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
`garage_id`	Identifier for the garage/building	`VARCHAR`
`user_id`	Identifier for the individual user	`VARCHAR`
`user_type`	Indicating whether the station is `Shared` or `Private`	`VARCHAR`
`start_plugin`	The date and time the session started	`DATETIME`
`start_plugin_hour`	The hour (in military time) that the session started	`NUMERIC`
`end_plugout`	The date and time the session ended	`DATETIME`
`end_plugout_hour`	The hour (in military time) that the session ended	`NUMERIC`
`duration_hours`	The length of the session, in hours	`NUMERIC`
`el_kwh`	Amount of electricity used (in Kilowatt hours)	`NUMERIC`
`month_plugin`	The month that the session started	`VARCHAR`
`weekdays_plugin`	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	
1	AsO2	
2	UT9	

Projects Data DataFrame as `most_popular_shared_start_times`

```sql
-- most_popular_shared_start_times
SELECT
    weekdays_plugin,
    start_plugin_hour,
    COUNT(start_plugin) 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;
```

i...	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

Projects Data DataFrame as `long_duration_shared_users`

```sql
-- 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	16.845833
1	Share-17	12.8945555
2	Share-25	12.2144747
3	Share-18	12.0888071
4	Share-8	11.5504308
5	AdO3-1	10.3693869

Rows: 6