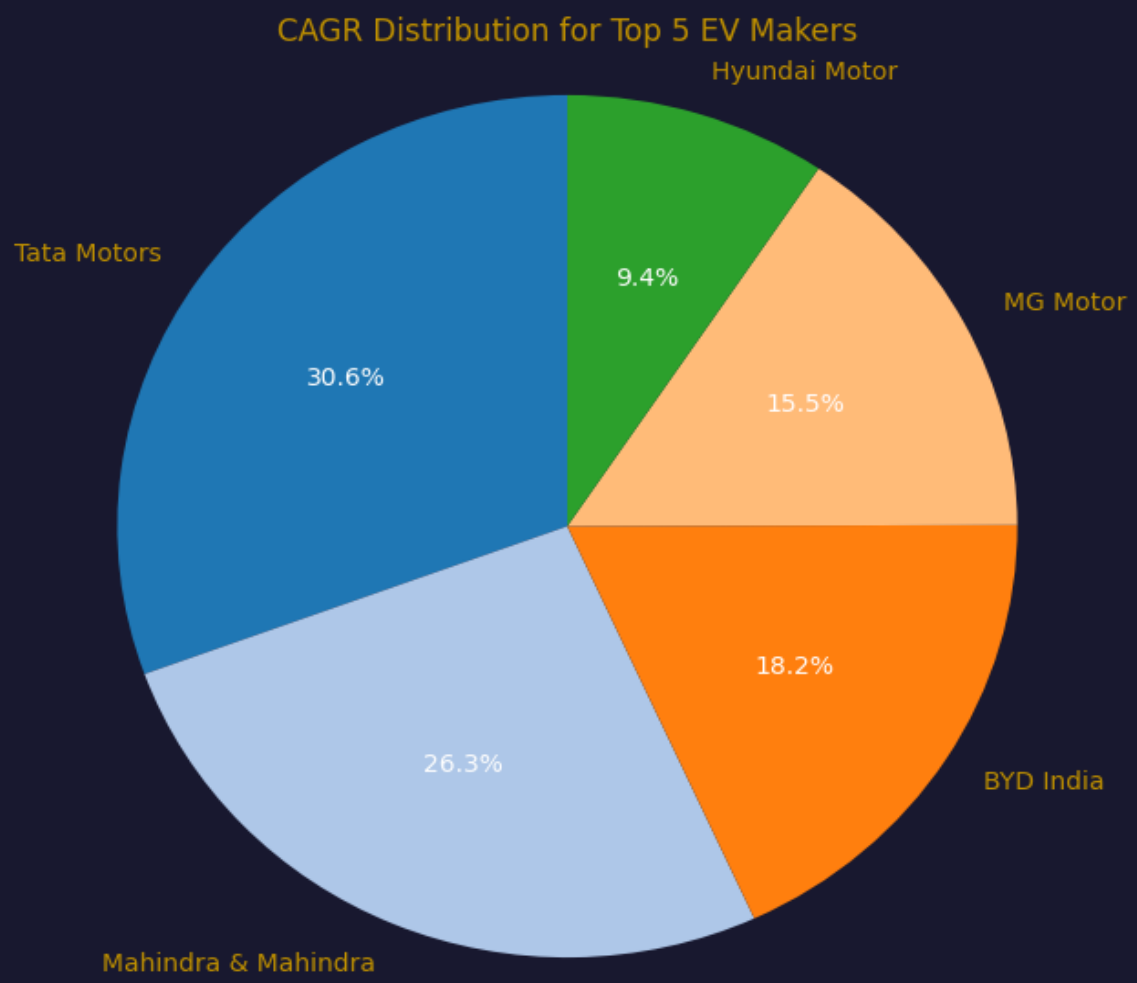
State	electric_vehicles_sold	total_vehicles_sold	penetration_rate
Delhi	13277	155839	8.52
Karnataka	51247	430905	11.89



Delhi has better sales but Karnataka boasts a better Penetration percentage

6.List down the compounded annual growth rate (CAGR) in 4-wheeler units for the top 5 makers from 2022 to 2024

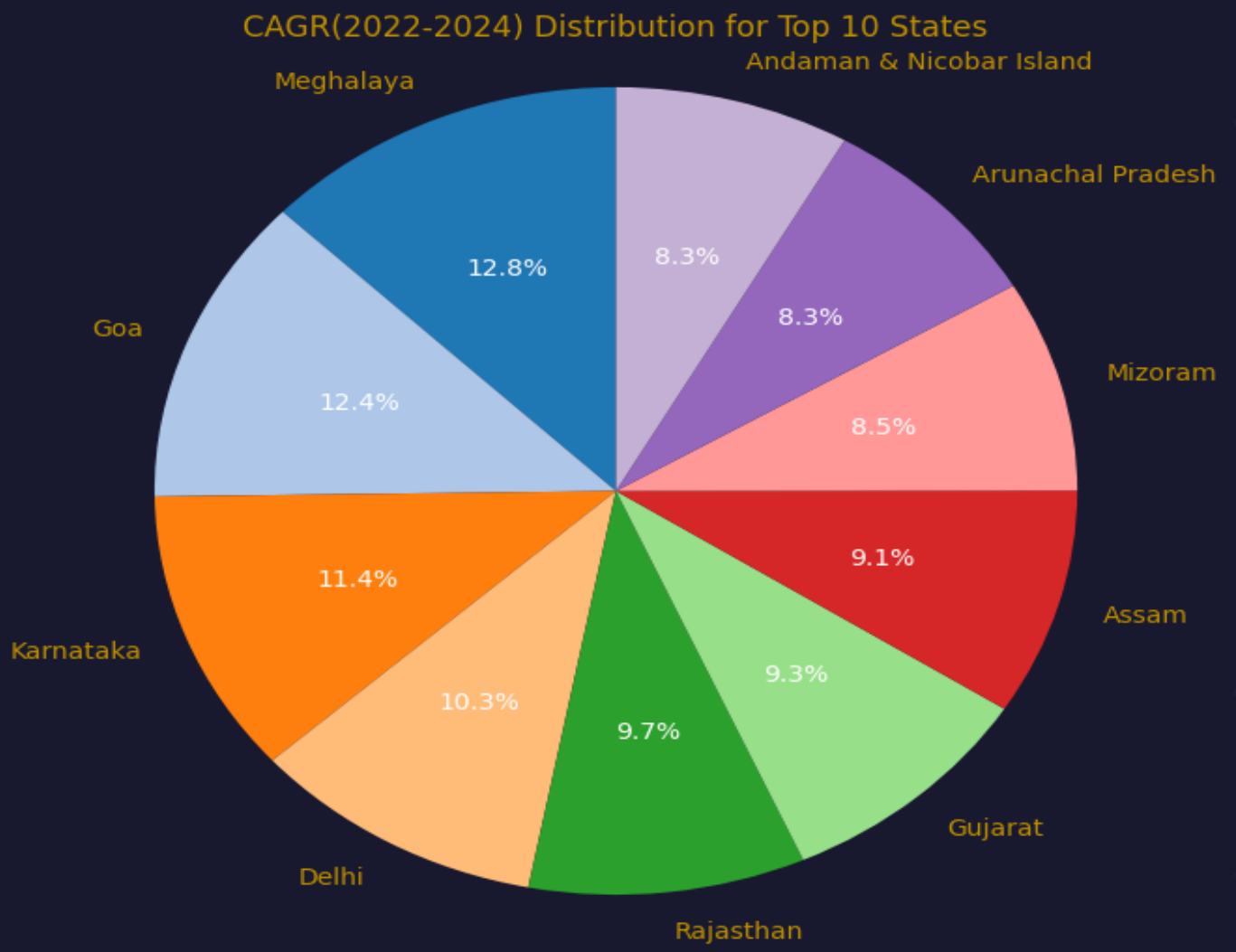
PRIMARY QUESTIONS



maker	CAGR_22_24
Tata Motors	426.40
Mahindra & Mahindra	366.21
BYD India	254.20
MG Motor	216.55
Hyundai Motor	131.53

PRIMARY QUESTIONS

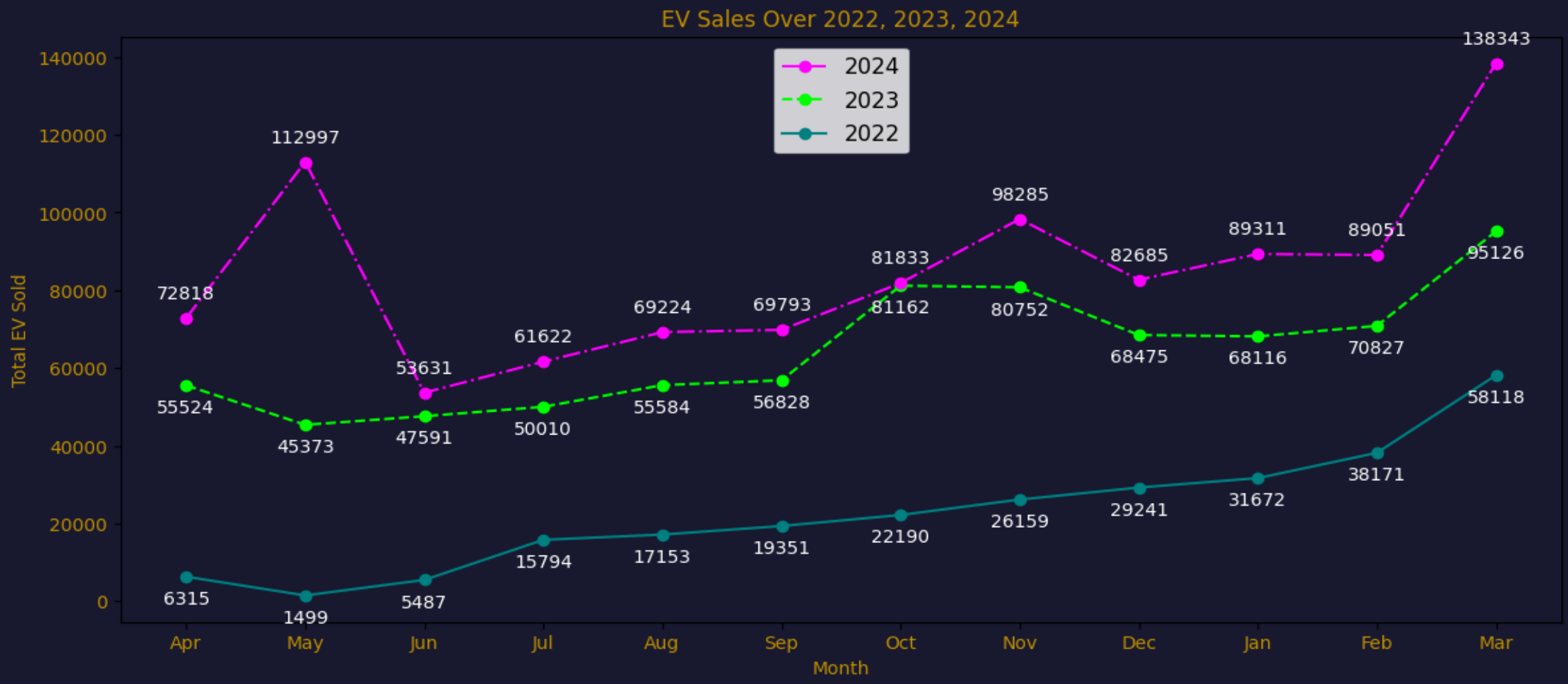
7.List down the top 10 states that had the highest compounded annual growth rate (CAGR) from 2022 to 2024 in total vehicles sold.



State	CAGR
Assam	1.792913
Himachal Pradesh	0.557549
Punjab	0.472096
West Bengal	0.399772
Rajasthan	0.386626
Mizoram	0.354579
DNH and DD	0.345309
Odisha	0.325224
Tripura	0.300985
Nagaland	0.262155

PRIMARY QUESTIONS

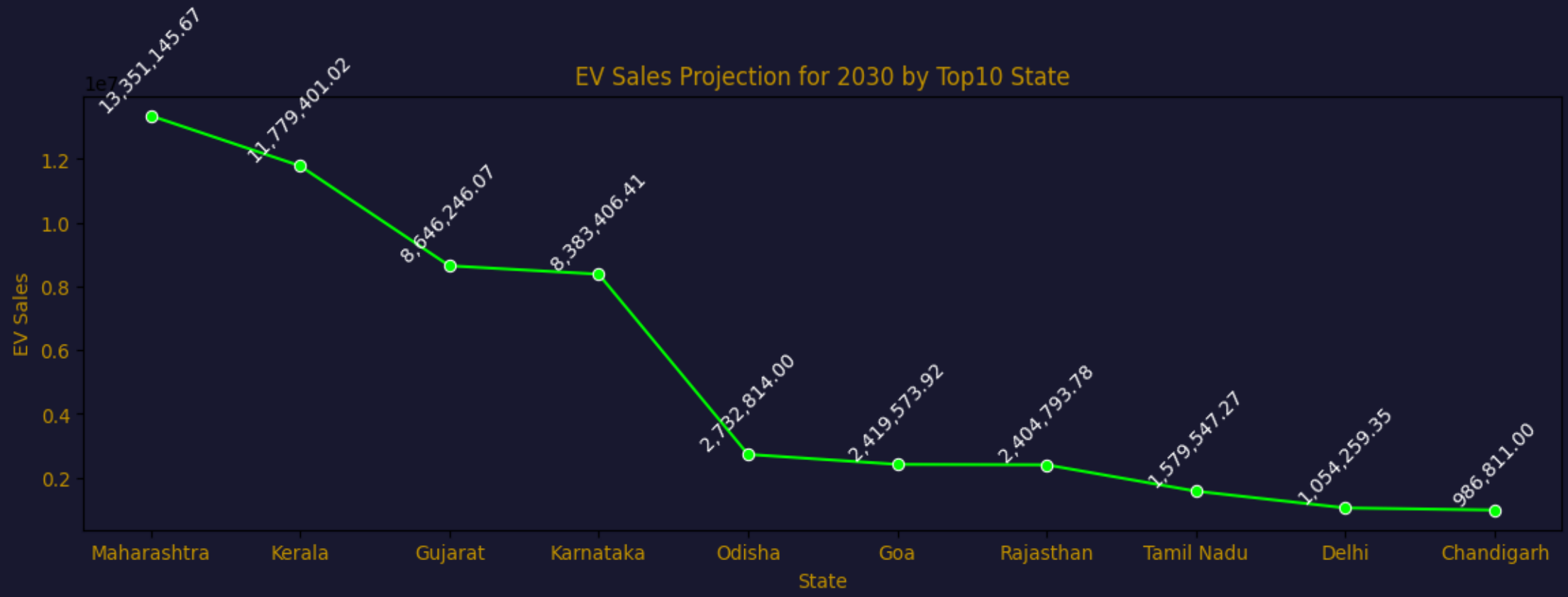
8. What are the peak and low season months for EV sales based on the data from 2022 to 2024?



Ev sales gradually increasing over years. Only Oct2023 and Oct2024 have nearly same EV sales.
{Highest EV sales:Mar2024(138343),lowest EV sales:May2022(1499)

PRIMARY QUESTIONS

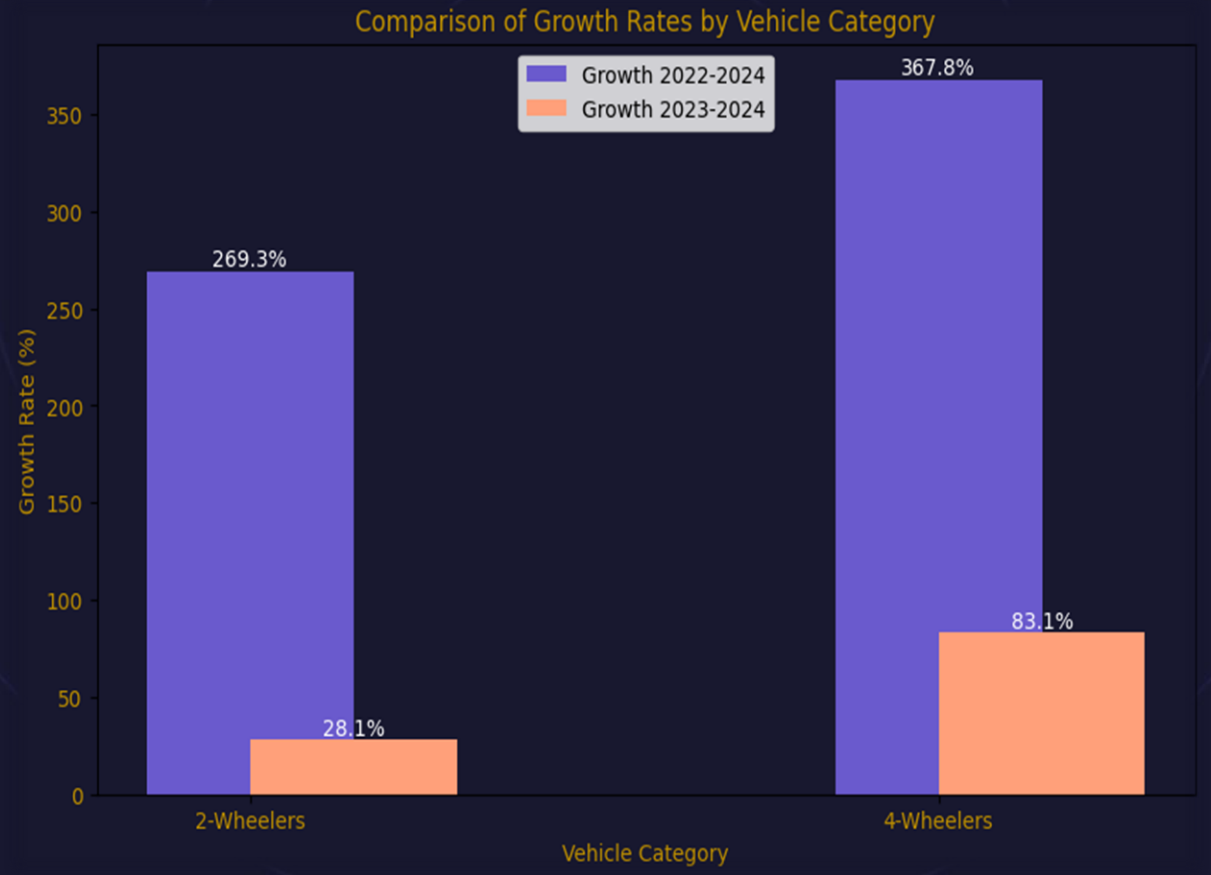
9. What is the projected number of EV sales (including 2-wheelers and 4-wheelers) for the top 10 states by penetration rate in 2030, based on the compounded annual growth rate (CAGR) from previous years?



PRIMARY QUESTIONS

10.Estimate the revenue growth rate of 4-wheeler and 2-wheelers EVs in India for 2022 vs 2024 and 2023 vs 2024, Avg unit price for 2_wheelers=85000, 4_wheelers=1500000

Vehicle category	Rev_2022	Rev_2023	Rev_2024	growth_22_24	growth_23_24
2-Wheelers	21468705000	61871755000	79278820000	269.28	28.13
4-Wheelers	27865500000	71197500000	130351500000	367.79	83.08



SECONDARY QUESTIONS

1.What are the primary reasons for customers choosing 4-wheeler EVs in 2023 and 2024 (cost savings, environmental concerns, government incentives)?

vehicle_category	Sales_2023	Sales_2024
2-Wheelers	575526	721124
4-Wheelers	33889	71075

Clearly customer are choosing more 2_wheeler EVs in 2023 and 2024 as compared to 4_wheeler EVs.

Please visit https://e-amrit.niti.gov.in/

Factors Affecting EV Purchase

Lower running cost

Lower maintenance cost

Zero tailpipe emissions

No noise pollution

Ease of charging at home

Tax and Financial benefits: FAME II benefits plus additional state wise incentives

Purchase Incentives: Direct discount provided to the user on the cost of the electric

vehicle Coupons: Financial incentive where the amount is reimbursed later

Interest Subventions: Discount offered on the interest rate while availing loan

Road tax exemption: Road tax at the time of purchase is waived off

Registration fee exemption: One-time registration fee applicable on new vehicle purchase is waived off

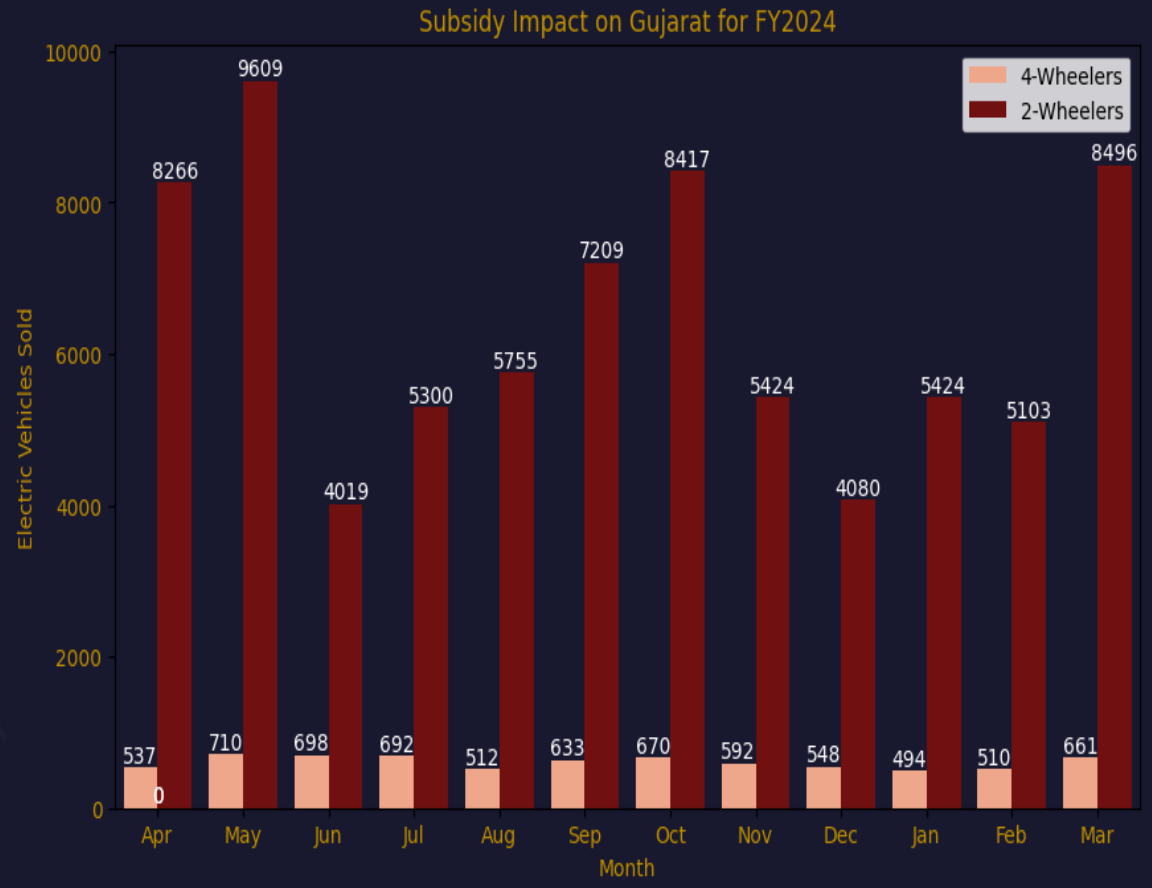
Income tax benefit: Provided as a deduction on the tax amount payable by an individual to the government

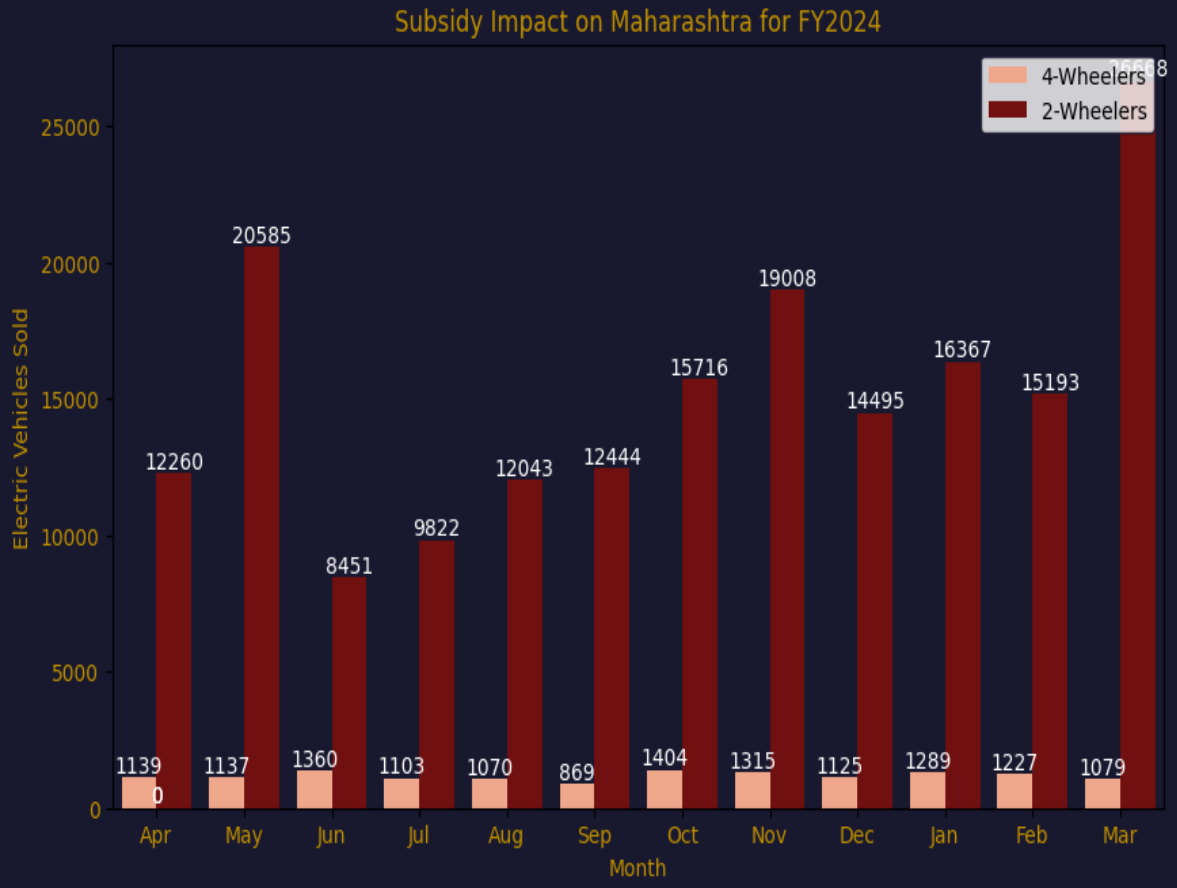
Scrapping incentives: Provided upon de-registering old Petrol and Diesel Vehicles

Others: Incentives such as interest-free loans, top-up subsidies, special incentives on electric three-wheelers, etc. can also be availed

2.How do government incentives and subsidies impact the adoption rates of 2-wheelers and 4-wheelers? Which states in India provided most subsidies?

SECONDARY QUESTIONS





We are looking into two best states w.r.t Govt. Subsidy & incentives. From Jun2023 to oct 2023 sales have constantly increased for two wheelers in Gujarat. From Jun2023 to Nov 2023 2_wheelers sales were growing in Maharashtra.4_wheelers sale is stagnant for Maharashtra also. FAME II subsidy is extended till 31st July 2024. So, we can expect more sales in upcoming months.

SECONDARY QUESTIONS

3.How does the availability of charging stations infrastructure correlate with the EV sales and penetration rates in the top 5 states?.....

TOP5 STATE AS PER EV SOLD

state	No. of PCS	electric_vehicles_sold	penetration_rate
Maharashtra	3083	396045	6.49
Karnataka	5130	312995	7.84
Tamil Nadu	643	200062	4.30
Gujarat	476	181389	4.40
Rajasthan	500	150366	4.55

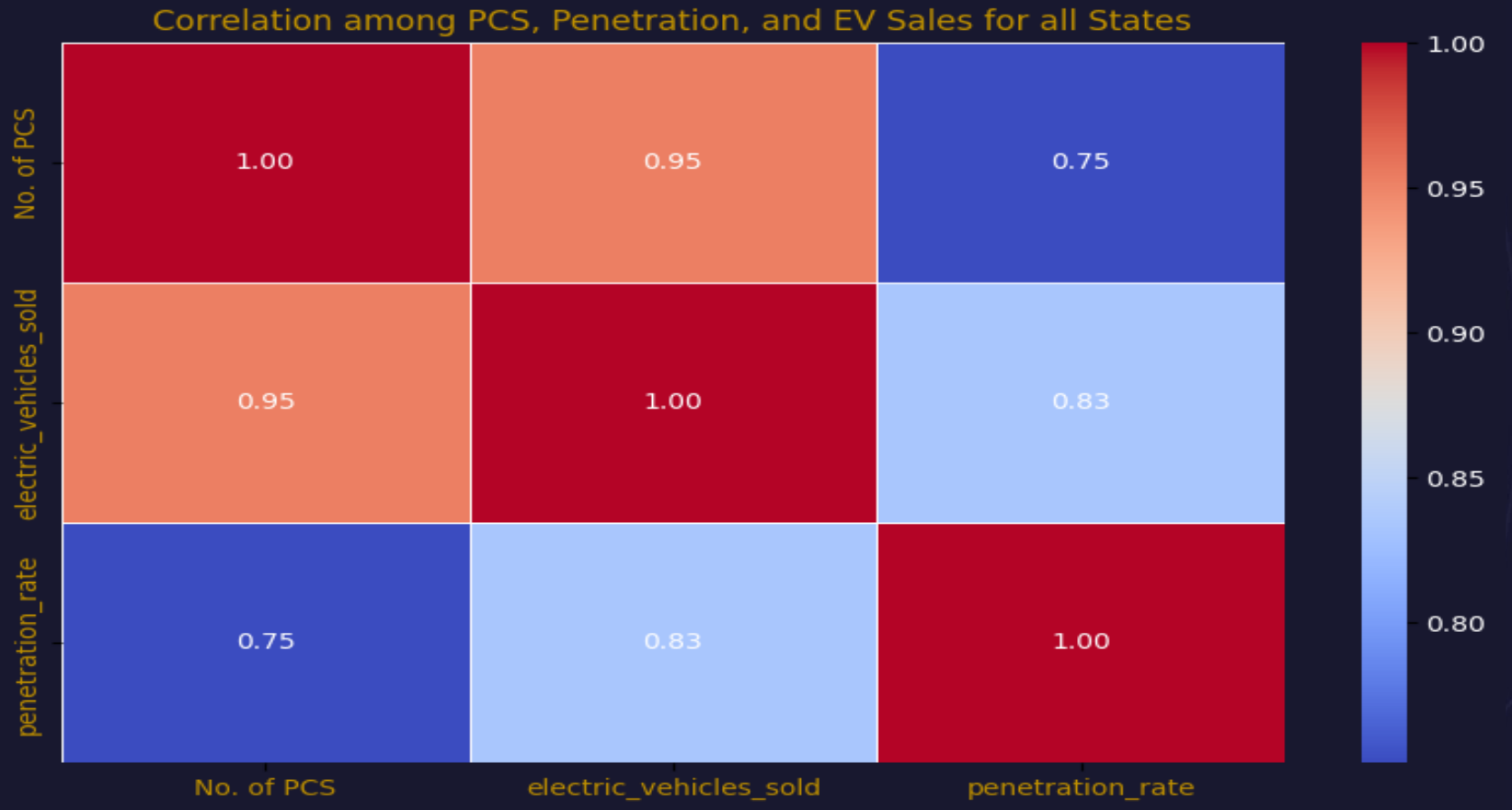
TOP5 STATE AS PER PENETRATION RATE

State	No. of PCS	electric_vehicles_sold	penetration_rate
Goa	113	19684	9.84
Karnataka	5130	312995	7.84
Delhi	1886	107312	6.76
Kerala	958	137060	6.64
Maharashtra	3083	396045	6.49

Maharashtra have better EV sales than Karnataka even if Karnataka have a lot more PCS than Maharashtra. Similarly, Goa got better penetration rate than Karnataka even if the later have very high PCS as compared to GOA. These data neither gives positive correlation or negative correlation. So, we need to consider all states data (for FY2024) to get better statistical output.

……3.How does the availability of charging stations infrastructure correlate with the EV sales and penetration rates in the top 5 states?

SECONDARY QUESTIONS



Correlation(No. of PCS and electric_vehicles_sold)=0.95
Correlation(No. of PCS and penetration_rate)=0.75
Correlation(electric_vehicles_sold and penetration_rate)= 0.83

All the correlations are positive, indicating that increases in one variable are associated with increases in the others. Significance of Charging Infrastructure: The strong correlations highlight the importance of charging infrastructure (No. of PCS) in influencing both sales of electric vehicles and their penetration rates in the market.

SECONDARY QUESTIONS

4.Who should be the brand ambassador if Atliq Motors launches their EV/Hybrid vehicles in India and why?

Ans: Atliq Motor has the option to hire one of two youth icons, both renowned for their impressive bike collections: MS Dhoni and John Abraham. However, if the goal is to minimize costs while still associating with a prominent figure, they can consider hiring Neeraj Chopra, a celebrated personality admired by Indians across the nation.

5.Which state of India is ideal to start the manufacturing unit? (Based on subsidies provided, ease of doing business, stability in governance etc.

Ans: Maharashtra, Karnataka, Tamil Nadu, Gujarat have better EV penetration and sales than other states (based on datasets)

Information collected from Internet:

Based on subsidies: Gujarat, Maharastra

Based on Ease of doing business: Gujarat, Tamilnadu

Based on political stability: Gujarat

Based on Lithium reserve: Jharkhand, Rajasthan, Tamilnadu

Based on OEM presence: Maharastra, Haryana, Gujarat

Connecting port: Gujarat(Mundra), Maharastra(JNPT)

Skilled Manpower: Maharastra, Tamil Nadu, Haryana, Gujarat

EV customer base: Maharastra

Infrastructure and market for growth: Gujarat

EV sales Projection: Maharashtra

Recommendation1: Gujarat **Recommendation2:** Maharashtra

SECONDARY QUESTIONS

6.Your top 3 recommendations for Atliq Motors.

1>Create manufacturing unit in Gujarat nearby Mundra port as soon as possible.
2> Prioritize 2-wheeler EVs manufacturing, as they offer higher sales potential and better market penetration at a lower cost. This strategic focus will enhance brand presence while minimizing expenses
3>Transport Electric vehicles to Navi Mumbai JNPT port from Mundra port and use Maharashtra's connectivity and largest customer base. Also use Customer demand of Rajasthan, Karnataka, Tamil Nadu. Try to maximize the impact of Gujarat's infrastructure and market.

Other Recommendations:

1> Create a research unit in Gujarat for alternative fuels like hydrogen or Aluminum.
2> Initially, Atliq Motors can introduce and attract Indian customers by launching its premium EV products, which are best sellers in North America. However, it is crucial to consider the purchasing power of Indian consumers and the pricing strategies of competitors to ensure market fit.
3> Procure Lithium from Nagaur district of Rajasthan

SUMMARY

- **No Negative Penetration Rates:** No state shows negative penetration in electric vehicle (EV) sales.
- **Tata Motors' Leadership:** Tata Motors consistently ranks as the top manufacturer in 4-wheeler EV sales.
- **Pollution vs. EV Sales in Delhi:** Despite being the most polluted city, Delhi has a low rate of EV sales and penetration.
- **Assam's Growth:** Assam leads in Compound Annual Growth Rate (CAGR) for total vehicle sales from 2022 to 2024 but lags in EV sales.
- **Sales Surge in March:** The month of March (the last month of the Indian fiscal year) experiences the highest EV sales, as consumers rush to save on income tax.
- **Positive Projections:** Strong EV sales projections for Maharashtra, Kerala, Gujarat, and Karnataka till FY2030.
- **Revenue vs. Sales:** While 2-wheelers are sold in larger numbers, 4-wheelers generate higher revenue.
- **Key Factors Influencing Sales:** Tax savings, State government incentives and subsidies, Availability of public charging stations (PCS)
- **Ideal States for Manufacturing Units:** Gujarat and Maharashtra are the best states to introduce EV manufacturing units.