# State-Wise Distribution of EV Charging Stations in USA

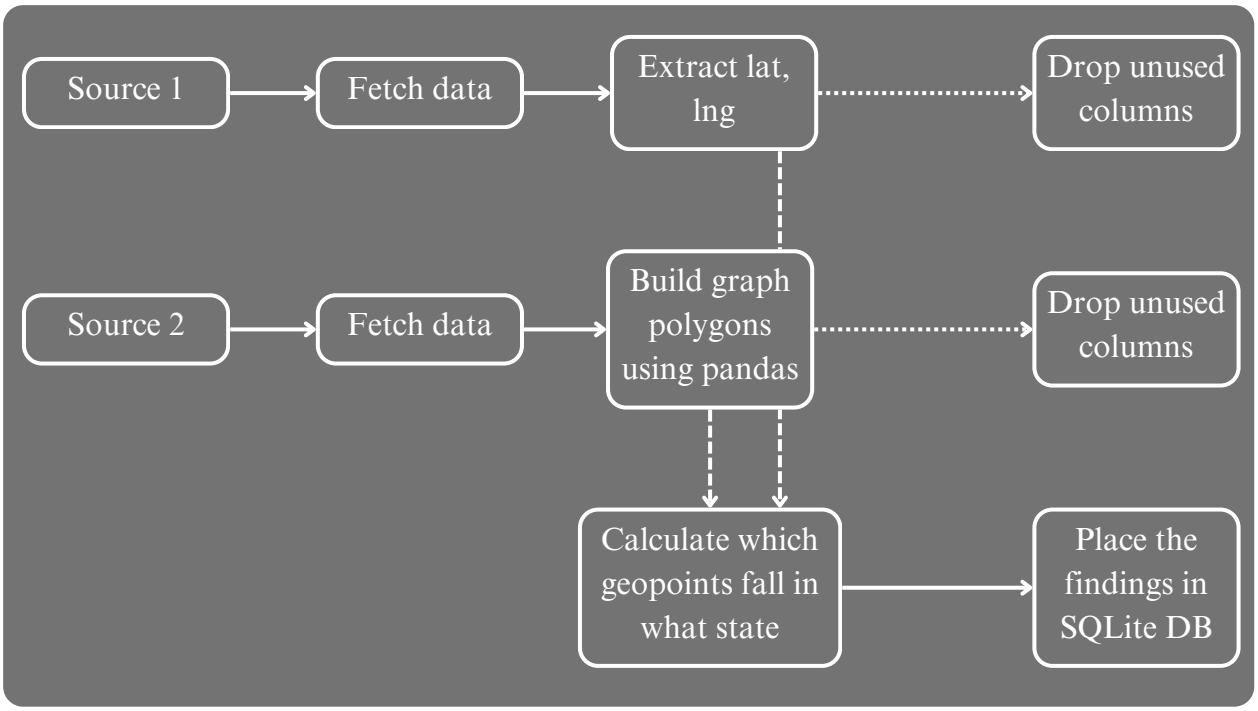
## Data Report

**Question: What states in the U.S. has the best infrastructure for Electric Vehicle?**

Adoption of EV is extremely important for first world countries like U.S. and increase the dependence of industry on renewable energy resources. One of the fundamental parts of EV infrastructure is EV Charging Stations.

This study analyzes the EV Charging Stations available in different states of the U.S. and offers insights for organizations depicting the states and counties with the best EV infrastructure.

## Data Pipeline




**Considerations**

- Use of JSON - Most of the data extracted is available in JSON. Therefore, the pipeline is built with the usage of JSON in consideration.
- Data cleaning - The data extracted had columns irrelevant to the project. Most of these are dropped wherever necessary.
- Error Handling - The pipeline makes sure the data coming is in a standard form. If there is any deviation in the prescribed data structure or any other errors (e.g. failure in fetching the data), the pipeline logs the error to the user via CLI.
- Language - Originally most data was manually converted to CSV and then used in the pipeline (in Jayvee). However, for an automated pipeline, the language was converted to Python for ease.

## Data Sources

### Source 1 - United States Electric Vehicle Charging Locations

Link: Hugging Face - United States Electric Vehicle Charging Locations
License: Apache 2.0 (Mentioned on the data host link)
Format: JSON (Structure as follows)

```
[
  {
    lat: float64,
    lng: float64,
    metadata: {
      ...
    }
  }
]
```

### Source 2 - Cartographic Boundary Files

Link: US Census Bureau - Cartographic Boundary Files
License: Copyright protection is not available for any work of the US Government. The Census Bureau does request to be cited as a source.
Format: JSON (Structure as follows)

```
{
  "type": string,
   "features": [
     {
       "type": string,
       "properties": {
         "GEO_ID": string,
         "STATE": string,
         "NAME": string,
         "LSAD": string,
         "CENSUSAREA": float64
       },
      "geometry": {
        "type": string,
        "coordinates": [
            [
              [
                  float64, // longitude float64
                  float64 // latitude float64
              ],
               ...
            ]
         ]
      }
    },
    ...
  ]
}
```

## Results

### Output data of your data pipeline

- Output table consists of an SQLite DB (uploaded in **./data** directory) under the table **US_STATES_WITH_EV_CHARGING_STATIONS** containing columns "**US_STATE_NAME**" and "**NUMBER_OF_EV_CHARGING_STATIONS**".
- Output data as an SQLite Table - easily viewable and with no complexity in the underlying data structure.
- Data Quality - Most data quality standards are met e.g. accuracy, completeness, consistency, recency, and relevancy.