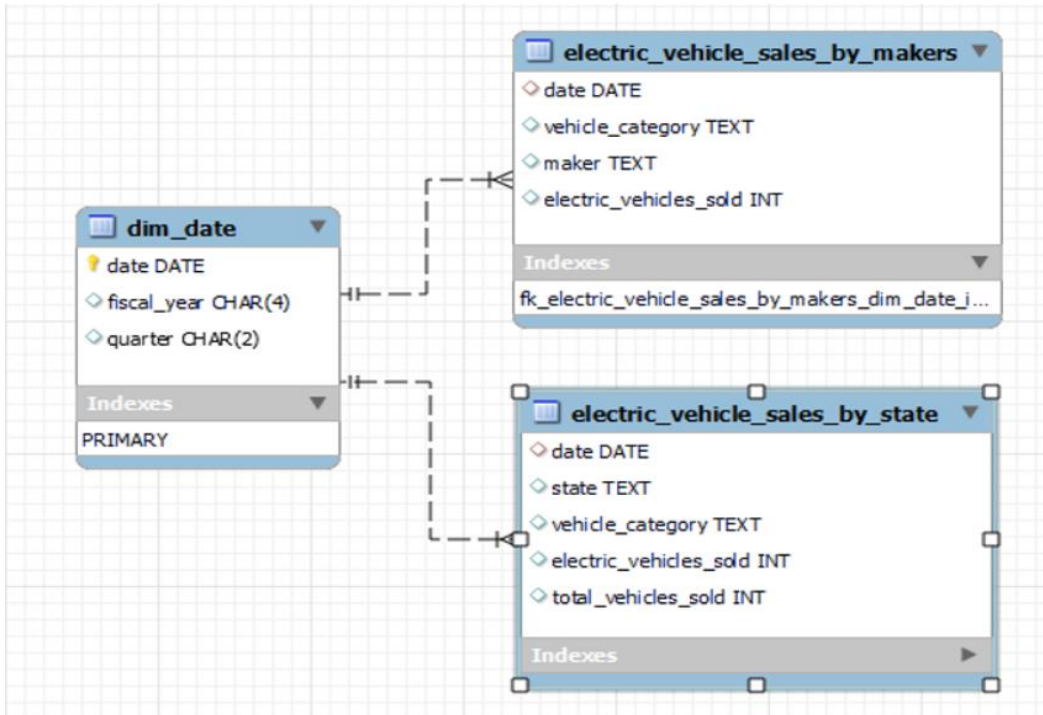


PRIMARY AND SECONDARY ANALYSIS

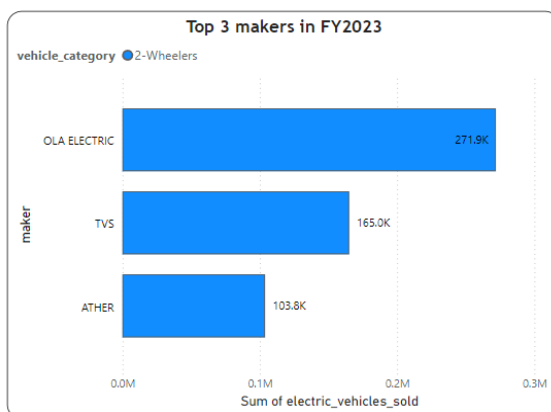
We are provided with 3 different data tables namely dim_date, electric_vehicle_sales_by_makers, electric_vehicle_sales_by_state and also shown in entity relationship diagram (ERD) below:



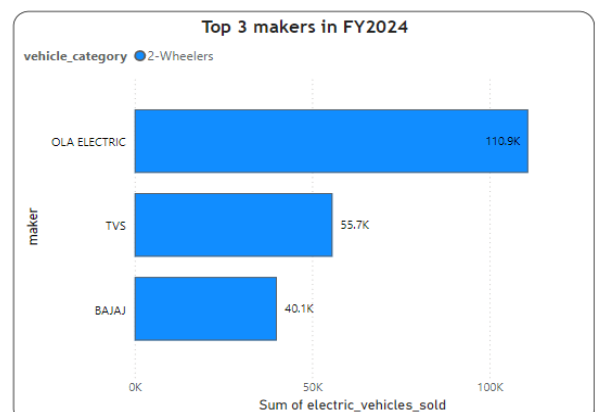
Preliminary Research Questions:

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.

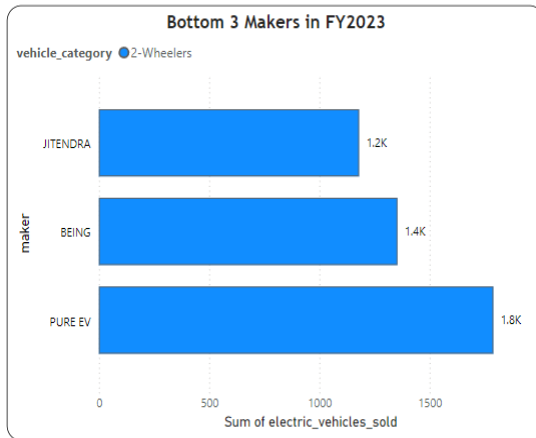
TOP 3 MAKERS IN FY 2023



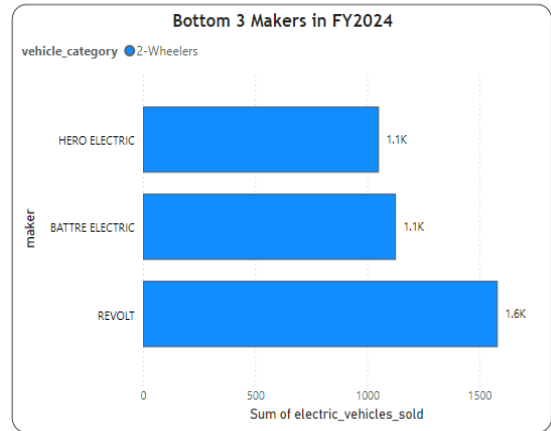
TOP 3 MAKERS IN FY 2024



BOTTOM 3 MAKERS IN FY 2023

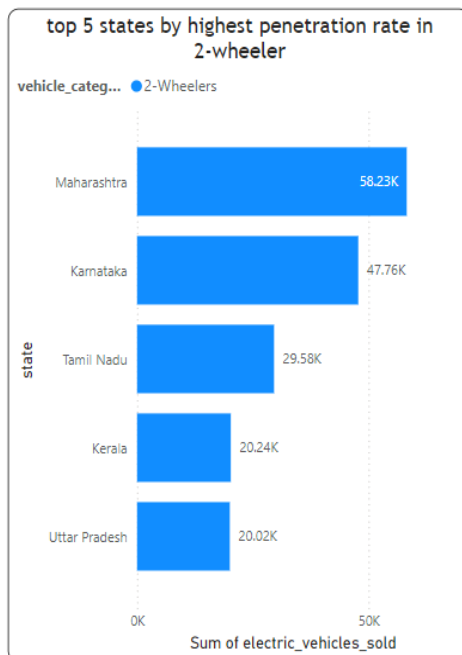


BOTTOM 3 MAKERS IN FY 2024

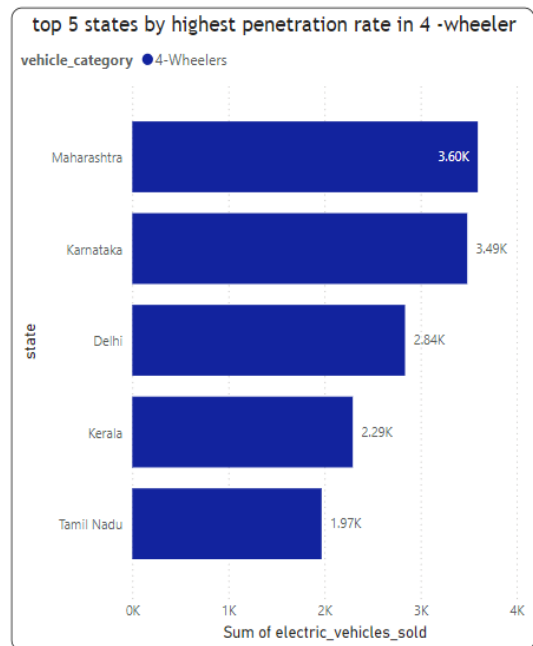


2. Identify the top 5 states with the highest penetration rate in 2-wheeler and 4-wheeler EV sales in FY 2024.

TOP 5 STATES BY IN 2-WHEELER



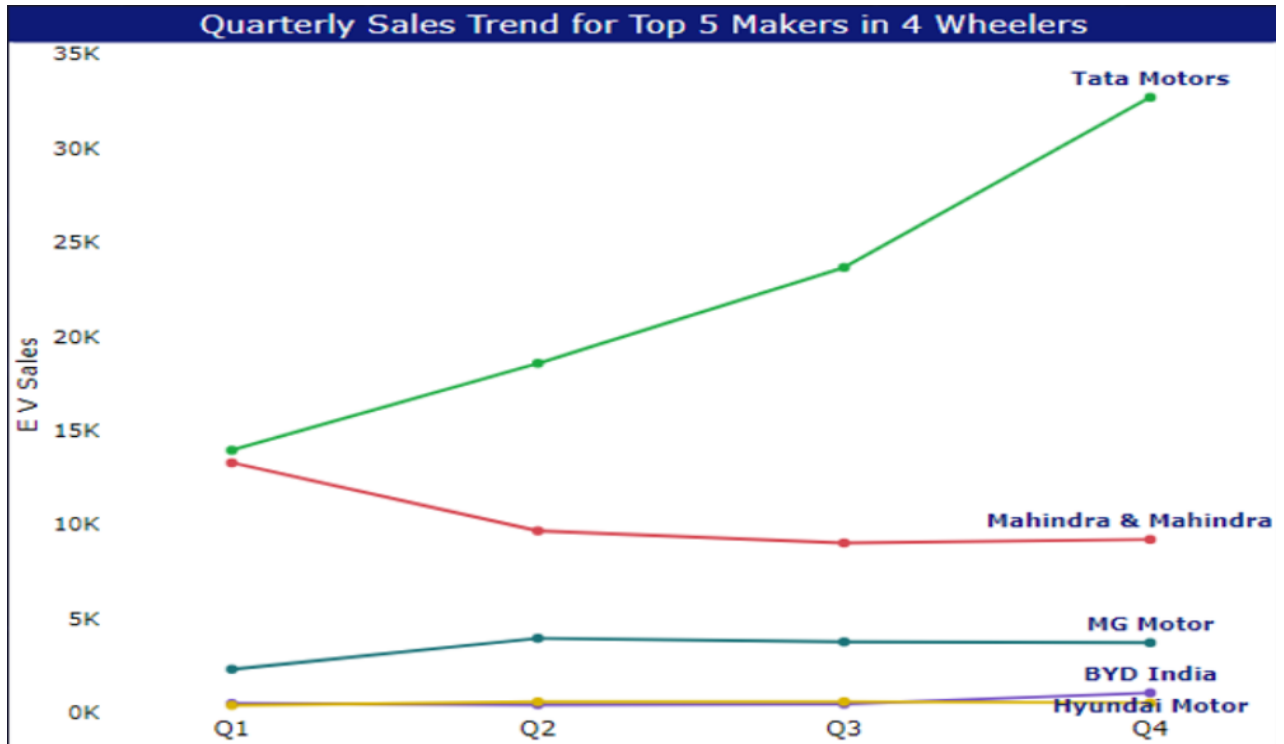
TOP 5 STATES BY IN 4-WHEELER



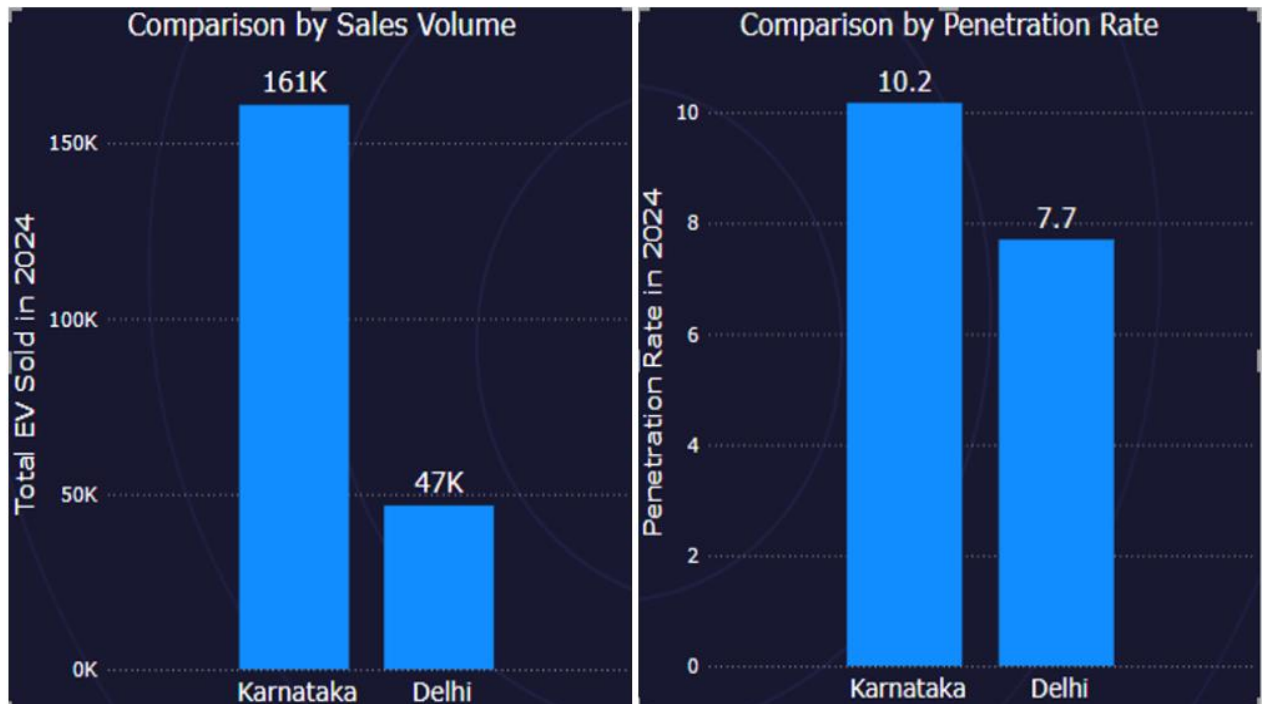
3. List the states with negative penetration (decline) in EV sales from 2022 to 2024?

Statewise Total EV Sales Comparison from FY 2022 to FY 2024						
State	FY 2022	FY 2024	Change	State	FY - 2022	FY - 2024
Andaman & Nicobar Island	22	35	13 ▲	Ladakh	12	31
Andhra Pradesh	13928	33183	19255 ▲	Madhya Pradesh	7916	43223
Arunachal Pradesh	0	31	31 ▲	Maharashtra	48374	197169
Assam	730	3497	2767 ▲	Manipur	25	126
Bihar	4829	15069	10240 ▲	Meghalaya	4	133
Chandigarh	411	2877	2466 ▲	Mizoram	0	275
Chhattisgarh	4534	28540	24006 ▲	Nagaland	1	9
Delhi	16535	46724	30189 ▲	Odisha	9498	39118
DNH and DD	35	198	163 ▲	Puducherry	734	3098
Goa	1778	10799	9021 ▲	Punjab	4528	11198
Gujarat	18026	84359	66333 ▲	Rajasthan	20087	66444
Haryana	5926	11793	5867 ▲	Sikkim	0	0
Himachal Pradesh	443	1048	605 ▲	Tamil Nadu	36863	94314
Jammu and Kashmir	1434	2283	849 ▲	Tripura	28	304
Jharkhand	2713	7830	5117 ▲	Uttar Pradesh	10222	57758
Karnataka	43111	160989	117878 ▲	Uttarakhand	2079	6336
Kerala	13639	73938	60299 ▲	West Bengal	2685	16864

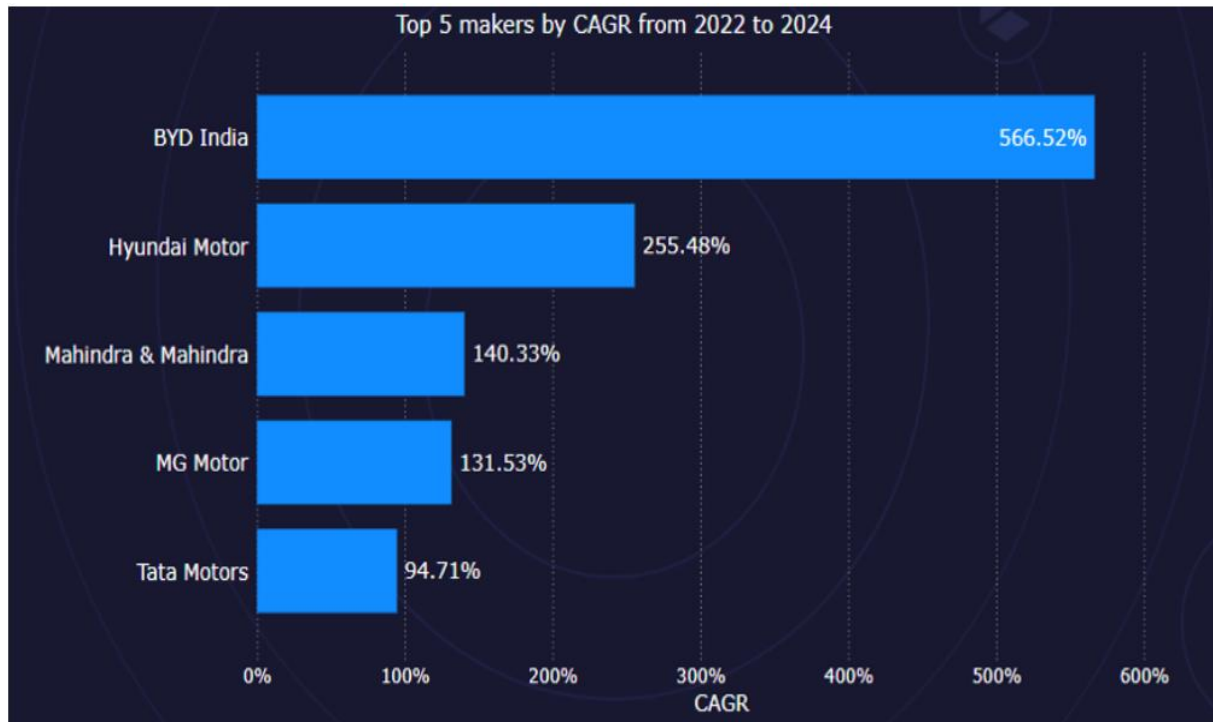
4. What are the quarterly trends based on sales volume for the top 5 EV makers (4-wheelers) from 2022 to 2024?



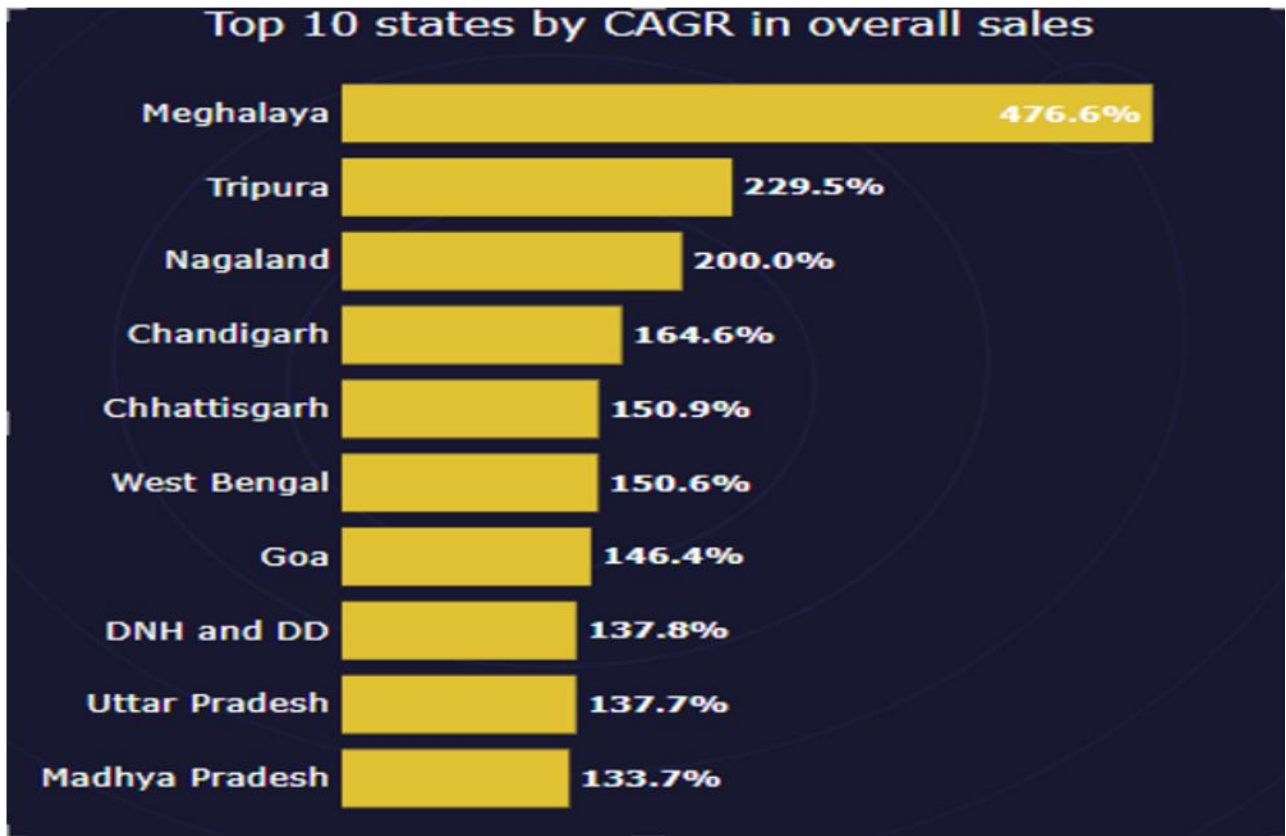
5. How do the EV sales and penetration rates in Delhi compare to Karnataka for 2024?



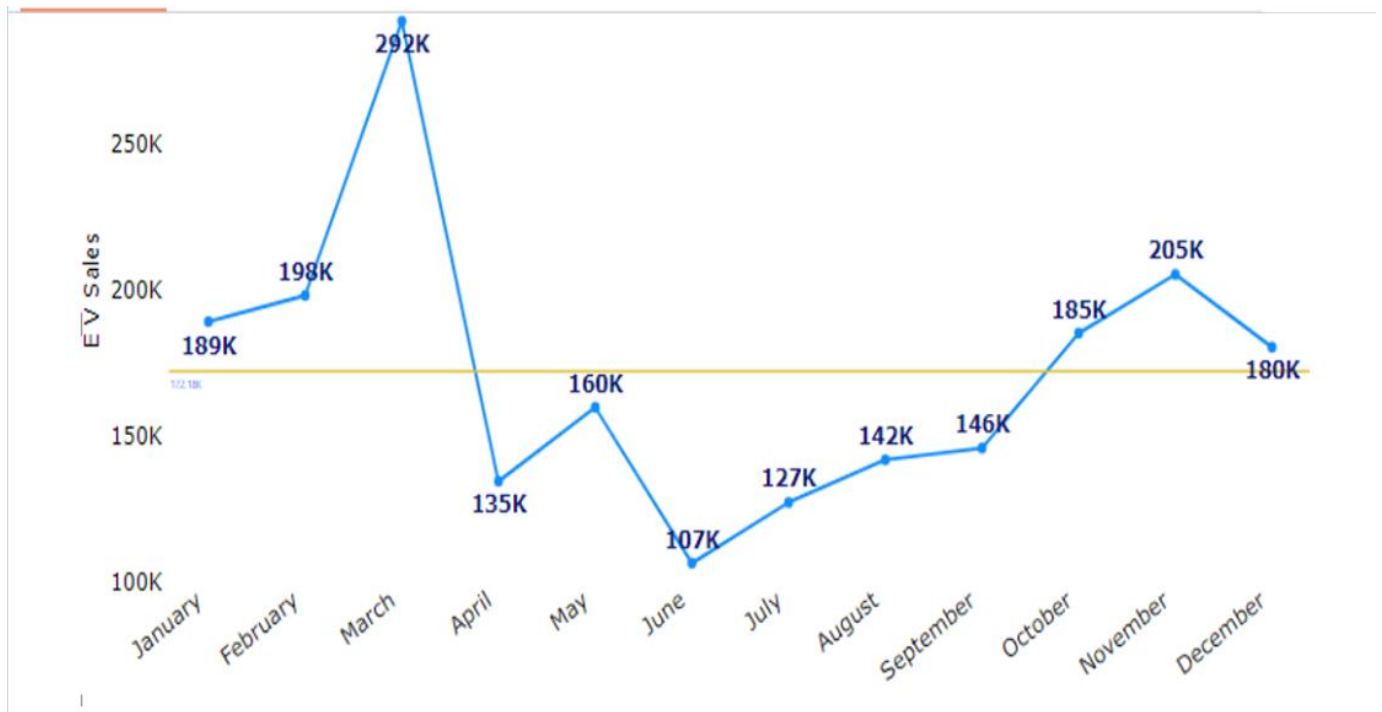
6. List down the compounded annual growth rate (CAGR) in 4-wheeler units for the top 5 makers from 2022 to 2024.



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



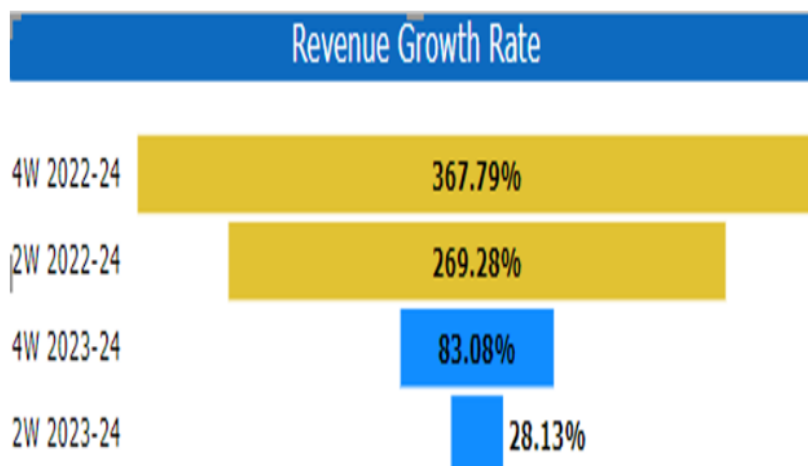
8. What are the peak and low season months for EV sales based on the data from 2022 to 2024?



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?

State	Projected Sales for 2030
Maharashtra	13.41M
Kerala	11.85M
Gujarat	8.54M
Karnataka	8.30M
Odisha	2.74M
Rajasthan	2.42M
Goa	2.38M
Tamil Nadu	1.58M
Delhi	1.05M
Chandigarh	1.00M

10. Estimate the revenue growth rate of 4-wheeler and 2-wheelers EVs in India for 2022 vs 2024 and 2023 vs 2024, assuming an average unit price. H



Secondary Research Questions:

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

Here are the primary reasons customers are choosing 4-wheeler EVs in 2023 and 2024, supported by relevant data:

Cost Savings:

- **Lower Operating Costs:** EVs generally have lower fuel and maintenance costs compared to internal combustion engine (ICE) vehicles. A study by Consumer Reports found that EV owners save an average of \$800 to \$1,000 per year on fuel alone.
- **Total Cost of Ownership (TCO):** A report by Deloitte indicates that the TCO of EVs is becoming more competitive with ICE vehicles, with many EVs expected to reach cost parity by 2023-2024 due to decreasing battery prices and lower operating costs.

Environmental Concerns:

- **Reduction in Emissions:** According to the International Energy Agency (IEA), EVs can reduce CO2 emissions by approximately 50% compared to traditional vehicles, even when accounting for the electricity generation mix.
- **Consumer Awareness:** A survey by McKinsey & Company revealed that 45% of consumers consider environmental impact as a key factor when purchasing an EV, reflecting a growing trend towards sustainability and reducing carbon footprints.

Government Incentives:

- **Financial Incentives:** Governments worldwide are offering substantial incentives to boost EV adoption. For example, the U.S. federal tax credit of up to \$7,500 for EV purchases and additional state-level incentives can significantly reduce the upfront cost for buyers.
- **Policy Support:** Many countries are implementing policies to phase out ICE vehicles and promote EVs. The European Union's Fit for 55 plan aims for a 100% reduction in CO2 emissions from new cars by 2035, which encourages consumers to switch to EVs.

Technological Advancements:

- **Improved Battery Technology:** Advancements in battery technology have increased the range and efficiency of EVs. According to BloombergNEF, the average range of EVs has increased by over 50% in the past five years, addressing range anxiety concerns.
- **Charging Infrastructure:** The expansion of charging infrastructure has made EV ownership more convenient. A report by the International Council on Clean Transportation (ICCT) noted a 40% increase in public charging points globally in 2023 alone.

These factors collectively contribute to the growing appeal of 4-wheeler EVs among consumers in 2023 and 2024.

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

Government incentives and subsidies play a crucial role in the adoption rates of electric vehicles (EVs), including both 2-wheelers and 4-wheelers. These incentives and subsidies can come in various forms, such as direct financial incentives, tax breaks, rebates, and non-financial incentives like access to bus lanes or free parking. Here's a detailed analysis of how these measures impact the adoption rates of 2-wheelers and 4-wheelers:

Impact on Adoption Rates

Reduction in Upfront Cost:

- **2-Wheelers:** Subsidies and incentives can significantly reduce the upfront cost of electric 2-wheelers, making them more affordable compared to their internal combustion engine (ICE) counterparts. Since 2-wheelers are generally less expensive than 4-wheelers, even small subsidies can make a substantial difference in consumer purchase decisions.
- **4-Wheelers:** The higher cost of electric 4-wheelers compared to ICE vehicles is a major barrier to adoption. Substantial subsidies and tax incentives can bridge this price gap, making EVs more competitive and attractive to consumers.

Total Cost of Ownership (TCO):

- **2-Wheelers:** Government incentives can reduce the overall TCO by lowering purchase prices and offering benefits like free or subsidized charging, reduced registration fees, and exemptions from road taxes. These benefits make electric 2-wheelers more economical over their lifetime.
- **4-Wheelers:** Similar incentives for 4-wheelers, including rebates on purchase prices, reduced registration fees, and lower running costs due to cheaper electricity compared to fuel, can make the TCO of EVs more appealing, encouraging adoption.

Infrastructure Development:

- **2-Wheelers:** Incentives for charging infrastructure development, such as subsidies for installing home chargers and public charging stations, can alleviate range anxiety and support the adoption of electric 2-wheelers.
- **4-Wheelers:** Government investments in widespread and fast-charging infrastructure are crucial for 4-wheelers due to their higher energy needs and longer travel ranges. Such infrastructure support can significantly boost consumer confidence and adoption rates.

Non-Financial Incentives:

- **2-Wheelers:** Non-financial incentives, like access to dedicated parking or charging stations, can make electric 2-wheelers more convenient to own and use, thus promoting their adoption.
- **4-Wheelers:** Benefits like access to carpool lanes, reduced tolls, and priority parking can make electric 4-wheelers more attractive to consumers, encouraging more people to switch from ICE vehicles.

Environmental Awareness and Policy:

- **2-Wheelers:** Government policies promoting clean air and reducing urban pollution can encourage the adoption of electric 2-wheelers, especially in densely populated cities where pollution levels are high.
- **4-Wheelers:** Stricter emissions regulations and policies aimed at reducing greenhouse gas emissions can drive the adoption of electric 4-wheelers. Public awareness campaigns highlighting the environmental benefits of EVs also play a significant role.

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

To analyse the correlation between the availability of charging stations and the EV sales and penetration rates in the top 5 states, we can look at how the number of charging stations might influence or relate to the number of EV sales and the penetration rates. Here is a step-by-step analysis:

Data Overview:

- EV Sales:
 - Maharashtra: 197,169
 - Karnataka: 160,989
 - Tamil Nadu: 94,314
 - Gujarat: 84,359
 - Kerala: 73,938
- Penetration Rate (%):
 - Maharashtra: 8.595
 - Karnataka: 10.17
 - Tamil Nadu: 5.4
 - Gujarat: 5.3
 - Kerala: 11.587
- Charging Stations:
 - Maharashtra: 3,079
 - Karnataka: 1,041
 - Tamil Nadu: 643
 - Gujarat: 476
 - Kerala: 852

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

Here are three potential brand ambassadors for AtliQ Motors' EV/Hybrid vehicles launch in India, supported by data:

- ✓ Virat Kohli:
 - Wide Reach and Influence: As one of the most popular and influential sports personalities in India, Virat Kohli has a massive following across social media platforms. He has over 250 million followers on Instagram, making him a powerful figure to reach a broad and diverse audience.
 - Environmental Advocacy: Virat Kohli has been vocal about environmental issues and sustainable living. His endorsement can align well with the eco-friendly message of EVs and hybrids, resonating with environmentally conscious consumers.
 - Youth Appeal: As a cricket icon, Kohli appeals to the younger generation, who are increasingly becoming key consumers of innovative and sustainable technologies. His association can help attract younger customers who are more likely to adopt new technologies like EVs and hybrids.
- ✓ Priyanka Chopra:
 - Global Influence: Priyanka Chopra is an internationally renowned actress and philanthropist with a significant influence both in India and globally. She has over 85 million followers on Instagram, providing extensive reach and visibility.
 - Advocate for Sustainability: Chopra has been involved in various environmental and sustainability initiatives. Her partnership with AtliQ Motors can emphasize the brand's commitment to sustainability and appeal to eco-conscious consumers.

- Appeal to Diverse Demographics: As a versatile actress and public figure, Priyanka Chopra appeals to a wide range of demographics, including both urban and rural audiences, making her an effective ambassador for reaching diverse consumer groups .

✓ Akshay Kumar:

- Mass Appeal: Akshay Kumar is one of the most popular and trusted actors in India, with a strong fan base across different age groups and regions. His endorsements are known to resonate well with the masses .
- Fitness and Health Advocate: Known for his focus on fitness and healthy living, Akshay Kumar's image aligns well with the clean and healthy benefits of EVs, appealing to consumers looking for sustainable and health-conscious choices .
- Proven Track Record: Kumar has successfully endorsed various products, including automobiles, and his association has often resulted in increased brand awareness and sales. His credibility and relatability make him a reliable choice for AtliQ Motors .

Choosing any of these ambassadors can significantly enhance the brand's visibility, credibility, and appeal to the target audience in India.

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

Tamil Nadu:

- Incentives:
 - ✓ 15% capital subsidy on eligible investments over 10 years
 - ✓ Special 20% capital subsidy for EV battery manufacturing
 - ✓ 100% electricity duty exemption
 - ✓ 15% land subsidy
 - ✓ 100% stamp duty exemption
 - ✓ Employment incentive
 - ✓ 6% interest subvention for EV components and charging manufacturing

Gujarat:

- Incentives:
 - ✓ Favourable business environment aligned with the Gujarat Industrial Policy 2020
 - ✓ Capital subsidies
 - ✓ 100% electricity duty exemption
 - ✓ Land conversion fee subsidies
 - ✓ 100% SGST reimbursement
 - ✓ 100% stamp duty exemption
 - ✓ Substantial interest subvention

Telangana:

- Incentives:
 - ✓ 20% capital investment subsidy up to INR 30 crore
 - ✓ 100% electricity duty exemption
 - ✓ 25% power tariff discount
 - ✓ Substantial SGST reimbursement
 - ✓ 100% stamp duty exemption
 - ✓ Interest subvention of 5.25% over 5 years

6. Your top 3 recommendations for AtliQ Motors.

Here are the top three recommendations for AtliQ Motors based on the Indian EV market:

- ✓ Leverage Government Incentives and Policies:
 - Utilize Subsidies and Tax Benefits: Take full advantage of the Indian government's subsidies and tax incentives for EVs. The Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (FAME) scheme offers significant financial incentives that can lower the cost for consumers, making AtliQ's vehicles more competitive. Promote these benefits in marketing campaigns to attract price-sensitive buyers.
 - Align with National Policies: Ensure that AtliQ's vehicle models meet the requirements of India's EV policies, such as those targeting emissions and fuel efficiency. Aligning with these regulations can also position AtliQ as a compliant and forward-thinking brand in the eyes of regulators and consumers.
- ✓ Focus on Affordability and Localized Features:
 - Offer Competitive Pricing: Given the price-sensitive nature of the Indian market, consider launching budget-friendly models alongside premium offerings. Competitive pricing can help capture a larger market share and appeal to a broader customer base.
 - Local Customization: Customize vehicle features to suit Indian driving conditions and consumer preferences. This can include robust suspension systems for diverse road conditions, efficient air conditioning systems for hotter climates, and features that appeal to tech-savvy consumers, such as advanced infotainment systems.
- ✓ Expand Charging Infrastructure and After-Sales Service:
 - Partnerships for Charging Stations: Collaborate with local governments, private enterprises, and existing charging network providers to expand the charging infrastructure. Ensuring widespread and accessible charging stations will alleviate range anxiety and make EVs more practical for everyday use.
 - Strengthen After-Sales Service Network: Develop a robust after-sales service network to ensure customer satisfaction and loyalty. Provide training to local technicians and set up service centers across key regions. Efficient and accessible after-sales service can significantly enhance the ownership experience and brand reputation.