

## 1. Data Collection:

Data is taken from the kaggle datasets: [Dataset Link](#)

State names data extraction: [state\\_codes](#)

## 2. Data Cleaning:

Source code & steps can be found here: [Github](#)

- Cleaned the data using Excel software (Optional: If the data size is huge, Python can be more effective for large datasets like this, Performed EDA using Python as well).
- Corrected mixed feature values in the original data using Excel and saved the cleaned data as raw\_data.csv.
- Corrected the data types.
- Removed duplicates.
- Performed text cleaning for all text features.
- Removed columns that are not useful for the analysis.
- Imputed missing values in each feature using relevant methods. Imputed missing values in condition columns with Make & Model pairs.
- Created new features, such as state name and sales date, as required for the analysis.

## 3. Data Analysis:

### Business objective:

A car selling company wants to expand its operations by opening new stores in various states. To make informed decisions about which car models to stock in these new stores, they need to understand which car models and characteristics are popular in each state. By analyzing relevant data, such as sales figures and customer preferences, they can identify the best-selling models in each region and establish partnerships with the corresponding manufacturers to stock their cars accordingly.

Our task is to assist them in analyzing the data to provide actionable insights for their expansion strategy and create an interactive dashboard.

**Problems to Solve:** As management wants to know the sales performance from all countries their business operates in, we will use filters for countries and states to let the user interact with the dashboard and get the insights needed for their analysis.

1. Create KPI metrics based on the given data:

- a. Percentage of Total Revenue
- b. Percentage of Total Sales Volume
- c. Median Condition
- d. Median MMR (Average Condition of Car Makes and Models)
- e. Median Odometer (Mileage Insights)

2. Identify Top Manufacturers in Each State: Top 5 (by default - users can select up to Top 10)

3. Identify Top Car Models in Each State: Top 5 (by default)

4. Analyze Additional Features and Car Body Types

5. Top Trending Car Colors

6. Transmission Type Demand Analysis: Determine the demand for automatic vs. manual transmissions in

each state.

#### 7. Sales Trends Analysis:

- Monthly Sales Trend: Group sales data by month to identify seasonal patterns or trends in sales volume and revenue.
- Quarterly Sales Trend: Analyze sales data on a quarterly basis.
- Annual Sales Trend: Analyze sales data on an annual basis.

Additional Analysis:

- Correlation with Other Factors
- Selling Price Distribution: A histogram would be a great choice.
- Sales Comparison by Manufacturer and Model

## 4. Data Visualization:

Created a dashboard using Tableau Public: [Vehicle Sales Dashboard](#)

## 5.Recommendations:

- **Ensure Adequate Stock:**
  - Make sure to have stock for those Top models and featured cars in advance in the states where you intend to open new stores.
- **Targeted Marketing Campaigns:**
  - Perform campaigns in the targeted states where you plan to launch new business operations to understand the requirements of car buyers.
- **Seasonal Sales Trends:**
  - Understand the seasonal trends in car sales and make business decisions accordingly.