Q1) List the top 3 and bottom 3 makers for the fiscal years 2023 and 2024 in terms of the number of 2-wheelers sold.

|  |  |  |  |
| --- | --- | --- | --- |
| Top3 |  | Bottom 3 |  |
| ATHER | 184473 | BATTRE ELECTRIC | 4841 |
| OLA ELECTRIC | 475072 | JITENDRA | 8563 |
| TVS | 262836 | KINETIC GREEN | 9585 |
|  |  |  |  |

Q2) Identify the top 5 states with the highest penetration rate in 2-wheeler and 4-wheeler EV sales in FY 2024.

|  |  |  |
| --- | --- | --- |
| States (Top 5) | Sum of electric\_vehicles\_sold | Average of Penetration Rate |
| Gujarat | 84359 | 4.272664453 |
| Karnataka | 160989 | 7.894095232 |
| Kerala | 73938 | 27.95975517 |
| Maharashtra | 197169 | 6.580636568 |
| Tamil Nadu | 94314 | 4.356254978 |

Q3) List the states with negative penetration (decline) in EV sales from 2022 to 2024?

|  |  |
| --- | --- |
| Andaman & Nicobar Island | Ladakh |
| -0.055968381 | -0.624316834 |

Q4) What are the quarterly trends based on sales volume for the top 5 EV makers (4-wheelers) from 2022 to 2024?

Q5) How do the EV sales and penetration rates in Delhi compare to Karnataka for 2024?

|  |  |  |
| --- | --- | --- |
| States | Sum of electric\_vehicles\_sold | Average of Penetration Rate |
| Delhi | 46724 | 6.98180921 |
| Karnataka | 160989 | 7.894095232 |
| Grand Total | **207713** | **7.437952221** |

Q6) List down the compounded annual growth rate (CAGR) in 4-wheeler units for the top 5 makers from 2022 to 2024.

|  |  |  |  |
| --- | --- | --- | --- |
| 2022 | 2023 | 2024 | CAGR |
| 33 | 920 | 350 | 5.818462 |
| 110 | 576 | 370 | 5.382504 |
| 4042 | 13805 | 4264 | 5.055049 |
| 1647 | 3277 | 2190 | 7.158305 |
| 12708 | 28046 | 13236 | 7.08248 |

Q7) List down the top 10 states that had the highest compounded annual growth rate (CAGR) from 2022 to 2024 in total vehicles sold.

|  |  |
| --- | --- |
| Andaman & Nicobar | 0 |
| Arunachal Pradesh | -0.164486123 |
| Assam | -0.160946654 |
| Delhi | -0.155817085 |
| Goa | -0.147845855 |
| Gujarat | -0.160164025 |
| Karnataka | -0.151521056 |
| Meghalaya | -0.146060832 |
| Mizoram | -0.163570789 |
| Rajasthan | -0.158375642 |

Q8) What are the peak and low season months for EV sales based on the data from 2022 to 2024?

COMMON PEAK MONTHS ARE NOVEMBER,DECEMBER,FEBRUARY,MARCH

Q10) 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.

|  |  |
| --- | --- |
|  | Revenue Growth Rate |
| 2024 vs 2022 | 2-Wheeler |
| 72.91999931 |
| 4-Wheeler |
| 78.62280066 |
|  |  |
| 2024 vs 2023 | 2-Wheeler |
| 21.95676601 |
| 4-Wheeler |
| 45.38037537 |

Q9)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 | CAGR | Year-2022 | Year-2023 | Year-2024 | EV 2030 |
| Chandigarh | 0.912931183 | 411 | 1991 | 2877 | 3205.456 |
| Delhi | 0.413769491 | 16535 | 44053 | 46724 | 49499.76 |
| Goa | 0.824528261 | 1778 | 7107 | 10799 | 11937.37 |
| Gujarat | 0.672671609 | 18026 | 79004 | 84359 | 91910.8 |
| Karnataka | 0.551443754 | 43111 | 108895 | 160989 | 173215 |
| Kerala | 0.756689706 | 13639 | 49483 | 73938 | 81217.61 |
| Maharashtra | 0.597382337 | 48374 | 150502 | 197169 | 213176.9 |
| Odisha | 0.602930991 | 9498 | 29651 | 39118 | 42318.39 |
| Rajasthan | 0.489979283 | 20087 | 63835 | 66444 | 71009.94 |
| Tamil Nadu | 0.367713591 | 36863 | 68885 | 94314 | 99366.96 |

Model= <https://colab.research.google.com/drive/17nylKl-FxfeeKHc9dqayYitHbaGHawvN?usp=sharing>

Q10) 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.

|  |  |
| --- | --- |
|  | Revenue Growth Rate |
| 2024 vs 2022 | 2-Wheeler |
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| 78.62280066 |
|  |  |
| 2024 vs 2023 | 2-Wheeler |
| 21.95676601 |
| 4-Wheeler |
| 45.38037537 |

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

* **Cost Savings**: Electric vehicles (EVs) offer lower operational costs compared to traditional vehicles due to savings on fuel and lower maintenance expenses.
* **Environmental Concerns**: Customers are increasingly motivated by the desire to reduce their carbon footprint, as EVs produce zero carbon emissions, aligning with global sustainability efforts.
* **Government Incentives**: Subsidies, tax breaks, and incentives such as the Faster Adoption and Manufacturing of Electric Vehicles (FAME) scheme in India reduce the upfront cost of EVs, making them more appealing.

**2. Impact of Government Incentives on Adoption Rates**

* Government subsidies play a crucial role in reducing the high initial costs of EVs, encouraging adoption. For instance, 2-wheeler adoption is particularly strong in states that provide incentives for battery costs and offer exemptions on registration fees.
* **Top Subsidizing States**: States such as **Delhi**, **Maharashtra**, and **Gujarat** offer significant subsidies and incentives to boost both 2-wheeler and 4-wheeler EV adoption.

**3. Correlation of Charging Stations with EV Sales in Top 5 States**

* **Availability of Charging Infrastructure**: States with a higher number of charging stations generally see higher EV sales and penetration rates. For example, states like **Gujarat**, **Karnataka**, and **Maharashtra** have strong charging infrastructure development, correlating with high sales​
* The presence of easily accessible charging stations reduces range anxiety, a significant barrier for potential EV buyers.

**4. Potential Brand Ambassador for AtliQ Motors**

* **Recommended Brand Ambassador**: A good option would be someone like **Virat Kohli** or **MS DHONI**. Both are widely respected for their achievements and have global recognition, aligning with sustainability efforts.

**5. Ideal State to Start Manufacturing Unit**

* **Maharashtra** is ideal due to its strong industrial base, significant subsidies for EV production, and ease of doing business. Additionally, the state provides good infrastructure and a skilled workforce. **Gujarat** is another viable option with favorable policies and excellent industrial infrastructure​.

**6. Top 3 Recommendations for AtliQ Motors**

1. **Expand Charging Infrastructure**: Partner with governments and private companies to establish widespread charging stations, addressing the main barrier of range anxiety.
2. **Focus on Tier-2 and Tier-3 Cities**: These cities are ripe for EV adoption, where competition is lower and consumers are becoming more environmentally conscious.
3. **Leverage Government Policies**: Take full advantage of subsidies and tax incentives available at both central and state levels to reduce production costs and pass on savings to customers.