PROJECT-1

Project Summary

The Python project analyzes electric vehicle (EV) registration data from a dataset using pandas, seaborn, and matplotlib libraries. The dataset contains information such as VIN, county, city, state, model year, make, model, electric vehicle type, range, and more. The goal is to gain insights into EV adoption trends, geographic distribution, popular manufacturers, vehicle types, electric ranges, and future market forecasts.

Project Description

This project leverages Python libraries to explore and visualize trends in EV adoption based on a comprehensive dataset. Here's a breakdown of the analysis:

1. **Data Loading and Cleaning**:
    - The dataset (Electric_Vehicle_Population_Data.csv) is loaded using pandas.
    - Initial exploration includes checking data types, missing values, and dropping rows with null values to ensure data integrity.

2. **Exploratory Data Analysis (EDA)**:

    - **EV Adoption Over Time**: Visualizes the number of EV registrations by model year using a bar plot. It shows a significant increase in registrations from 2016 onwards, with 2023 showing the highest adoption.
    - **Geographical Distribution**: Analyzes EV registrations across top counties (King, Snohomish, Pierce) and their respective cities using bar plots. Highlights Seattle as the leading city in EV registrations.
    - **Electric Vehicle Types**: Examines the distribution of battery electric vehicles (BEVs) versus plug-in hybrid electric vehicles (PHEVs) using a bar plot, indicating BEVs as the preferred choice.
    - **Popular EV Manufacturers and Models**: Identifies the top manufacturers (Tesla, Nissan, Chevrolet) and their most registered

models using bar plots. Tesla's Model Y emerges as the most popular model.
    - **Electric Range Analysis**: Displays the distribution of EV ranges using a histogram, revealing a skewed distribution towards lower ranges, despite availability of higher range EVs.
    - **Average Electric Range Trends**: Plots the average electric range over model years, showcasing an increasing trend over time with a notable peak around 2020.
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3. **Future Market Forecast**:
    - Uses curve fitting to forecast EV registrations for 2024 and beyond based on historical data trends, predicting substantial growth in EV registrations.
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4. **Conclusion**:
    - Summarizes findings from the analysis, highlighting the accelerating trend in EV adoption and market expansion. Emphasizes a promising future for the EV industry based on forecasted data.

Conclusion

This Python project not only provides insights into current EV adoption patterns but also forecasts future trends, demonstrating the growing consumer interest and market potential for electric vehicles. The visualizations and analyses conducted offer valuable information for stakeholders in the EV industry and researchers studying sustainable transportation solutions