

CARS EDA PROJECT DOCUMENT:

- Developed an end-to-end EDA web application using Python & Streamlit with automated visualization for categorical and numerical features.
- Implemented **dynamic visualization engine** that automatically selects countplots for categorical and histograms/KDE for numerical features.
- Enhanced decision-making by identifying **key factors affecting car prices** through correlation and distribution analysis.
- Developed an end-to-end Streamlit EDA program that uses automated visualizations to reduce manual analysis time by around **70%** when evaluating **5,900+ automobile records with more than 15 attributes**.
- Implemented dynamic analysis to improve insight accuracy by using **countplots** (eight or more categories) for categorical features and **histogram/KDE with skewness** detection for numerical features.
- Key pricing drivers were identified, demonstrating a negative correlation of **-0.63 with kilometers driven and a 0.66 connection between engine value and price**, supporting data-driven valuation.

Tools & Technology used: Python, Numpy, Pandas, Matplotlib, Seaborn, Streamlit, Vs Code, Jupyter Notebook

Why this project ?

Used automobiles are in high demand in the Indian market right now. The preowned automobile market has grown over the years and is currently larger than the new car market, notwithstanding the recent slowdown in sales of new cars. Approximately 4 million used cars were purchased and sold in 2018–19, compared to 3.6 million new cars. Sales of new cars are slowing down, which may indicate that demand is moving toward the used car market. In fact, rather than purchasing new vehicles, several automobile sellers swap out their old vehicles for used ones.

Features ?

1. S.No. : Serial Number
2. Name : Name of the car which includes Brand name and Model name
3. Location : The location in which the car is being sold or is available for purchase Cities
4. Year : Manufacturing year of the car
5. Kilometers_driven : The total kilometers driven in the car by the previous owner(s) in KM.
6. Fuel_Type : The type of fuel used by the car. (Petrol, Diesel, Electric, CNG, LPG)
7. Transmission : The type of transmission used by the car. (Automatic / Manual)
8. Owner : Type of ownership
9. Mileage : The standard mileage offered by the car company in kmpl or km/kg
10. Engine : The displacement volume of the engine in CC.
11. Power : The maximum power of the engine in bhp.
12. Seats : The number of seats in the car.
13. New_Price : The price of a new car of the same model in INR Lakhs.(1 Lakh = 100, 000)
14. Price : The price of the used car in INR Lakhs (1 Lakh = 100, 000).

Problem?

1. Does various predicated factors effect the price of the used car .?
2. What all independent variables effect the pricing of used cars?
3. Does name of a car have any effect on pricing of car.?
4. How does type of Transmission effect pricing?
5. Does Location in which the car being sold has any effect on the price?
6. Does kilometers_Driven,Year of manufacturing have negative correlation with price of the car?
7. Does Mileage ,Engine and Power have any effect on the pricing of the car?
8. How does number of seat ,Fuel type effect the pricing.?

Important points

1. There are more soft parameters which also should be considered when buying a car, the wear and tear the car has been through and how much the company will have to work on car to make it ready for sale.
2. If the car as already been in some kind of accident that would also effect the price.
3. Other good to have feature like AC,Moon roof,Airbags can also have impact on the price.
4. Car model that are too old will depreciate a lot can impact the demand .
5. Brands like Maruti, Hyundai ,Honda are low budget and very popular brands in used car market.
6. Mumbai and Hyderabad seems to be more popular in Used car market, need to verify this with more data from other demographic regions. The next step post that would be to cluster different sets of data and see if we should make multiple models for different locations/car types.
7. Need to acquire more Automatic cars to earn more profits, as this car sell at higher prices.
8. With Increasing petrol rates diesel car are in more demand in recent years, acquiring and selling them can high profits
9. Along with this we can include scheme like take a test drive for half day to pursue customer to buy.
10. We can provide Car maintenance packages where customers pays a small upfront fees and can bring the car for servicing anytime in a year to attract more customers.

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