

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

```
-- Number of unique individuals that use each garage's shared charging stations
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		Bl2			
	1		AsO2			
	2		UT9			
	3		AdO3			
	4		MS1			
	5		SR2			
	6		AdA1			
	7		Ris			

Rows: 8

Expand

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

```
-- Top 10 most popular charging start times for sessions that use shared charging stations

SELECT weekdays_plugin,
       start_plugin_hour,
       COUNT(*) 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	
	1		Friday					15	
	2		Thursday					19	
	3		Thursday					16	
	4		Wednesday					19	
	5		Sunday					18	
	6		Sunday					15	
	7		Monday					15	
	8		Friday					16	
	9		Tuesday					16	

Rows: 10

Expand

Projects Data DataFrame as long\_duration\_shared\_users

```
-- Users whose average charging duration last longer than 10 hours when using shred charging stations
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(duration_hours) DESC;
```

...	↑↓	...	↑↓	avg_charging_duri...	...	↑↓
0	Share-9			16.845833335		
1	Share-17			12.8945555511		
2	Share-25			12.2144747466		
3	Share-18			12.0888071898		
4	Share-8			11.5504308392		
5	AdO3-1			10.3693869729		

Rows: 6 ↗ Expand