

Data Analysis Project on Electric  
Vehicles Sales in SQL  
By  
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## Table Name: electric\_vehicles

- Total number of rows: 1,86,879
- This dataset contains detailed information about electric vehicles registered in a certain region.
- Each record represents an individual electric vehicle and includes various attributes such as location, vehicle specifications, and utility details.
- The dataset can be used to analyze trends in electric vehicle adoption, geographic distribution, and the characteristics of different electric vehicle models.



### Columns Description:

► VIN (Vehicle Identification Number): A unique identifier for each vehicle, typically composed of 17 characters, but this dataset seems to be using the first 10 characters.

County: The county in which the vehicle is registered.

City: The city in which the vehicle is registered.

State: The state in which the vehicle is registered.

Postal Code: The postal code for the vehicle's registration address. Model Year: The year the vehicle model was manufactured. Make: The manufacturer or brand of the vehicle (e.g., Tesla, Nissan).

Model: The specific model name or number of the vehicle.

Electric Vehicle Type: The type of electric vehicle (e.g., Battery Electric Vehicle (BEV), Plug-in Hybrid Electric Vehicle (PHEV)).

► Clean Alternative Fuel Vehicle (CAFV) Eligibility: Indicates whether the vehicle is eligible for clean alternative fuel vehicle incentives.



- **Objective:** To analyze electric vehicle sales data and derive meaningful insights using SQL.

- **Scope:**

- Data Extraction and Transformation
- Sales Trends and Growth Analysis
- Top Models and Manufacturers
- Range Analysis

- **Tools Used:** SQL



```
6 # Subrato # Q1. 1. Write a query to list all electric vehicles with their VIN (1-10), Make, and Model.
7 • select VIN,make,model from electric_vehicle; |
8 • DESC ELECTRIC_VEHICLE;
9 • select count(*) from electric_vehicle;
```

Result Grid



Filter Rows:

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
3C3CFFGE8D	FIAT	500



12

13 # Subrato Q2. Write a query to display all columns for electric vehicles with a Model Year of 2020 or later.

14 • `select * from electric_vehicle where model_year between 2020 and 2024 order by model_year;`

15

Result Grid



Filter Rows:

Export:



Wrap Cell Content:



Fetch rows:



	VIN	County	City	State	Postal Code	Model_Year	Make	Model	Electric_Vehide_Type	Clean Alternative Fuel Vehicle (CAFV) Eligibility
▶	5YJ3E1EBXL	Pierce	Puyallup	WA	98374	2020	TESLA	MODEL 3	Battery Electric Vehicle (BEV)	Clean Alternative Fuel Vehicle Eligible
	1G1FZ6S06L	Island	Langley	WA	98260	2020	CHEVROLET	BOLT EV	Battery Electric Vehicle (BEV)	Clean Alternative Fuel Vehicle Eligible
	1G1FZ6S06L	King	Seattle	WA	98115	2020	CHEVROLET	BOLT EV	Battery Electric Vehicle (BEV)	Clean Alternative Fuel Vehicle Eligible
	2C4RC1N73L	King	Pacific	WA	98047	2020	CHRYSLER	PACIFICA	Plug-in Hybrid Electric Vehide (PHEV)	Clean Alternative Fuel Vehicle Eligible
	5YJYGDEE8L	King	Redmond	WA	98053	2020	TESLA	MODEL Y	Battery Electric Vehicle (BEV)	Clean Alternative Fuel Vehicle Eligible
	5YJ3E1EA0L	King	Renton	WA	98058	2020	TESLA	MODEL 3	Battery Electric Vehicle (BEV)	Clean Alternative Fuel Vehicle Eligible
	WBY8P2C0XL	Pierce	Tacoma	WA	98405	2020	BMW	I3	Battery Electric Vehicle (BEV)	Clean Alternative Fuel Vehicle Eligible
	5YJYGDEF8L	King	Federal Way	WA	98023	2020	TESLA	MODEL Y	Battery Electric Vehide (BEV)	Clean Alternative Fuel Vehicle Eligible
	5YJ3E1EBXL	Pierce	Puyallup	WA	98374	2020	TESLA	MODEL 3	Battery Electric Vehicle (BEV)	Clean Alternative Fuel Vehicle Eligible



```
16
17 # Subrato Q3. 3. Write a query to list electric vehicles manufactured by Tesla.
18 • select VIN,MODEL,Make FROM electric_vehicle where make in("TESLA");
```

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

	VIN	MODEL	Make
▶	5YJSA1DN4D	MODEL S	TESLA
	5YJSA1E26J	MODEL S	TESLA
	5YJXCDE23J	MODEL X	TESLA
	5YJ3E1EB5L	MODEL 3	TESLA
	5YJ3E1EB0M	MODEL 3	TESLA
	5YJSA1E29J	MODEL S	TESLA
	5YJ3E1EBXJ	MODEL 3	TESLA
	5YJXCBE25H	MODEL X	TESLA
	5YJ3E1EB9K	MODEL 3	TESLA
	5YJYGAE8M	MODEL Y	TESLA

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```
21 # Subrato q4. Write a query to find all electric vehicles where the Model contains the word Leaf.  
22 • select VIN,MODEL From electric_vehicle where model like "%leaf%";  
23
```

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

VIN_1	VIN_2	Make	model_year
WBY8P6C5XK	WBY8P6C58K	BMW	2019
WBAJB1C53K	WBY8P6C58K	BMW	2019
WBAJB1C50K	WBY8P6C58K	BMW	2019
WBY8P4C52K	WBY8P6C58K	BMW	2019
WBY8P4C50K	WBY8P6C58K	BMW	2019
WBY8P8C59K	WBY8P6C58K	BMW	2019
WBAJB1C58K	WBY8P6C58K	BMW	2019
WBAJA9C51K	WBY8P6C58K	BMW	2019
WBAJA9C57K	WBY8P6C58K	BMW	2019
WBY8P4C51K	WBY8P6C58K	BMW	2019

Result 145 x



```
22
23
24 # Subrato Q5. Write a query to count the total number of electric vehicles in the dataset.
25 • select count(*) as total_electric_vehicles from electric_vehicle;
26
```

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

	VIN_1	VIN_2	Make	model_year
▶	WBY8P6C5XK	WBY8P6C58K	BMW	2019
	WBAJB1C53K	WBY8P6C58K	BMW	2019
	WBAJB1C50K	WBY8P6C58K	BMW	2019
	WBY8P4C52K	WBY8P6C58K	BMW	2019
	WBY8P4C50K	WBY8P6C58K	BMW	2019
	WBY8P8C59K	WBY8P6C58K	BMW	2019
	WBAJB1C58K	WBY8P6C58K	BMW	2019
	WBAJA9C51K	WBY8P6C58K	BMW	2019
	WBAJA9C57K	WBY8P6C58K	BMW	2019
	WBY8P4C51K	WBY8P6C58K	BMW	2019



23

24 # Subrato Q6. Write a query to find the average Electric Range of all electric vehicles.

25 • `select Round(AVG(Electric_range),2) as Average_Electric_Range from electric_vehicle;`

26

27

28

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

Average_Electric_Range
------------------------

56.68
-------



26

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

28 •     select VIN, Model from electric\_vehicle order by base\_msrp desc limit 5;

29

30

31

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

VIN	Model
WP0CA2A13F	918
WP0CH2A76J	PANAMERA
WP0AH2A77J	PANAMERA
WP0CH2A75J	PANAMERA
WP0AH2A71J	PANAMERA



```

32
33 # Subrato Q8. Write a query to list all pairs of electric vehicles that have the same Make and Model Year. Include columns
34 # for VIN_1, VIN_2, Make, and Model Year.
35 • select e1.VIN as VIN_1, e2.VIN as VIN_2, e1.Make, e1.model_year from electric_vehicle_new e1 join electric_vehicle_new e2
36 on e1.make=e2.make and e1.model_year =e2.model_year;
37
38

```

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

VIN_1	VIN_2	Make	model_year
WBY8P6C5XK	WBY8P6C58K	BMW	2019
WBAJB1C53K	WBY8P6C58K	BMW	2019
WBAJB1C50K	WBY8P6C58K	BMW	2019
WBY8P4C52K	WBY8P6C58K	BMW	2019
WBY8P4C50K	WBY8P6C58K	BMW	2019
WBY8P8C59K	WBY8P6C58K	BMW	2019
WBAJB1C58K	WBY8P6C58K	BMW	2019
WBAJA9C51K	WBY8P6C58K	BMW	2019
WBAJA9C57K	WBY8P6C58K	BMW	2019
WBY8P4C51K	WBY8P6C58K	BMW	2019



```
31
32     # Subrato Q9. Write a query to find the total number of electric vehicles for each Make. Display Make and the count of vehicles.
33 •   Select Make, count(make) as count_of_vehicles from electric_vehicle group by make;
34
35
36
```

Result Grid  Filter Rows:  Export:  Wrap Cell Content: 

	Make	count_of_vehides
▶	BMW	7843
	TESLA	83149
	VOLKSWAGEN	5286
	FIAT	784
	NISSAN	14168
	CHEVROLET	14046
	KIA	7875
	JAGUAR	232
	SMART	260



```

36  #Subrato Q 10. 10. Write a query using a CASE statement to categorize electric vehicles into three categories based on their Electric Range:
37  # 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.
38  • select VIN,Electric_range,case
39      when electric_range <100 then "Short_Range"
40      when electric_range >= 100 and electric_range <= 200 then "Medium_Range"
41      else "Long_range"
42  END as Electric_range_type
43  from electric_vehicle;

```

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

	VIN	Electric_range	Electric_range_type
▶	WBY8P6C58K	153	Medium_Range
	5YJSA1DN4D	208	Long_range
	5YJSA1E26J	249	Long_range
	WBY2Z2C54E	14	Short_Range
	5YJXCDE23J	238	Long_range
	WBY33AW0XP	0	Short_Range
	5YJ3E1EB5L	322	Long_range
	1V2GNPE86P	0	Short_Range
	WVWPP7AU0G	83	Short_Range
	3C3CFFGE8D	87	Short_Range



```

45 # Q.11. Write a query to add a new column Model_Length to the electric vehicles table that calculates the length of each Model name.
46 • select * from electric_vehicle;
47 • alter table electric_vehicle add column model_length int;
48 • select * from electric_vehicle;

```


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

Can Alternative Fuel Vehicle (CAEV) Eligibility	Electric_Range	Base_MSRP	Legislative_District	DOL_VehicleID	Vehicle_Location	Electric_Utility	2020_Census_Tract	model_length
Can Alternative Fuel Vehicle Eligible	153	0	43	259254397	POINT (-122.3008235 47.6862671)	CITY OF SEATTLE - (WA) CITY OF TACOMA - (...)	53033003601	NULL
Can Alternative Fuel Vehicle Eligible	208	69900	35	127420940	POINT (-122.6961203 47.5759584)	PUGET SOUND ENERGY INC	53035080700	NULL
Can Alternative Fuel Vehicle Eligible	249	0	47	170287183	POINT (-122.1145138 47.3581107)	PUGET SOUND ENERGY INC CITY OF TACOMA ...	53033031708	NULL
Eligible due to low battery range	14	0	41	205545868	POINT (-122.202397 47.619252)	PUGET SOUND ENERGY INC CITY OF TACOMA ...	53033024002	NULL
Can Alternative Fuel Vehicle Eligible	238	0	41	237977386	POINT (-122.202397 47.619252)	PUGET SOUND ENERGY INC CITY OF TACOMA ...	53033023601	NULL
Eligibility unknown as battery range has not been...	0	0	36	238283545	POINT (-122.3441532 47.6305366)	CITY OF SEATTLE - (WA) CITY OF TACOMA - (...)	53033007002	NULL
Can Alternative Fuel Vehicle Eligible	322	0	1	123837269	POINT (-122.201408 47.754528)	PUGET SOUND ENERGY INC CITY OF TACOMA ...	53033021804	NULL
Eligibility unknown as battery range has not been...	0	0	41	266068799	POINT (-122.0181135 47.5880568)	PUGET SOUND ENERGY INC CITY OF TACOMA ...	53033032224	NULL
Can Alternative Fuel Vehicle Eligible	0	0	48	155900308	POINT (-122.202397 47.619252)	PUGET SOUND ENERGY INC CITY OF TACOMA ...	53033024001	NULL

electric\_vehicle 78 x



```
50 # Subrato Q12. Write a query using an advanced function to find the electric vehicle with the highest Electric Range.
51 • with Highest_Electric_Range as (select *, row_number() over( order by electric_range desc) as rnk_value from electric_vehicle)
52 select VIN, Make, model, Electric_range from highest_electric_range where rnk_value =1;
53
```

Result Grid  Filter Rows:  Export:  Wrap Cell Content: 

	VIN	Make	model	Electric_range
▶	5YJSA1E4XL	TESLA	MODEL S	337



```
54
55 # Subrato Q13. Create a view named HighEndVehicles that includes electric vehicles with a Base MSRP of $50,000 or higher.
56 • create view HighEndVehicles as Select Vin,Model,Make from electric_vehicle where base_MSRP >=50000;
57 • select * from highendvehicles;
58
59
60
```




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

	Vin	Model	Make
▶	5YJSA1DN4D	MODEL S	TESLA
	5YJSA1H19E	MODEL S	TESLA
	5YJSA1CN8D	MODEL S	TESLA
	5YJSA1H11E	MODEL S	TESLA
	5YJSA1H19E	MODEL S	TESLA
	5YJSA1DN8C	MODEL S	TESLA
	LYVBR0DM7K	XC60	VOLVO
	5YJSA1DN1D	MODEL S	TESLA
	5YJSA1CGXD	MODEL S	TESLA
	5YJSA1H12E	MODEL S	TESLA



```
57
58 # Subrato 14. Write a query using a window function to rank electric vehicles based on their Base MSRP within each Model Year.
59 • Select Model,model_year,Base_MSRP, dense_RANK() OVER ( Partition by model_year order by Base_MSRP desc ) as Ranking_value from electric_vehicle;
60
```

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

	Model	model_year	Base_MSRP	Ranking_value
▶	S-10 PICKUP	1997	0	1
	RANGER	1998	0	1
	RANGER	1999	0	1
	RANGER	1999	0	1
	RANGER	1999	0	1
	RANGER	1999	0	1
	RANGER	1999	0	1
	RANGER	2000	0	1
	RANGER	2000	0	1
	RANGER	2000	0	1

Result 105 x



```

60
61 # Subrato Q.15. Write a query to calculate the cumulative count of electric vehicles registered each year sorted by Model Year.
62 • select * from electric_vehicle;
63
64 • SELECT Model_Year,count(*) as year_count,
65         SUM(COUNT(*)) OVER (order by model_year) as cumulative_count
66 FROM electric_vehicle

```

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
	2002	2	16
	2003	1	17
	2008	20	37
	2010	24	61
	2011	757	818
	2012	1589	2407

Result 106 x



```
69  # Q16. 16. Write a stored procedure to update the Base MSRP of a vehicle given its VIN (1-10) and new Base MSRP.
70  Delimiter //
71  • Create procedure base_update ( in a Text , in b int)
72  • begin
73    update electric_vehicle set Base_msrp= b where VIN = a;
74  • end //
75  delimiter ;
76  • call base_update("upknbcf",477890 );
77
78
```



```
78 # Subrato 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.
79 • select * from electric_vehicle;
80 • select county, average_ from ( select county,avg(base_msrp) as average_ from electric_vehicle group by county ) as t order by average_ desc limit 1;
81
82
83
```

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


	county	average_
▶	Columbia	4992.8571



```
83
84 # Subrato 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
85 #for VIN_1, Range_1, VIN_2, and Range_2.
86 • select e1.VIN AS VIN_1, e1.electric_range as range_1, e2.VIN AS VIN_2, e2.Electric_range as range_2 from electric_vehicle_new e1 join electric_vehicle_new e2
```

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

	VIN_1	range_1	VIN_2	range_2
▶	5YJYGDEE0L	291	WBY8P6C58K	153
	5YJSA1DP2D	208	WBY8P6C58K	153
	5YJXCAE27J	238	WBY8P6C58K	153
	1G1FZ6S07L	259	WBY8P6C58K	153
	5YJSA1H23F	208	WBY8P6C58K	153
	5YJXCBE27H	200	WBY8P6C58K	153
	5YJSA1H13F	208	WBY8P6C58K	153
	5YJXCDE28J	238	WBY8P6C58K	153
	5YJSA1E27L	330	WBY8P6C58K	153
	5YJSA1E2XH	210	WBY8P6C58K	153

Result 139 

Output



## Conclusion and Future Work

- Key Insights:
- Significant growth in electric vehicle registrations over recent years.
- Top models and manufacturers driving the market.
- Highest electric ranges achieved by leading models.



- Next Steps:
- Incorporate more detailed demographic data for deeper insights.
- Explore predictive analytics for future sales trends.
- Enhance data visualization for more interactive analysis



Thank You