

## PROJECT: ANALYZING ELECTRIC VEHICLE CHARGING HABITS

As electronic vehicles (EVs) become more popular, there is an increasing need for access to charging stations, also known as ports. To that end, many modern apartment buildings have begun retrofitting their parking garages to include shared charging stations. A charging station is shared if it is accessible by anyone in the building.



But with increasing demand comes competition for these ports — nothing is more frustrating than coming home to find no charging stations available! In this project, you will use a dataset to help apartment building managers better understand their tenants' EV charging habits.

The data has been loaded into a PostgreSQL database with a table named `charging_sessions` with the following columns:

### charging\_sessions

Column	Definition	Data type
<code>garage_id</code>	Identifier for the garage/building	VARCHAR
<code>user_id</code>	Identifier for the individual user	VARCHAR
<code>user_type</code>	Indicating whether the station is <code>Shared</code> or <code>Private</code>	VARCHAR
<code>start_plugin</code>	The date and time the session started	DATETIME
<code>start_plugin_hour</code>	The hour (in military time) that the session started	NUMERIC
<code>end_plugout</code>	The date and time the session ended	DATETIME
<code>end_plugout_hour</code>	The hour (in military time) that the session ended	NUMERIC
<code>duration_hours</code>	The length of the session, in hours	NUMERIC
<code>el_kwh</code>	Amount of electricity used (in Kilowatt hours)	NUMERIC
<code>month_plugin</code>	The month that the session started	VARCHAR
<code>weekdays_plugin</code>	The day of the week that the session started	VARCHAR

Let's get started!

### Sources

- Data: [CC BY 4.0](#), via [Kaggle](#),
- Image: Julian Herzog, [CC BY 4.0](#), via Wikimedia Commons

Projects Data DataFrame as unique\_users\_per\_garage

```
-- unique_users_per_garage
SELECT garage_id,
       COUNT(DISTINCT user_id) AS num_unique_users
FROM charging_sessions
WHERE user_type = 'Shared'
GROUP BY garage_id
ORDER BY num_unique_users DESC;
```

index	garage_id	num_unique_users
0	BI2	18
1	AsO2	17
2	UT9	16
3	AdO3	3
4	MS1	2
5	SR2	2
6	AdA1	1
7	Ris	1

Rows: 8

[Expand](#)

Projects Data DataFrame as most\_popular\_shared\_start\_times

```
-- most_popular_shared_start_times
SELECT weekdays_plugin,
       start_plugin_hour,
       COUNT(start_plugin_hour) AS num_charging_sessions
FROM charging_sessions
WHERE user_type = 'Shared'
GROUP BY weekdays_plugin,start_plugin_hour
ORDER BY num_charging_sessions DESC
LIMIT 10;
```

index	weekdays_plugin	start_plugin_hour	num_charging_sessions
0	Sunday	17	30
1	Friday	15	28
2	Thursday	19	26
3	Thursday	16	26
4	Wednesday	19	25
5	Sunday	18	25
6	Sunday	15	25
7	Monday	15	24
8	Friday	16	24
9	Tuesday	16	23

Rows: 10

[Expand](#)

Projects Data DataFrame as long\_duration\_shared\_users

```
-- long_duration_shared_users
SELECT user_id,
       AVG(duration_hours) AS avg_charging_duration
FROM charging_sessions
WHERE user_type = 'Shared'
GROUP BY user_id
HAVING AVG(duration_hours) > 10
ORDER BY avg_charging_duration DESC;
```

index	... ↑↓	user_id	... ↑↓	avg_charging_duration	... ↑↓
	0	Share-9			16.845833335
	1	Share-17			12.894555511
	2	Share-25			12.2144747466
	3	Share-18			12.0888071898
	4	Share-8			11.5504308392
	5	AdO3-1			10.3693869729

Rows: 6 -expand