ANALYSIS OF EV CHARGING STATIONS DISTRIBUTION GLOBALLY

**Link: https://github.com/DanYang927/project.git**

As more and more people use electric vehicles (EVs), it is important to have more charging stations. This project provides an interactive dashboard that visualizes the distribution and characteristics of EV charging stations around the world to support better decision making on EV infrastructure.

**Key Findings**

**Country Distribution:** The analysis mapped charging stations across various countries. A choropleth visualization indicates significant disparities, with some regions(North America) having dense networks while others lack sufficient infrastructure.

**Market Share by Operators:** In the data analyse, companies market share show similar distribution. Out of 5000 stations, "Tesla" owned the most having 1029 stations while company "Ionity" had the least – 978 charging stations.

**Customer Ratings:** An evaluation of customer reviews suggests that user satisfaction is similar across different charging station operators. This indicates customer satisfaction might be influenced not by specific operators, but by other factors (pricing, distance to city, availability, etc.)

**Charger Type Distribution:** Operators offer different charger types, AC Level 2 chargers are the most common, while DC fast chargers are less widespread.

**Methodology & Challenges**

The analysis involved data cleaning to remove incomplete entries and ensure accurate geographic coordinates. Mapping city-to-country associations required external datasets ("Natural Earth").

Python Libraries: pandas, geopandas, plotly, geonamescache

Visualizations: Interactive choropleth map, bar charts, grouped bar charts.

**Insights & Next Steps**

This analysis relied on a basic Kaggle dataset with only 5000 entries across the last decade, which limits this works ability to reflect global trends accurately. A lot of data focused on the U.S., while the European and Asian regions were quite underrepresented.

The Python code written for this final project rather serves as a good template for data formatting and analysis. It can help visualize EV charging station data and explore some trends globally.

For future steps, a more extensive dataset covering diverse regions would allow for a more complete and balanced analysis. If datasets with larger sample size, stronger correlations were given, that could help uncover more interesting trends, like station location prediction, charger type preferences, also economic factors that may influence EV stations adoption.

