Indian EV Market Dashboard Documentation

1. Project Overview

The Indian EV Market Dashboard is a data-driven Streamlit application built to analyze trends in electric vehicle (EV) adoption across India from 2001 to 2024. It provides interactive visualizations on EV sales, categories, manufacturers, infrastructure, and more.

2. Data Sources

The dashboard uses cleaned datasets extracted from a zip archive, including:

- EV Sales by Maker & Category (2015-2024)
- EV Maker by Place
- Operational Public Charging Stations (PCS)
- Vehicle Class-wise Registrations
- EV Category Trends (2001-2024)

3. Data Cleaning Steps

- Missing numeric values were filled using column means.
- Categorical missing values were filled using the most frequent value.
- Duplicates were dropped using `drop_duplicates()`.
- Date columns were parsed and standardized using `pd.to_datetime()`.
- Commas in numeric strings were removed, and types were converted to integers.
- Text columns were stripped and case-standardized using `.str.strip().str.title()`.

4. Streamlit Dashboard Structure

The Streamlit app consists of multiple tabs navigated from a sidebar:

- Getting Started: Overview and project introduction
- EV Makers by Place: Geographic analysis of manufacturers

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- EV Categories: Category trends, growth rates, and distribution

- EV Sales by Maker & Category: Year-wise sales, top makers, growth trends

- Charging Infrastructure: PCS distribution, histograms, and pie charts

- Vehicle Class: Scatter plots and comparison across vehicle types

5. Example Code Snippets

Loading and cleaning CSVs:

```python
df = pd.read_csv('ev_sales_by_makers_and_cat_15-24.csv')
df.fillna(df.mean(numeric_only=True), inplace=True)
df.drop_duplicates(inplace=True)
```

Sidebar with on-hover tabs:

```python
selected_tab = on_hover_tabs(
    tabName=['Getting Started', 'EV Makers by Place', ...],
    iconName=['arrow_forward'] * 6, ...
)
```

6. Deployment

The app is designed to be deployed using Streamlit Cloud or any Python web environment. Ensure all CSVs are available in the working directory or served via a public link.