

# Ev Data: Power Insights

SQL Drives EV Analysis

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# Objective:

- Provide insights and findings based on the data analysis
- Translate raw data into visual formats for easier interpretation.
- Aid stakeholders in market informed decision.
- Asses various performance indicators related to electric vehicles.
- Discuss Key finding and insights derived from the data.



# Scope :

- Provide insights and finding based on the data analysis.
- Translate raw data into visual format for easier interpretation.
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- Assess various performance indicators related to electric vehicles.
- Discuss key findings and insights derived from the data






# Tools And Technologies:

- SQL Database: To store query and data
- Data Visualization Tools : Such as Excel, embedded chart features in PowerPoint to create visuals and MySQL Workbench
- Presentation Software: Microsoft PowerPoint for creating the slides.

Q1- Write a query to list all electric vehicles with their VIN (1-10), Make, and Model.


43 #1 Write a query to list all electric vehicles with their VIN (1-10), Make, and Model.

44 • `select distinct VIN, Make, Model from EV_data;`

Result Grid		 Filter Rows: <input type="text"/>	Export: 	Wrap Cell Content: 	Fetch rows: 
	VIN	Make	Model		
▶	WBY8P6C58K	BMW	I3		
	5YJSA1DN4D	TESLA	MODEL S		
	5YJSA1E26J	TESLA	MODEL S		
	WBY2Z2C54E	BMW	I8		
	5YJXCDE23J	TESLA	MODEL X		
	WBY33AW0XP	BMW	I4		
	5YJ3E1EB5L	TESLA	MODEL 3		
	1V2GNPE86P	VOLKSWAGEN	ID.4		
	WVWPP7AU0G	VOLKSWAGEN	E-GOLF		

Q2 -Write a query to display all columns for electric vehicles with a Model Year 2020 or later.

```
46 #2. Write a query to display all columns for electric
47 #vehicles with a Model Year of 2020 or later.
48 • select * from EV_data where `Model Year` >=2020;
```

Result Grid								
Filter Rows: <input type="text"/>								
Export:  Wrap Cell Content:  Fetch rows: 								
	VIN	County	City	State	Postal Code	Model Year	Make	Model
▶	WBY33AW0XP	King	Seattle	WA	98109	2023	BMW	I4
	5YJ3E1EB5L	King	Bothell	WA	98011	2020	TESLA	MODEL 3
	1V2GNPE86P	King	Sammamish	WA	98075	2023	VOLKSWAGEN	ID.4
	5YJ3E1EB0M	Yakima	Yakima	WA	98908	2021	TESLA	MODEL 3
	SADHD2S10L	King	Bellevue	WA	98004	2020	JAGUAR	I-PACE
	5YJYGAE8M	Snohomish	Snohomish	WA	98296	2021	TESLA	MODEL Y
	5YJ3E1EB6L	King	Redmond	WA	98052	2020	TESLA	MODEL 3
	WBY33AW0XP	King	Seattle	WA	98109	2023	BMW	I4

Q3- Write a query to list electric vehicles manufactured by Tesla.

```
50 #3Write a query to list electric vehicles manufactured by Tesla.
51 • select * from ev_data where make = 'TESLA';
```

Result Grid



Filter Rows:

Export:



Wrap Cell Content:



Fetch rows:



	VIN	County	City	State	Postal Code	Model Year	Make	Model	Electric Vehicle Type
	7SAYGDEE0P	King	Sammamish	WA	98075	2023	TESLA	MODEL Y	Battery Electric Vehicle (BEV)
	5YJ3E1EA5M	King	Kirkland	WA	98033	2021	TESLA	MODEL 3	Battery Electric Vehicle (BEV)
	5YJSA1E2XH	King	Seattle	WA	98107	2017	TESLA	MODEL S	Battery Electric Vehicle (BEV)
	7SAYGDEE4P	King	Bellevue	WA	98004	2023	TESLA	MODEL Y	Battery Electric Vehicle (BEV)
	5YJ3E1EC0P	King	Bellevue	WA	98004	2023	TESLA	MODEL 3	Battery Electric Vehicle (BEV)
	5YJYGDEFXM	Clark	Camas	WA	98607	2021	TESLA	MODEL Y	Battery Electric Vehicle (BEV)
▶	5YJYGDEE7M	King	Redmond	WA	98052	2021	TESLA	MODEL Y	Battery Electric Vehicle (BEV)



Q4 - Write a query to find all electric vehicles where the Model contains the word Leaf.

```
53 #4. Write a query to find all electric vehicles
54 #where the Model contains the word Leaf.
55 • select distinct* from ev_data
56 |where Model like "%Leaf%";
```

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

	VIN	County	City	State	Postal Code	Model Year	Make	Model
	JN1AZ0CP2C	Cowlitz	Longview	WA	98632	2012	NISSAN	LEAF
	JN1AZ0CP3B	Snoho...	Bothell	WA	98012	2011	NISSAN	LEAF
	1N4AZ0CP8F	King	Seattle	WA	98122	2015	NISSAN	LEAF
	1N4BZ1CV1M	Kitsap	Bremerton	WA	98337	2021	NISSAN	LEAF
	1N4AZ1CP4J	King	Seattle	WA	98125	2018	NISSAN	LEAF
	1N4AZ0CP4D	King	Shoreline	WA	98133	2013	NISSAN	LEAF
▶	1N4AZ1CP9K	Thurston	Olympia	WA	98501	2019	NISSAN	LEAF



Q5- Write a query to count the total number of electric vehicles in the dataset.

```
58 #5. Write a query to count the total number  
59 # of electric vehicles in the dataset.  
60 • select count(distinct Vin) as Total_EV_count from ev_data;  
61
```

Result Grid			Filter Rows: <input type="text"/>	Export: 	Wrap Cell Content: 
	Total_EV_count				
▶	11242				

Q6- Write a query to find the average Electric Range of all electric vehicles

```
63  #Write a query to find the average
64  #Electric Range of all electric vehicles.
65  •  select Avg(`Electric Range`)
66     as average_Electric_Range from ev_data;
67
```

Result Grid



Filter Rows:

Export:







Wrap Cell Content:



	average_Electric_Range
▶	56.7078






**Q7** - Write a query to list the top 5 electric vehicles with the highest Base MSRP, sorted in descending order.

```
68 #Q7 Write a query to list the top 5 electric vehicles
69 #with the highest Base MSRP, sorted in descending order.
70 • SELECT distinct VIN, `Model Year`, Make, Model,
71     `Base MSRP` FROM EV_data
72     ORDER BY `Base MSRP` DESC
73     LIMIT 5;
74
75
```

Result Grid    Filter Rows: <input type="text"/>   Export:    Wrap Cell Content:    Fetch rows: 					
	VIN	Model Year	Make	Model	Base MSRP
•	WP0CA2A13F	2015	PORSCHE	918	845000.00
	WP0AH2A70J	2018	PORSCHE	PANAMERA	184400.00
	WP0AH2A71J	2018	PORSCHE	PANAMERA	184400.00
	WP0AH2A73J	2018	PORSCHE	PANAMERA	184400.00
	WP0AH2A74J	2018	PORSCHE	PANAMERA	184400.00

**Q8** - Write a query to list all pairs of electric vehicles that have the same Make and Model Year. Include columns for VIN\_1, VIN\_2, Make, and Model Year.




```
6   #Write a query to list all pairs of electric vehicles that have the same Make and Model Year.
7   #Include columns for VIN_1, VIN_2, Make, and Model Year.
8 •  Select E1.VIN As VIN_1, E2.VIN As VIN_2, E1.Make, E1.`Model Year`
9   From EV_data E1
10  Join EV_data E2 On E1.Make = E2.Make
11      And E1.`Model Year` = E2.`Model Year`
12      And E1.VIN < E2.VIN;
```

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

VIN_1	VIN_2	Make	Model Year
WBAJB1C53K	WBY8P6C58K	BMW	2019
WBAJB1C50K	WBY8P6C58K	BMW	2019
WBY8P4C52K	WBY8P6C58K	BMW	2019
WBY8P4C50K	WBY8P6C58K	BMW	2019
WBAJB1C58K	WBY8P6C58K	BMW	2019
WBAJA9C51K	WBY8P6C58K	BMW	2019




Q9- Write a query to find the total number of electric vehicles for each Make. Display Make and the count of vehicles

```
81 • SELECT Make, count(*) as Vehicle_Count FROM ev_data  
82 GROUP BY Make ORDER BY Vehicle_Count;
```

<		
Result Grid     Filter Rows: <input type="text"/>   Export:    Wrap Cell Co		
	Make	Vehicle_Count
▶	ROLLS ROYCE	2
	WHEEGO ELECTRIC CARS	3
	BENTLEY	3
	GMC	4
	THINK	5

**Q10-** Write a query using a CASE statement to categorize electric vehicles into three categories based on their Electric Range: Short Range for ranges less than 100 miles, Medium Range for ranges between 100 and 200 miles, and Long Range for ranges more than 200 miles

```
92 • SELECT `VIN (1-10)`, Make, `Electric Range`, CASE
93     WHEN `electric range` < 100 THEN 'SHORT_RANGE'
94     WHEN `electric range` BETWEEN 100 AND 200 THEN 'MIDDLE_RANGE'
95     ELSE 'LONG_RANGE'
96     END AS TYPE_
97 FROM ev_data ORDER BY `electric range`;
```

Result Grid    Filter Rows: <input type="text"/>   Export:    Wrap Cell Content:    Fetch rows				
	VIN (1-10)	Make	Electric Range	TYPE_
	WBY7Z4C50J	BMW	97	SHORT_RANGE
	WBY1Z8C36H	BMW	97	SHORT_RANGE
	1FADP3R47H	FORD	100	MIDDLE_RANGE
	1FADP3R44H	FORD	100	MIDDLE_RANGE
	1FADP3R43J	FORD	100	MIDDLE_RANGE



**Q11-** Write a query to add a new column Model\_Length to the electric vehicles table that calculates the length of each Model name

```
103 • ALTER TABLE ev_data ADD COLUMN `Model Length` INT;  
104 • UPDATE ev_data SET `Model length`=LENGTH(model);  
105 • SELECT model,`Model Length` FROM ev_data;
```

<

Result Grid



Filter Rows:

Export:



Wrap Cell Co

	model	Model Length
▶	I3	2
	MODEL S	7
	MODEL S	7
	I8	2
	MODEL X	7

Q12- Write a query using an advanced function to find the electric vehicle with the highest Electric Range.

```
111 • SELECT Model, `Electric Range`  
112 FROM (  
113     SELECT Model,  
114           `Electric Range`,  
115           ROW_NUMBER() OVER (ORDER BY `Electric Range` DESC) AS rn FROM ev_data) v  
116 WHERE rn=1;
```



Result Grid



Filter Rows:

Export:



Wrap Cell Content:



	Model	Electric Range
▶	MODEL S	337

# Q13

- Create a view named High End Vehicles that includes electric vehicles with a Base MSRP of \$50,000 or higher.

```

136 #13.Create a view named HighEndVehicles that includes
137 #electric vehicles with a Base MSRP of $50,000 or higher.
138 • create view HighEndVehicles2 as
139 (select distinct VIN, Make, Model, `Electric Vehicle Type` , `Base MSRP`
140 from EV_data
141 where `Base MSRP` > 50000);
142 • select * from HighEndVehicles2;

```

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

	VIN	Make	Model	Electric Vehicle Type	Base MSRP
•	5YJSA1DN4D	TESLA	MODEL S	Battery Electric Vehicle (BEV)	69900.00
	5YJSA1H19E	TESLA	MODEL S	Battery Electric Vehicle (BEV)	69900.00
	5YJSA1CN8D	TESLA	MODEL S	Battery Electric Vehicle (BEV)	69900.00
	5YJSA1H11E	TESLA	MODEL S	Battery Electric Vehicle (BEV)	69900.00
	5YJSA1DN8C	TESLA	MODEL S	Battery Electric Vehicle (BEV)	59900.00
	LYVBR0DM7K	VOLVO	XC60	Plug-in Hybrid Electric Vehicle (PHEV)	52900.00
	5YJSA1DN1D	TESLA	MODEL S	Battery Electric Vehicle (BEV)	69900.00
	5YJSA1C0V8	TESLA	MODEL S	Battery Electric Vehicle (BEV)	69900.00

**Q14-** Write a query using a window function to rank electric vehicles based on their Base MSRP within each Model Year.

```
144 #14#Write a query using a window function to rank electric
145 #vehicles based on their Base MSRP within each Model Year.
146 • Select distinct VIN, Make, Model, `model year`, `Base MSRP`,
147     RANK() OVER ( Partition by `model year`
148                   order by `Base MSRP` DESC) as Ranking
149 FROM EV data;
```

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

	VIN	Make	Model	model year	Base MSRP	Ranking
▶	1GCDE14HXV	CHEVROLET	S-10 PICKUP	1997	0.00	1
	1FTZR1078W	FORD	RANGER	1998	0.00	1
	1FTZR0819X	FORD	RANGER	1999	0.00	1
	1FTZR0812X	FORD	RANGER	1999	0.00	1
	1FTZR0813X	FORD	RANGER	1999	0.00	1
	1FTZR0818X	FORD	RANGER	1999	0.00	1
	1FTZR0870Y	FORD	RANGER	2000	0.00	1
	1FTZR0812X	FORD	RANGER	2000	0.00	1

Result 75

Q15 - Write a query to calculate the cumulative count of electric vehicles registered each year sorted by Model Year.

```
141 • SELECT `Model Year`, count(*) as year_count,  
142         SUM(COUNT(*)) OVER (order by `model year`) as cumulative_count  
143 FROM ev_data  
144 group by `model year`;
```

<

Result Grid



Filter Rows:

Export:



Wrap Cell Content:



	Model Year	year_count	cumulative_count
▶	1997	1	1
	1998	1	2
	1999	5	7
	2000	7	14
	2001	2	16

# Q16 -

Write a stored procedure to update the Base MSRP of a vehicle given its VIN (1-10) and new Base MSRP

```
149 DELIMITER //
150 • CREATE PROCEDURE Update_msrp(IN a text, IN b INT)
151 • BEGIN
152     UPDATE ev_data SET `base msrp`=b WHERE `VIN (1-10)`=a;
153 • END //
154 DELIMITER ;
155
156 • CALL update_msrp('WBY8P6C58K',5000);
157 • SELECT `VIN (1-10)`,`base msrp` FROM ev_data;
```



Result Grid



Filter Rows:

Export:



Wrap Cell Content:



	VIN (1-10)	base msrp
▶	WBY8P6C58K	5000.00



**Q17** - Write a query to find the county with the highest average Base MSRP for electric vehicles. Use subqueries and aggregate functions to achieve this

```
165 • SELECT COUNTY,AVG_  
166 FROM (  
167     SELECT county,AVG(`base msrp`) as AVG_  
168     FROM ev_data  
169     GROUP BY county  
170 ) AS t  
171 ORDER BY AVG_ DESC  
172 LIMIT 1;
```

<		
Result Grid		
Filter Rows:		
Export:		
Wrap Cell Co		
	COUNTY	AVG_
▶	Charles	102000.000000

**Q18** - Write a query to find pairs of electric vehicles from the same City where one vehicle has a longer Electric Range than the other. Display columns for VIN\_1, Range\_1, VIN\_2, and Range\_2.

```
9 • SELECT ev1.city as city_,
      ev1.`VIN (1-10)` as VIN_1, ev1.`electric range` as Range_1,
      ev2.`VIN (1-10)` as VIN_2, ev2.`electric range` as Range_2
1 FROM ev_data ev1
2 JOIN ev_data ev2
3 ON ev1.city=ev2.city AND ev1.`electric range` > ev2.`electric range`;
```

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

city_	VIN_1	Range_1	VIN_2	Range_2
Seattle	5YJSA1E45J	249	WBY8P6C58K	153
Seattle	5YJYGDEE0L	291	WBY8P6C58K	153
Seattle	5YJSA1DP2D	208	WBY8P6C58K	153
Seattle	5YJXCAE27J	238	WBY8P6C58K	153
Seattle	1G1FZ6S07L	259	WBY8P6C58K	153