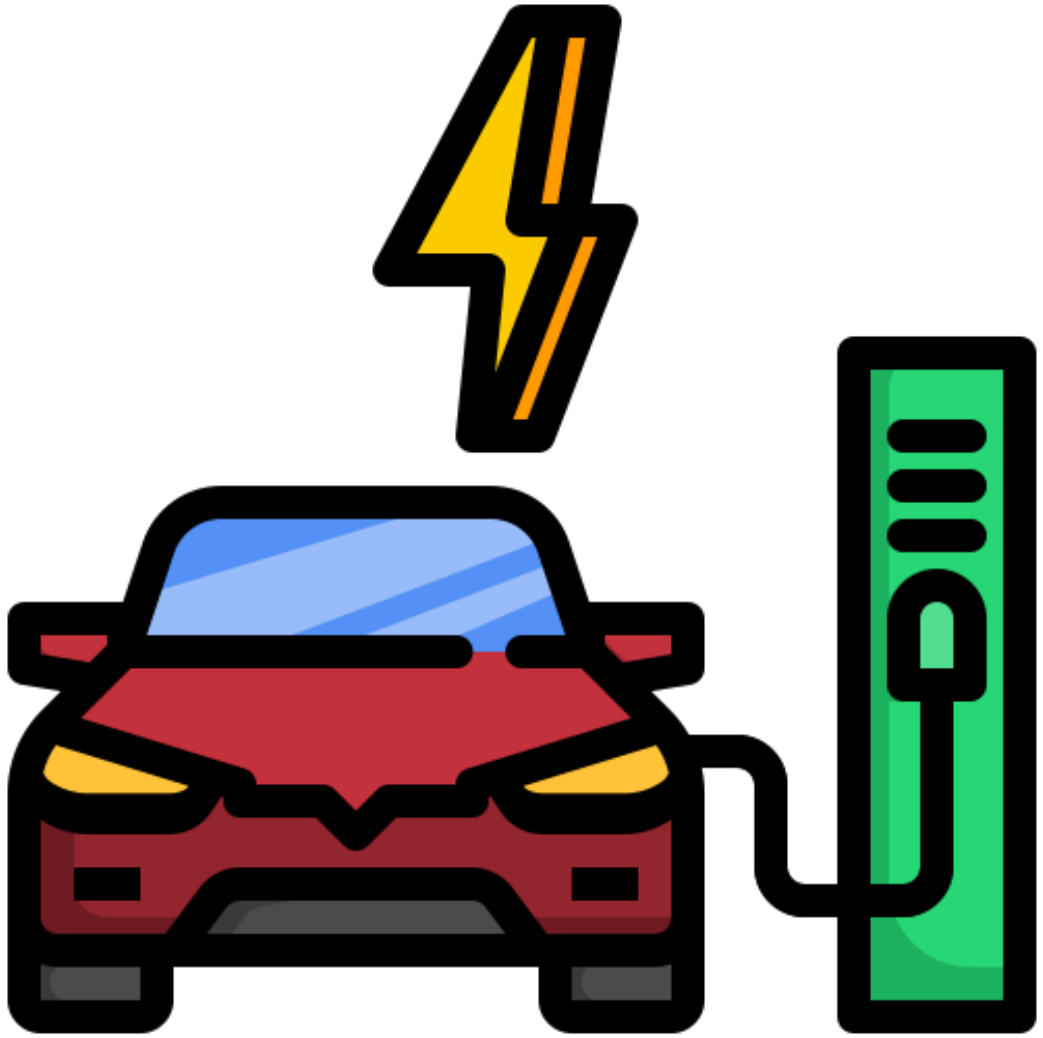


Electric Vehicle Data Analysis

SQL QUERIES AND INSIGHTS

BY UMA MAHESH

Introduction

Problem Statement:

- The rapid adoption of electric vehicles (EVs) has generated a wealth of data that needs to be effectively analyzed to gain insights into trends, performance, and market dynamics. Understanding this data is crucial for manufacturers, policymakers, and consumers.

Project Objective:

- To utilize SQL queries for comprehensive data analysis, uncovering patterns and insights in the electric vehicle market. This project aims to provide actionable information on vehicle specifications, market distribution, and trends in electric vehicle adoption.

Overview of the Electric Vehicle Dataset:

- A comprehensive dataset containing information on electric vehicles, including their identification, location, and specifications.

Purpose of the Analysis:

- To explore key metrics and insights related to electric vehicles using SQL queries.

Dataset Overview

VIN (1-10): Vehicle Identification Number
County: Registration county
City: Registration city
State: Registration state
Postal Code: Registration postal code
Model Year: Year of manufacture
Make: Vehicle manufacturer (e.g., Tesla, BMW)
Model: Vehicle model (e.g., Model S, I3)
Electric Vehicle Type: EV type (e.g., BEV, PHEV)
CAFV Eligibility: Alternative fuel vehicle incentive eligibility
Electric Range: Range on electric power (miles)
Base MSRP: Manufacturer's suggested retail price
Legislative District: Registration legislative district
DOL Vehicle ID: Licensing department vehicle ID
Vehicle Location: Geolocation coordinates
Electric Utility: Local utility provider
2020 Census Tract: Census tract code

Methodology

SQL Query Development:

Created SQL queries to extract relevant data points and metrics from the dataset.

Analysis and Interpretation:

Results from SQL queries were interpreted to uncover trends and insights.

Database Setup and Data Import

```sql
CREATE TABLE EV_Data (
    `VIN(1-10)` VARCHAR(10),
    `County` VARCHAR(255),
    `City` VARCHAR(255),
    `State` VARCHAR(2),
    `Postal Code` VARCHAR(10),
    `Model Year` INT,
    `Make` VARCHAR(255),
    `Model` VARCHAR(255),
    `Electric Vehicle Type` VARCHAR(255),
    `Clean Alternative Fuel Vehicle (CAFV) Eligibility` VARCHAR(255),
    `Electric Range` INT,
    `Base MSRP` DECIMAL(10, 2),
    `Legislative District` VARCHAR(255),
    `DOL Vehicle ID`INT,
    `Vehicle Location` VARCHAR(255),
    `Electric Utility` VARCHAR(255),
    `2020 Census Tract` VARCHAR(255)
);
```

```sql
LOAD DATA INFILE
'C:/ProgramData/MySQL/MySQL Server 8.0/Uploads/Mahesh Uma - Electric_Vehicle_Population_Data.csv'
INTO TABLE EV_Data
FIELDS TERMINATED BY ','
ENCLOSED BY '"'
LINES TERMINATED BY '\n'
IGNORE 1 LINES
(
    `VIN(1-10)`,
    `County`,
    `City`,
    `State`,
    `Postal Code`,
    `Model Year`,
    `Make`,
    `Model`,
    `Electric Vehicle Type`,
    `Clean Alternative Fuel Vehicle (CAFV) Eligibility`,
    `Electric Range`,
    `Base MSRP`,
    `Legislative District`,
    `DOL Vehicle ID`,
    `Vehicle Location`,
    `Electric Utility`,
    `2020 Census Tract`
);
```

```
51    #1. Write a query to list all electric vehicles with their VIN (1-10),Make,and Model
52 •  select `VIN(1-10)`,Make,Model from ev_data;
53
```

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

VIN(1-10)	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

Query 1 - List of Electric Vehicles

CONTENT: SQL QUERY TO DISPLAY VIN, MAKE, AND MODEL FOR ALL ELECTRIC VEHICLES.

INSIGHT: PROVIDES A BASIC OVERVIEW OF THE VEHICLES IN THE DATASET.

```sql
#2.Write a query to display all columns for electric vehicles with a Model Year of 2020 or later.
-- UMA MAHESH
select * from ev_data
where `model year` >= 2020;
```

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

VIN(1-10)	County	City	State	Postal Code	Model Year	Make	Model	Electric Vehicle Type	Clean Alternative Fuel Vehicle (CAFV) Eligibility
WBY33AW0XP	King	Seattle	WA	98109	2023	BMW	I4	Battery Electric Vehicle (BEV)	Eligibility unknown as battery range ha
5YJ3E1EB5L	King	Bothell	WA	98011	2020	TESLA	MODEL 3	Battery Electric Vehicle (BEV)	Clean Alternative Fuel Vehicle Eligible
1V2GNPE86P	King	Sammamish	WA	98075	2023	VOLKSWAGEN	ID.4	Battery Electric Vehicle (BEV)	Eligibility unknown as battery range ha
5YJ3E1EB0M	Yakima	Yakima	WA	98908	2021	TESLA	MODEL 3	Battery Electric Vehicle (BEV)	Eligibility unknown as battery range ha
SADHD2S10L	King	Bellevue	WA	98004	2020	JAGUAR	I-PACE	Battery Electric Vehicle (BEV)	Clean Alternative Fuel Vehicle Eligible
5YJYGAEE8M	Snohomish	Snohomish	WA	98296	2021	TESLA	MODEL Y	Battery Electric Vehicle (BEV)	Eligibility unknown as battery range ha
5YJ3E1EB6L	King	Redmond	WA	98052	2020	TESLA	MODEL 3	Battery Electric Vehicle (BEV)	Clean Alternative Fuel Vehicle Eligible

Query 2 - Electric Vehicles from 2020 Onwards

CONTENT: SQL QUERY TO FILTER ELECTRIC VEHICLES BY MODEL YEAR.

INSIGHT: FOCUSES ON THE LATEST MODELS IN THE DATASET.

```
59    #3. Write a query to list electric vehicles manufactured by Tesla. -- UMA MAHESH
60 •  select * from ev_data
61    where make = 'Tesla';
```

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

VIN(1-10)	County	City	State	Postal Code	Model Year	Make	Model	Electric Vehicle Type	Clean Alternative Fuel Vehicle (CAFV) Eligibility	Electric Range
5YJSA1DN4D	Kitsap	Bremerton	WA	98312	2013	TESLA	MODEL S	Battery Electric Vehicle (BEV)	Clean Alternative Fuel Vehicle Eligible	208
5YJSA1E26J	King	Kent	WA	98042	2018	TESLA	MODEL S	Battery Electric Vehicle (BEV)	Clean Alternative Fuel Vehicle Eligible	249
5YJXCDE23J	King	Bellevue	WA	98004	2018	TESLA	MODEL X	Battery Electric Vehicle (BEV)	Clean Alternative Fuel Vehicle Eligible	238
5YJ3E1EB5L	King	Bothell	WA	98011	2020	TESLA	MODEL 3	Battery Electric Vehicle (BEV)	Clean Alternative Fuel Vehicle Eligible	322
5YJ3E1EB0M	Yakima	Yakima	WA	98908	2021	TESLA	MODEL 3	Battery Electric Vehicle (BEV)	Eligibility unknown as battery range has n...	0
5YJSA1E29J	Kitsap	Poulsbo	WA	98370	2018	TESLA	MODEL S	Battery Electric Vehicle (BEV)	Clean Alternative Fuel Vehicle Eligible	249
5YJ3E1EBXJ	Thurston	Rainier	WA	98576	2018	TESLA	MODEL 3	Battery Electric Vehicle (BEV)	Clean Alternative Fuel Vehicle Eligible	215

Query 3 - Tesla Vehicles

CONTENT: SQL QUERY TO LIST VEHICLES MANUFACTURED BY TESLA.

INSIGHT: HIGHLIGHTS THE POPULARITY AND PRESENCE OF TESLA IN THE DATASET.

```sql
64  #4. Write a query to find all electric vehicles where the Model contains the word Leaf.
65  select * from ev_data
66  where model like '%leaf%';
67
```

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

VIN(1-10)	County	City	State	Postal Code	Model Year	Make	Model	Electric Vehicle Type	Clean Alternative Fuel Vehicle (CAFV) Eligibility	Electric Range
1N4BZ1CP3K	Kitsap	Bainbridge Island	WA	98110	2019	NISSAN	LEAF	Battery Electric Vehicle (BEV)	Clean Alternative Fuel Vehicle Eligible	150
1N4AZ0CP4E	King	Redmond	WA	98052	2014	NISSAN	LEAF	Battery Electric Vehicle (BEV)	Clean Alternative Fuel Vehicle Eligible	84
1N4AZ0CP2D	King	Bellevue	WA	98004	2013	NISSAN	LEAF	Battery Electric Vehicle (BEV)	Clean Alternative Fuel Vehicle Eligible	75
1N4AZ0CP6G	King	Seattle	WA	98125	2016	NISSAN	LEAF	Battery Electric Vehicle (BEV)	Clean Alternative Fuel Vehicle Eligible	84
JN1AZ0CP7B	Kitsap	Kingston	WA	98346	2011	NISSAN	LEAF	Battery Electric Vehicle (BEV)	Clean Alternative Fuel Vehicle Eligible	73
1N4BZ0CP9G	Kitsap	Port Orchard	WA	98366	2016	NISSAN	LEAF	Battery Electric Vehicle (BEV)	Clean Alternative Fuel Vehicle Eligible	84
1N4AZ0CP1G	King	Kirkland	WA	98034	2016	NISSAN	LEAF	Battery Electric Vehicle (BEV)	Clean Alternative Fuel Vehicle Eligible	84

Query 4 - Vehicles with 'Leaf' in the Model Name

CONTENT: SQL QUERY TO FIND VEHICLES WITH 'LEAF' IN THE MODEL.

INSIGHT: IDENTIFIES VEHICLES OF A SPECIFIC MODEL TYPE.

```sql
68    -- UMA MAHESH --
69    #5. Write a query to count the total number of electric vehicles in the dataset.
70 •  select count(distinct(`vin(1-10)`)) as total_number_electric_vehicles
71    from ev_data;
72
```

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

total_number_electric_vehicles
11242

Query 5 - Count of All Electric Vehicles

CONTENT: SQL QUERY TO COUNT THE TOTAL NUMBER OF VEHICLES.

INSIGHT: PROVIDES AN OVERALL COUNT OF THE ELECTRIC VEHICLES IN THE DATASET.

```sql
73    -- UMA MAHESH --
74    #6. Write a query to find the average Electric Range of all electric vehicles.
75 •  select avg(`Electric Range`) as Average_Electric_Range
76    from ev_data;
77
```

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

Average_Electric_Range
56.7078

Query 6 - Average Electric Range

CONTENT: SQL QUERY TO CALCULATE THE AVERAGE RANGE.

INSIGHT: SHOWS THE AVERAGE RANGE CAPABILITIES OF ELECTRIC VEHICLES.

```sql
78    -- UMA MAHESH --
79    #7. Write a query to list the top 5 electric vehicles with the highest Base MSRP,
80    -- sorted in descending order.
81 •  select * from ev_data
82    order by `Base MSRP` desc
83    limit 5;
```

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

VIN(1-10)	County	City	State	Postal Code	Model Year	Make	Model	Electric Vehicle Type	Clean Alternative Fuel Vehicle (CAFV Eligibility
WP0CA2A13F	King	Hunts Point	WA	98004	2015	PORSCHE	918	Plug-in Hybrid Electric Vehicle (PHEV)	Not eligible due to low battery range
WP0AH2A73J	Clark	Vancouver	WA	98662	2018	PORSCHE	PANAMERA	Plug-in Hybrid Electric Vehicle (PHEV)	Not eligible due to low battery range
WP0AH2A7XJ	King	Kent	WA	98042	2018	PORSCHE	PANAMERA	Plug-in Hybrid Electric Vehicle (PHEV)	Not eligible due to low battery range
WP0AH2A71J	Clark	Brush Prairie	WA	98606	2018	PORSCHE	PANAMERA	Plug-in Hybrid Electric Vehicle (PHEV)	Not eligible due to low battery range
WP0AH2A70J	King	Bellevue	WA	98006	2018	PORSCHE	PANAMERA	Plug-in Hybrid Electric Vehicle (PHEV)	Not eligible due to low battery range

Query 7 - Top 5 Vehicles by Base MSRP

CONTENT: SQL QUERY TO LIST THE TOP 5 VEHICLES WITH THE HIGHEST MSRP.

INSIGHT: HIGHLIGHTS HIGH-END ELECTRIC VEHICLES IN TERMS OF PRICE.

```sql
-- UMA MAHESH --
#8. 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.
select ev1.`VIN(1-10)` as VIN_1, ev2.`VIN(1-10)` as VIN_2, ev1.Make, ev1.`Model Year`
from ev_data ev1
join ev_data ev2
on ev1.Make = ev2.Make
and ev1.`Model Year` = ev2.`Model Year`
and ev1.`VIN(1-10)` <>  ev2.`VIN(1-10)`;

```

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

Query 8 - Vehicles with Same Make and Model Year

CONTENT: SQL QUERY TO FIND PAIRS OF VEHICLES WITH THE SAME MAKE AND MODEL YEAR.

INSIGHT: SHOWS HOW MANUFACTURERS PRODUCE MULTIPLE MODELS IN THE SAME YEAR.

```sql
-- UMA MAHESH --
#9. Write a query to find the total number of electric vehicles for each Make.
-- Display Make and the count of vehicles.
select make,count(*) as vehical_count from ev_data
group by make
order by vehical_count;
```

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

make	vehical_count
ROLLS ROYCE	2
WHEEGO ELECTRIC CARS	3
BENTLEY	3
GMC	4
THINK	5
AZURE DYNAMICS	8
ALFA ROMEO	47
LAND ROVER	57
FISKER	166

Query 9 - Count of Vehicles per Make

CONTENT: SQL QUERY TO COUNT VEHICLES GROUPED BY MAKE.

INSIGHT: DISTRIBUTION OF ELECTRIC VEHICLES ACROSS DIFFERENT MANUFACTURERS.

```sql
-- UMA MAHESH --
#10. 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.
select `VIN(1-10)`, make,`Electric Range`,
case
    when `Electric Range`<100 then 'Short Range'
    when `Electric Range`between 100 and 200 then 'Medium Range'
    else 'Long Range'
    end as Type_
from ev_data;
```

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

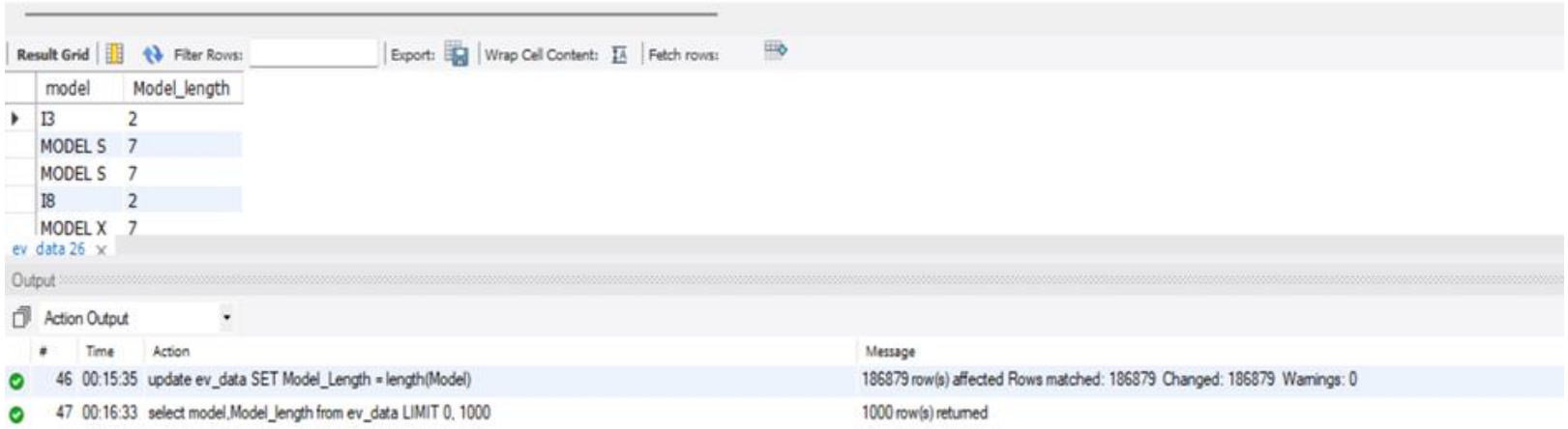
VIN(1-10)	make	Electric Range	Type_
WBY8P6C58K	BMW	153	Medium Range
5YJSA1DN4D	TESLA	208	Long Range
5YJSA1E26J	TESLA	249	Long Range
WBY2Z2C54E	BMW	14	Short Range
5YJXCDE23J	TESLA	238	Long Range
WBY33AW0XP	BMW	0	Short Range
5YJ3E1EB5L	TESLA	322	Long Range
1V2GNPE86P	VOLKSWAGEN	0	Short Range

Query 10 - Categorizing Vehicles by Electric Range

CONTENT: SQL QUERY USING A CASE STATEMENT TO CATEGORIZE VEHICLES.

INSIGHT: CATEGORIZES VEHICLES BASED ON THEIR RANGE.

```sql
-- UMA MAHESH --
#11. Write a query to add a new column Model_Length to the electric vehicles table
-- that calculates the length of each Model name.
alter table ev_data add column Model_Length INT;
update ev_data SET Model_Length = length(Model);
select model,Model_length from ev_data;
```



Query 11 - Adding a Column for Model Length

Content: SQL query to add a column calculating the length of each Model name.

Insight: Adds additional data insights into vehicle models.

```sql
121    -- UMA MAHESH --
122    #12. Write a query using an advanced function to find the electric vehicle
123    -- with the highest Electric Range.
124 •  select model,`Electric Range`from
125    (select model,`Electric Range`,row_number() over(order by `Electric Range` desc)as rn
126    from ev_data) v
127    where rn=1;
```

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

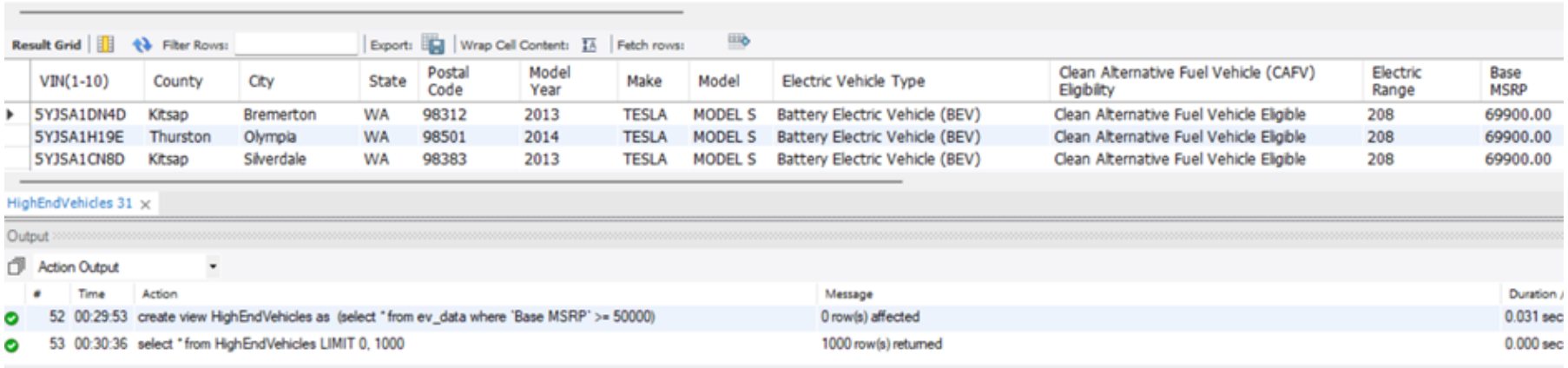
model	Electric Range
MODEL S	337

Query 12 - Vehicle with the Highest Electric Range

Content: SQL query to determine the vehicle with the maximum range.

Insight: Identifies the electric vehicle with the best range.

```sql
-- UMA MAHESH --
#13. Create a view named HighEndVehicles that includes electric vehicles with
-- a Base MSRP of $50,000 or higher.
create view HighEndVehicles as
(select * from ev_data
where `Base MSRP` >= 50000);
select * from HighEndVehicles;
```



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

VIN(1-10)	County	City	State	Postal Code	Model Year	Make	Model	Electric Vehicle Type	Clean Alternative Fuel Vehicle (CAFV) Eligibility	Electric Range	Base MSRP
5YJSA1DN4D	Kitsap	Bremerton	WA	98312	2013	TESLA	MODEL S	Battery Electric Vehicle (BEV)	Clean Alternative Fuel Vehicle Eligible	208	69900.00
5YJSA1H19E	Thurston	Olympia	WA	98501	2014	TESLA	MODEL S	Battery Electric Vehicle (BEV)	Clean Alternative Fuel Vehicle Eligible	208	69900.00
5YJSA1CN8D	Kitsap	Silverdale	WA	98383	2013	TESLA	MODEL S	Battery Electric Vehicle (BEV)	Clean Alternative Fuel Vehicle Eligible	208	69900.00

HighEndVehicles 31 ×

Output

Action Output

#	Time	Action	Message	Duration
52	00:29:53	create view HighEndVehicles as (select * from ev_data where `Base MSRP` >= 50000)	0 row(s) affected	0.031 sec
53	00:30:36	select * from HighEndVehicles LIMIT 0, 1000	1000 row(s) returned	0.000 sec

Query 13 - View for High-End Vehicles

Content: SQL query to create a view for vehicles with Base MSRP over $50,000.

Insight: Provides a focused view of luxury electric vehicles.

```
138    -- UMA MAHESH --
139    #14. Write a query using a window function to rank electric vehicles
140    -- based on their Base MSRP within each Model Year.
141 •  select distinct `VIN(1-10)`, make, model, `model year`,`Base MSRP`,
142    rank() over (partition by`Model Year`order by`Base MSRP`desc) as ranking
143    from ev_data;
```

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

VIN(1-10)	make	model	model year	Base MSRP	ranking
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
1FTZR0813Y	FORD	RANGER	2000	0.00	1
1FTZR0819Y	FORD	RANGER	2000	0.00	1
1FTZR0816Y	FORD	RANGER	2000	0.00	1

Query 14 - Ranking Vehicles by Base MSRP

Content: SQL query using a window function to rank vehicles.

Insight: Ranks vehicles within each year to show price differences.

```sql
-- UMA MAHESH --
#15. Write a query to calculate the cumulative count of electric vehicles
-- registered each year sorted by Model Year.
select `Model Year`,count(*) as yearly_count,
sum(count(*)) over (order by`Model Year`) as cummulative_count
from ev_data
group by `Model Year`;
```

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

Model Year	yearly_count	cummulative_count
1997	1	1
1998	1	2
1999	5	7
2000	7	14
2002	2	16
2003	1	17
2008	20	37

Query 15 - Cumulative Count of Vehicles by Year

Content: SQL query to calculate the cumulative count of vehicles by year.

Insight: Shows growth in electric vehicle registrations over time.

```
153   -- UMA MAHESH --
154   #16. Write a stored procedure to update the Base MSRP of a vehicle given its VIN (1-10) and new Base MSRP.
155   delimiter //
156 • create procedure Update_msrp(in a
157   text, in b int)
158   begin
159   update ev_data set `Base MSRP` = b
160   where `VIN(1-10)` = a;
161   end //
162   DELIMITER ;
163 • set SQL_SAFE_UPDATES = 0;
164 • call Update_msrp('WBY8P6C58K', 5000);
165 • select `VIN(1-10)`,`Base MSRP`from ev data;
```

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

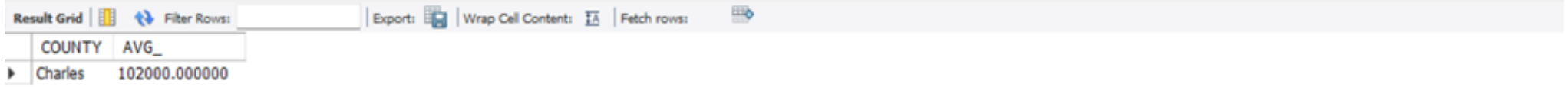
VIN(1-10)	Base MSRP
WBY8P6C58K	5000.00

Query 16 - Stored Procedure for Updating MSRP

Content: SQL stored procedure to update vehicle MSRP based on VIN.

Insight: Provides a dynamic method to update vehicle data.

```sql
-- UMA MAHESH --
#17. Write a query to find the county with the highest average Base MSRP for electric vehicles.
-- Use subqueries and aggregate functions to achieve this.
select COUNTY, AVG_
from (select County, avg(`Base MSRP`) as AVG_
 from ev_data
 group by County
) as t
order by AVG_ desc
limit 1;
```



COUNTY	AVG_
Charles	102000.000000

Query 17 - County with Highest Average MSRP

Content: SQL query using subqueries and aggregates to find the top county.

Insight: Identifies regions with higher-end electric vehicles.

```sql
-- UMA MAHESH --
#18. 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.
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
from ev_data ev1
join ev_data ev2
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
Seattle	5YJSA1H23F	208	WBY8P6C58K	153
Seattle	5YJXCBE27H	200	WBY8P6C58K	153
Seattle	5YJSA1H13F	208	WBY8P6C58K	153

Query 18 - Comparing Vehicle Ranges within the Same City

Content: SQL query to find pairs of vehicles in the same city with different ranges.

Insight: Compares electric vehicle ranges within the same geographic location.

SUMMARY OF KEY FINDINGS

- **High Adoption in Urban Areas:**
  - Major cities show the highest adoption rates for electric vehicles, likely due to better charging infrastructure and greater environmental awareness.
- **Popular Electric Vehicle Models and Makes:**
  - Tesla dominates the market with the highest number of registrations, followed by Nissan and Chevrolet, indicating strong consumer preference for these brands.
  - Models such as Tesla Model 3 and Nissan Leaf are the most popular due to their range and affordability.
- **Electric Range Insights:**
  - The majority of electric vehicles have a range between 100-300 miles, with longer-range vehicles being more prevalent in recent model years, showing advancements in battery technology.
- **Price Distribution and Market Trends:**
  - The base MSRP of electric vehicles varies significantly, with luxury brands commanding higher prices while there is a growing presence of more affordable models.
  - Price trends indicate increasing affordability, which may drive future growth in EV adoption.
- **CAFV Eligibility Impact:**
  - Vehicles eligible for Clean Alternative Fuel Vehicle (CAFV) incentives are more prevalent in states with aggressive environmental policies, demonstrating the impact of government incentives on EV adoption.
- **Utility and Legislative District Insights:**
  - Electric vehicle adoption is concentrated in specific legislative districts, often aligning with areas served by electric utilities that provide incentives or have more developed EV charging infrastructure.

Conclusion

The analysis provides a comprehensive understanding of the electric vehicle market dynamics, highlighting the importance of infrastructure, incentives, and consumer preferences in driving EV adoption.

These insights can help stakeholders make informed decisions to promote further growth and adoption of electric vehicles.

THANK YOU