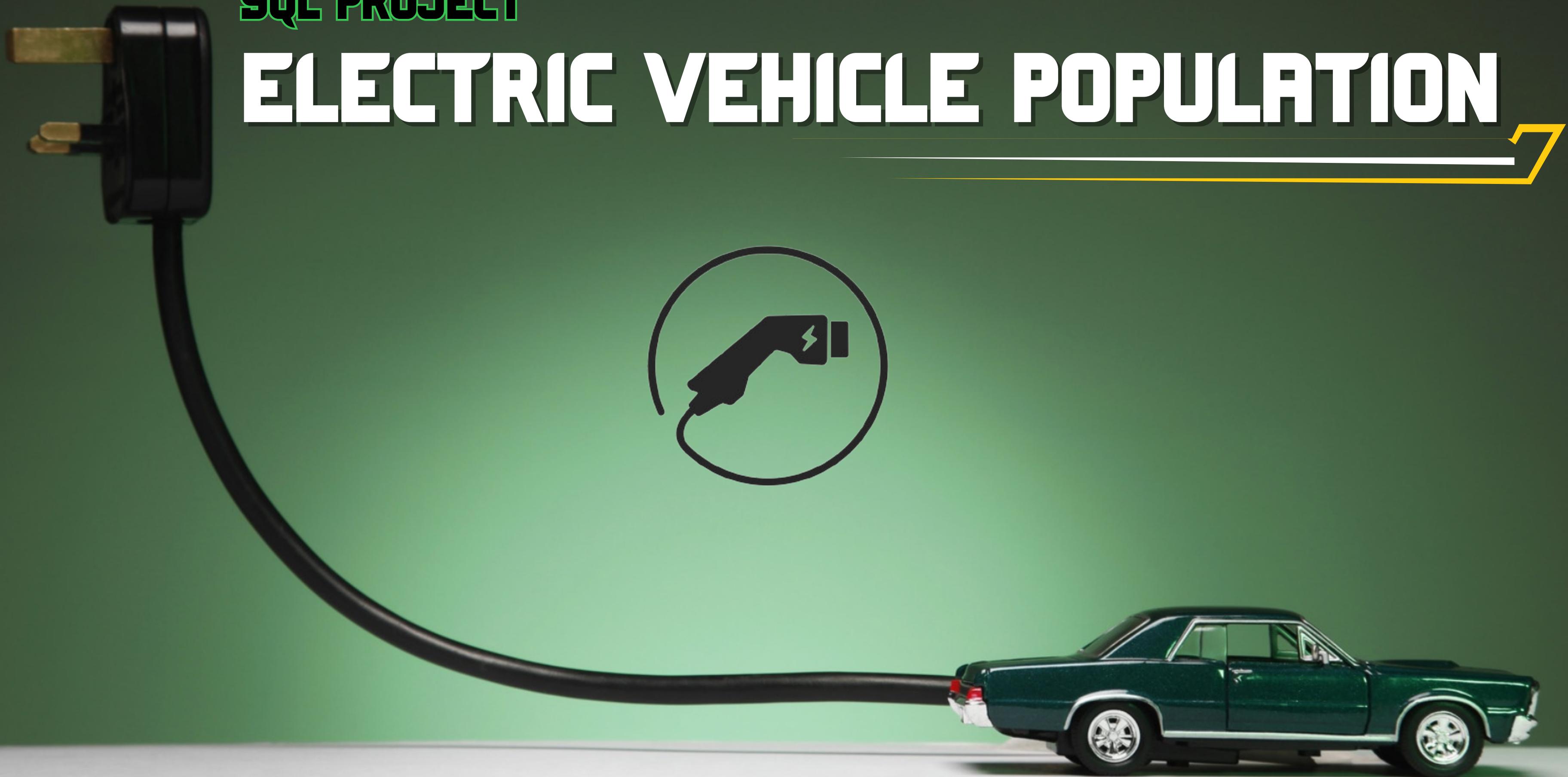
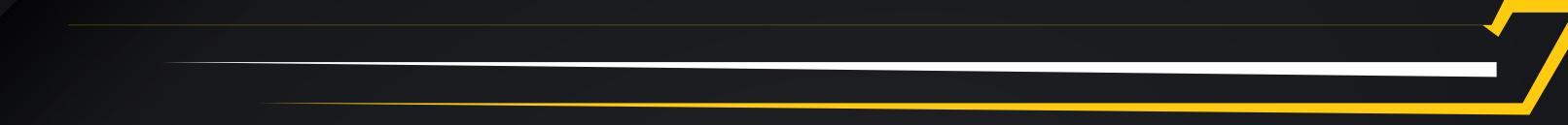


SQL PROJECT

ELECTRIC VEHICLE POPULATION



PROJECT OVERVIEW



In this project, we're diving into a fascinating dataset on electric vehicles using SQL. Our aim is to understand the yearly trends and figure out which electric cars are the most popular. We'll explore details like the driving range per charge and where these cars are most commonly found. This project is all about uncovering insights in the world of electric vehicles. So, let's get started and explore the trends and favorites in the electric car scene using some clever SQL techniques!

DIVISION

EASY

MODERATE

HARD



ELECTRIC
VEHICLE CHARGING



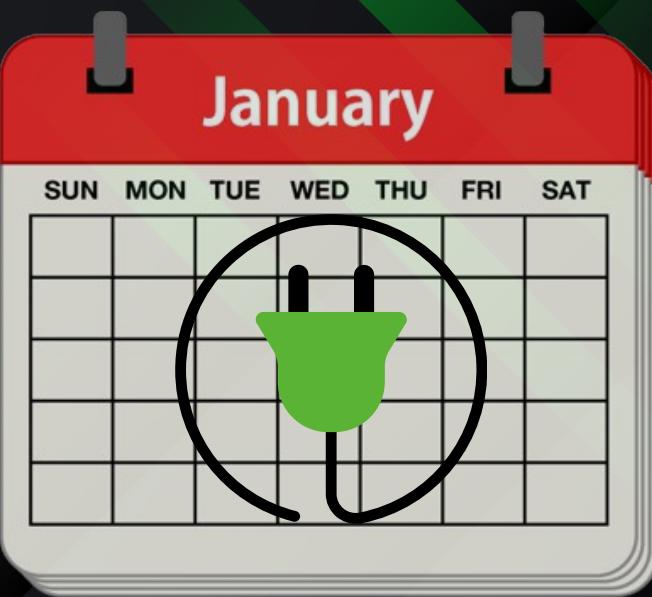
EASY

Q1. Write a query to analyze the trend in the count of electric vehicles over the years, showing the count for each year.

```
SELECT Model_Year, COUNT(*) AS VehicleCount  
FROM ElectricVehicles  
GROUP BY Model_Year  
ORDER BY Model_Year;
```

model_year	vehiclecount
1997	1
1998	1
1999	4
2000	8
2002	2
2003	1
2008	19
2010	24
2011	796
2012	1633

2013	4566	
2014	3613	
2015	4934	
2016	5650	
2017	8574	
2018	14441	
2019	10717	
2020	11294	
2021	18684	
2022	27799	
2023	37079	
2024	610	

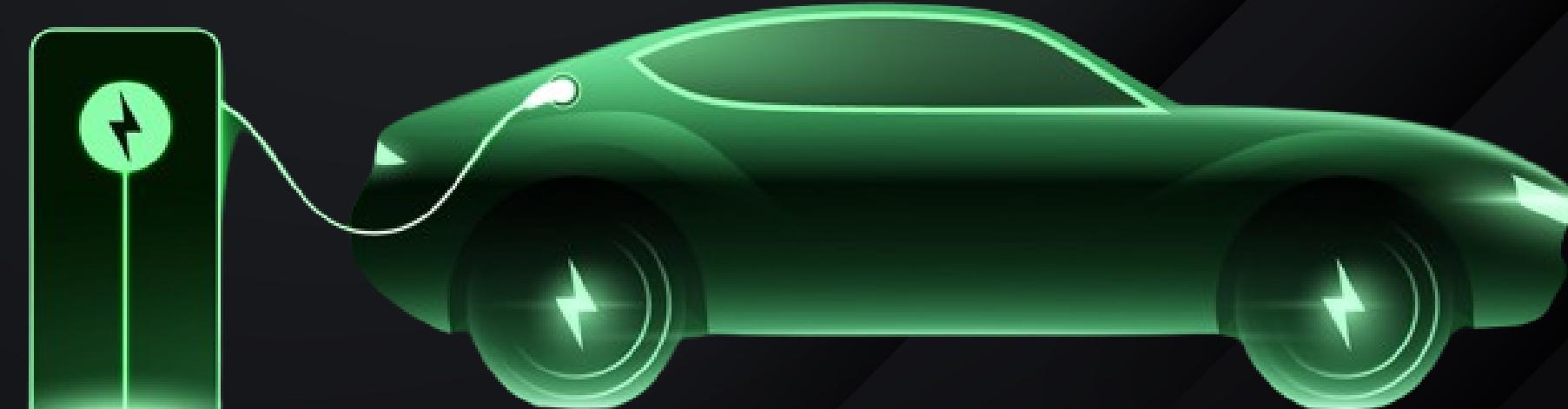


EASY

Q2. Identify the top 3 electric vehicle models with the highest base Manufacturer's Suggested Retail Price (MSRP).

```
SELECT Make, Model, Base_MSRP  
FROM ElectricVehicles  
ORDER BY Base_MSRP DESC  
LIMIT 3;
```

	make character varying (255) 	model character varying (200) 	base_msrp numeric (15,2) 
1	PORSCHE	918	845000.00
2	PORSCHE	PANAMERA	184400.00
3	PORSCHE	PANAMERA	184400.00



EASY

Q3. Identify the top 5 counties with the highest number of registered electric vehicles.



```
SELECT County, COUNT(*) AS VehicleCount  
FROM ElectricVehicles  
GROUP BY County  
ORDER BY VehicleCount DESC  
LIMIT 5;
```

	county character varying (255)	vehiclecount bigint
1	King	79075
2	Snohomish	17307
3	Pierce	11542
4	Clark	8855
5	Thurston	5403

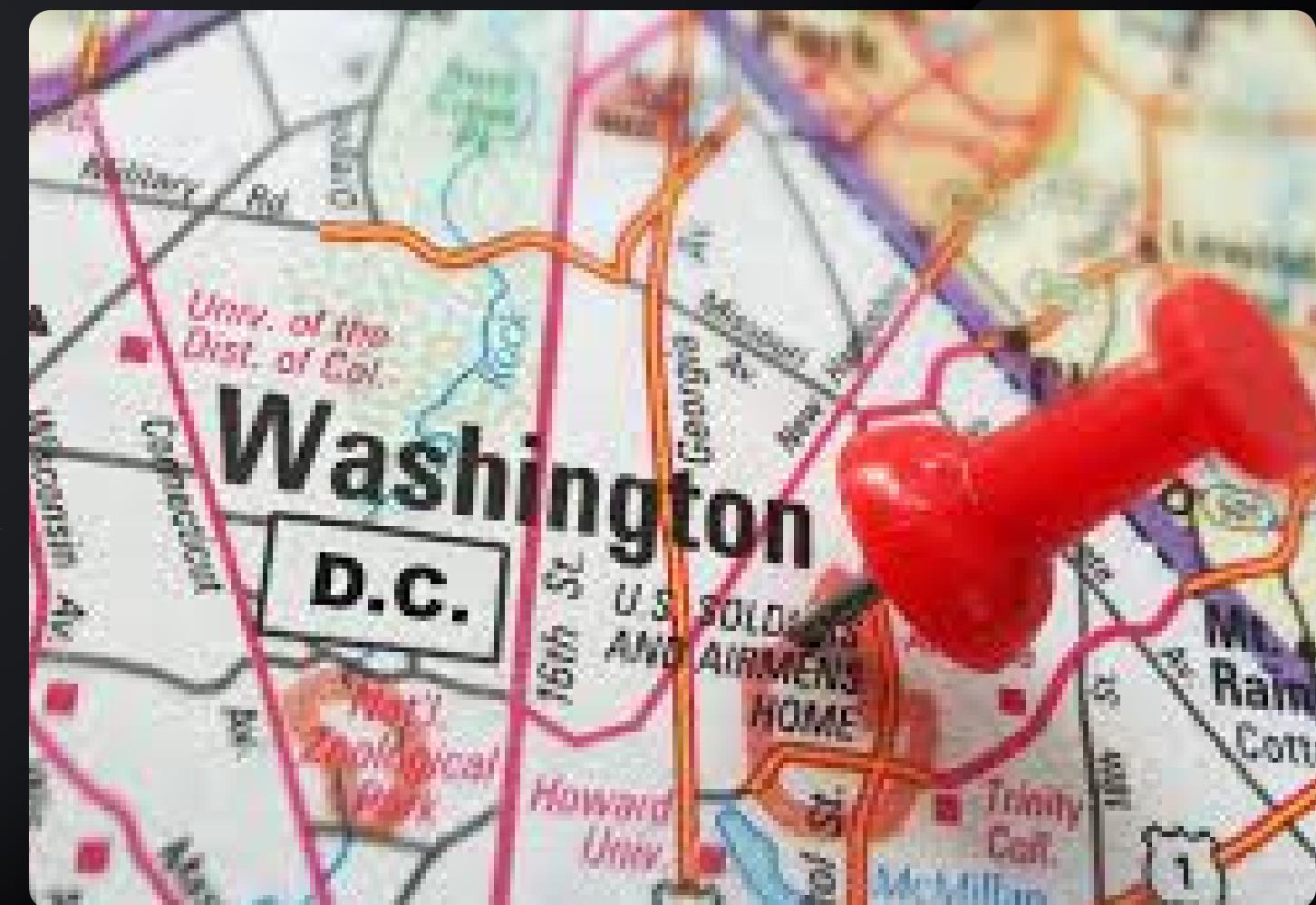
EASY

Q4. Determine the total count of electric vehicles registered in Washington state.

```
SELECT COUNT(*) AS VehicleCount  
FROM ElectricVehicles  
WHERE State = 'WA';
```



	vehiclecount	bigint
1	150141	



MODERATE

Q5. Calculate the deviation of each electric vehicle's range from the average electric range of its corresponding model year.

```
SELECT VIN, Model_Year, Electric_Range,  
       Electric_Range - AVG(Electric_Range) OVER (PARTITION BY Model_Year) AS RangeDeviation  
FROM ElectricVehicles;
```

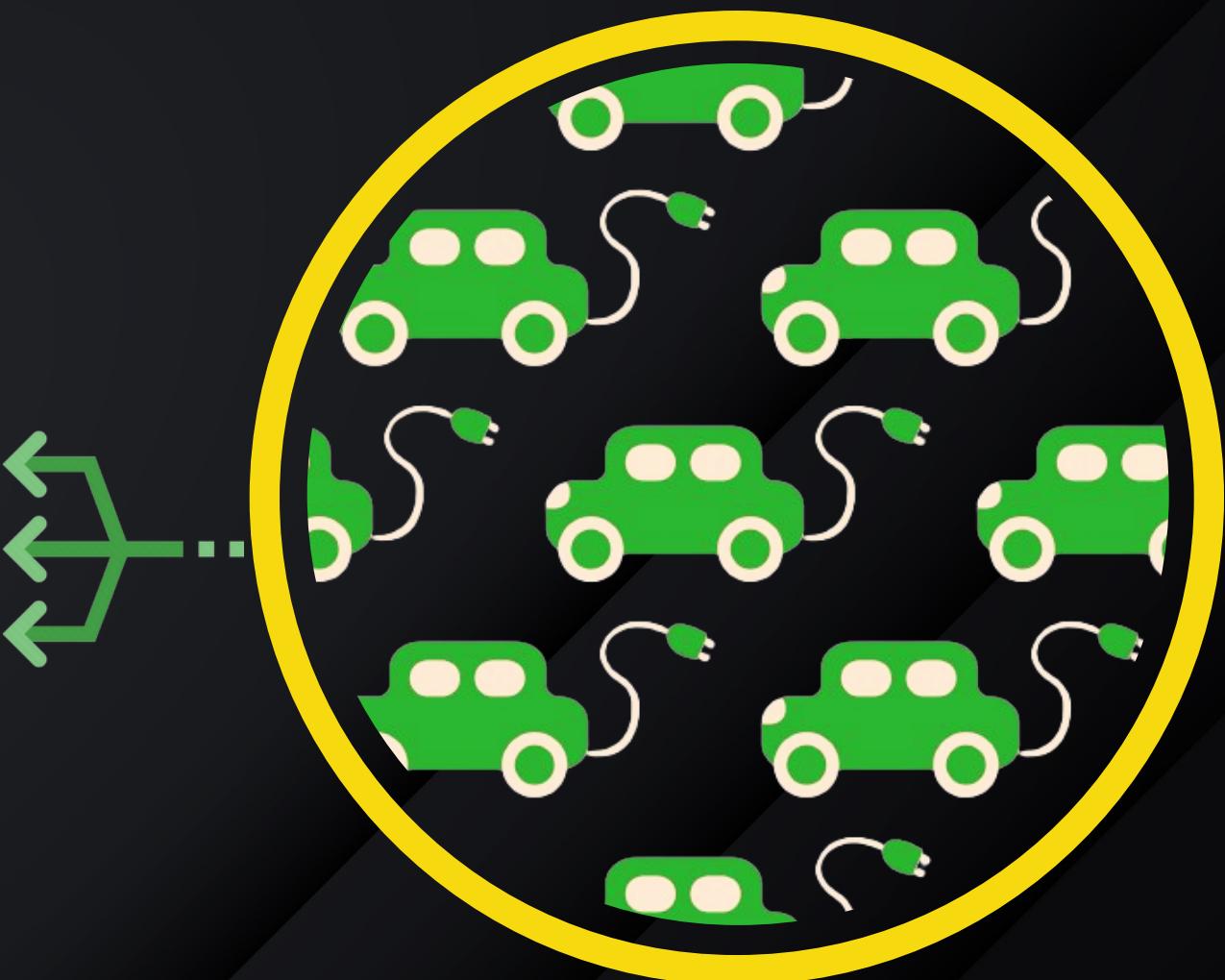


	vin character varying (10)	model_year integer	electric_range integer	rangeDeviation numeric
1	1GCDE14HXV	1997	39	0.0000000000000000
2	1FTZR1078W	1998	58	0.0000000000000000
3	1FTZR0813X	1999	74	0.0000000000000000
4	1FTZR0812X	1999	74	0.0000000000000000
5	1FTZR0812X	1999	74	0.0000000000000000
6	1FTZR0819X	1999	74	0.0000000000000000
7	1FTZR0870Y	2000	58	0.0000000000000000
8	1FTZR081XY	2000	58	0.0000000000000000
9	1FTZR0879Y	2000	58	0.0000000000000000
10	1FTZR0813Y	2000	58	0.0000000000000000
11	1FTZR0816Y	2000	58	0.0000000000000000
12	1FTZR0819Y	2000	58	0.0000000000000000
13	1FTZR0816Y	2000	58	0.0000000000000000
14	1FTZR0817Y	2000	58	0.0000000000000000
15	JT3GS10V32	2002	95	0.0000000000000000
16	JT3GS10V02	2002	95	0.0000000000000000
17	JT3GS10VX3	2003	95	0.0000000000000000
18	5YJRE11B38	2008	220	0.0000000000000000
19	5YJRE11B78	2008	220	0.0000000000000000
20	5YJRE11B68	2008	220	0.0000000000000000
21	5YJRE11B88	2008	220	0.0000000000000000
22	5Y.IRF11R08	2008	220	0.0000000000000000

MODERATE

Q6. Provide a breakdown of the distribution of electric vehicle types (e.g., BEV, PHEV) for each county. Additionally, identify the county with the highest count of each electric vehicle type.

```
WITH EVTypeDistribution AS (
    SELECT
        County,
        Electric_Vehicle_Type,
        COUNT(*) AS EVTypeCount,
        RANK() OVER (PARTITION BY Electric_Vehicle_Type ORDER BY COUNT(*) DESC) AS RankByTypeCount
    FROM ElectricVehicles
    GROUP BY County, Electric_Vehicle_Type
)
SELECT
    County,
    Electric_Vehicle_Type,
    EVTypeCount
FROM EVTypeDistribution
WHERE RankByTypeCount = 1; -- Select the highest count for each electric vehicle type
```



	county character varying (255)	electric_vehicle_type character varying (200)	evtypecount bigint
1	King	Battery Electric Vehicle (BEV)	63625
2	King	Plug-in Hybrid Electric Vehicle (PHEV)	15450

MODERATE

Q7. Compare the percentage of Clean Alternative Fuel Vehicle (CAFV) eligible electric vehicles among different makes. Identify the top 5 makes with the highest CAFV eligibility rates.



```
WITH MakeCAFVRate AS (
    SELECT
        Make,
        COUNT(*) AS TotalEVs,
        SUM(CASE WHEN CAFV_Eligibility = 'Clean Alternative Fuel Vehicle' THEN 1 ELSE 0 END) AS CAFVCount,
        (SUM(CASE WHEN CAFV_Eligibility = 'Clean Alternative Fuel Vehicle' THEN 1 ELSE 0 END) * 100 / COUNT(*)) AS CAFVRate
    FROM ElectricVehicles
    GROUP BY Make
)
SELECT
    Make,
    TotalEVs,
    CAFVCount,
    CAFVRate
FROM MakeCAFVRate
ORDER BY CAFVRate DESC
LIMIT 5;
```



HARD

Q8. Find legislative districts where there is a diverse range of electric vehicle types, considering both Battery Electric Vehicles (BEV) and Plug-in Hybrid Electric Vehicles (PHEV).

```
SELECT Make,Legislative_District, COUNT(DISTINCT Electric_Vehicle_Type) AS UniqueEVTypes  
FROM ElectricVehicles  
GROUP BY Legislative_District,Make  
HAVING COUNT(DISTINCT Electric_Vehicle_Type) > 1  
LIMIT 10;
```



	make character varying (255) 	legislative_district integer 	uniqueevtypes bigint 
1	AUDI	1	2
2	BMW	1	2
3	CADILLAC	1	2
4	CHEVROLET	1	2
5	FORD	1	2
6	HYUNDAI	1	2
7	KIA	1	2
8	LEXUS	1	2
9	MERCEDES-BENZ	1	2
10	MINI	1	2

HARD

Q9. Find VINs with irregularities in their structure, considering the first 10 characters. This could include duplicates or unexpected patterns.



```
SELECT VIN, COUNT(*) AS DuplicateCount  
FROM ElectricVehicles  
GROUP BY VIN  
HAVING COUNT(*) > 1;
```

	vin character varying (10)	duplicatecount bigint
1	WP0BA2Y13N	3
2	1N4AZ1CV8M	12
3	3FA6P0PU5J	10
4	7SAYGAE7P	176
5	WDC0G5EB9K	15
6	YV4H60DM8R	3
7	WA16ABGE8R	2
8	5YJYGDED5M	11
9	WBY7Z8C58J	2
10	2C4RC1N73J	27
11	5YJXCBE46L	5
12	KND3LD8K	7
13	KND3DLC3P	37
14	KNDM3LD7N	2
15	JN1AF0BA4P	7
16	5YJXCAE2XG	14
17	JTMEB3FV7P	7
18	WB523CF08P	16
19	2C4RC1L70H	2
20	WP0AB2Y17N	3
21	WA1VABGE8M	2
22	5YISA1F52M	19

HARD

Q10. Find electric vehicles in regions where the adoption of Clean Alternative Fuel Vehicles (CAFVs) is high, considering both the number of CAFVs and the total number of electric vehicles.

```
WITH CAFVRegion AS (
    SELECT County, COUNT(*) AS CAFVCount
    FROM ElectricVehicles
    WHERE CAFV_Eligibility = 'Clean Alternative Fuel Vehicle'
    GROUP BY County
)
SELECT ev.make, ev.County, COUNT(ev.VIN) AS TotalEVs, cr.CAFVCount
FROM ElectricVehicles ev
LEFT JOIN CAFVRegion cr ON ev.County = cr.County
GROUP BY ev.County, cr.CAFVCount, ev.make
ORDER BY cr.CAFVCount DESC;
```



	make character varying (255)	county character varying (255)	totalevs bigint	cafvcnt bigint
1	JEEP	Pierce	228	[null]
2	RIVIAN	Kittitas	10	[null]
3	HONDA	Cowlitz	6	[null]
4	CHRYSLER	Kittitas	6	[null]
5	SMART	Kitsap	24	[null]
6	FORD	Asotin	3	[null]
7	MINI	Grays Harbor	1	[null]
8	TESLA	Dorchester	1	[null]
9	MINI	Whatcom	13	[null]
10	MERCEDES-BENZ	Spokane	10	[null]
11	MITSUBISHI	Walla Walla	4	[null]
12	SUBARU	Pierce	21	[null]
13	BMW	Dallas	1	[null]
14	RIVIAN	Wahkiakum	1	[null]
15	VOLKSWAGEN	Grant	5	[null]
16	VOLVO	Kittitas	12	[null]
17	NISSAN	Hamilton	1	[null]
18	SUBARU	Snohomish	40	[null]
19	LINCOLN	Okanogan	1	[null]
20	RIVIAN	Klickitat	10	[null]
21	POLESTAR	Whitman	1	[null]
22	MITSUBISHI	Thurston	118	[null]

