Project Report -3

ANALYSIS-3

1. The memory usage of the data is around 6.1 mb. How can we reduce the memory usage of the data set?

SUMMARY

1.Choose Appropriate Data Types:

Use more memory-efficient data types (e.g., using int32 instead of int64, float32 instead of float64) for numerical columns to store data efficiently. 2.Downcast Numeric Columns:

Downcast numeric columns using Pandas to reduce memory usage. df = df.apply(pd.to_numeric, downcast='integer') 3.Convert Categorical Data:

Convert categorical variables to the Pandas category data type, which can significantly reduce memory usage. df['category_column'] = df['category_column'].astype('category') 4.Remove Unnecessary Columns:

Drop columns that are not necessary for analysis to reduce the overall memory footprint. 5.Use File Compression Formats:

Use more memory-efficient file formats such as Parquet, Feather, or HDF5, which can store data more efficiently compared to CSV or Excel files. 6.Load Data in Chunks:

Process data in chunks using Pandas' chunksize parameter while reading large datasets to reduce memory usage. 7.Use External Libraries:

Libraries like Dask can handle larger-than-memory datasets by performing operations on smaller chunks of data . 8.Optimize Text Data:

Optimize text data by removing unnecessary characters or using tokenization, especially for free-text fields.

2. What is the Average price of vehicle by fuel type and gearbox type. Give a plot?

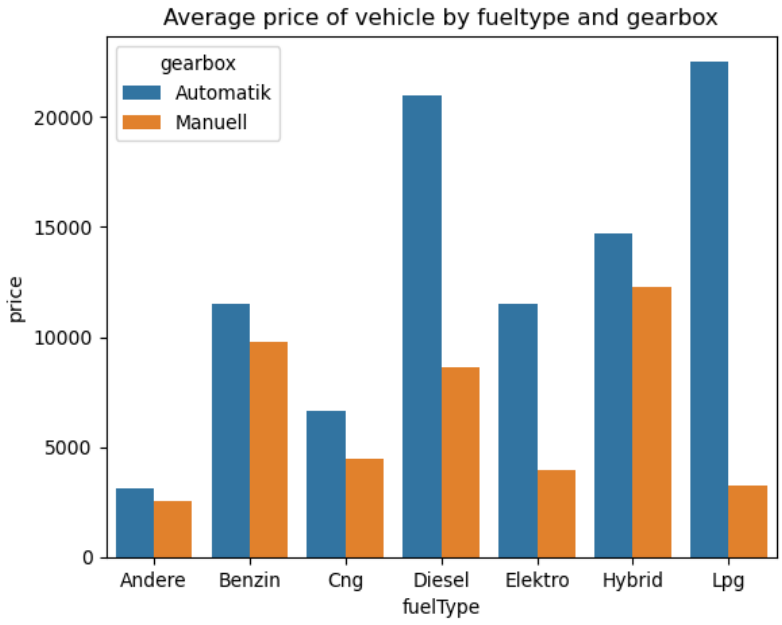
SUMMARY

- I have observed that the average price of vehicle by the fuel type and gearbox type.
- I am took the help of group by function because of group by is used to combine the two column give the result in look like one column.
- Using the mean in numpy module in this question.
- Using set index function in orderly.

```
avg_price_of_vehicle
```

	fuelType	gearbox	price
0	Andere	Automatik	3127.185185
1	Andere	Manuell	2543.164062
2	Benzin	Automatik	11512.902986
3	Benzin	Manuell	9799.083665
4	Cng	Automatik	6631.000000
5	Cng	Manuell	4461.487572
6	Diesel	Automatik	20971.145118
7	Diesel	Manuell	8650.747973
8	Elektro	Automatik	11522.909091
9	Elektro	Manuell	3944.888889
10	Hybrid	Automatik	14715.969697
11	Hybrid	Manuell	12278.607843
12	Lpg	Automatik	22535.269211
13	Lpg	Manuell	3229.065881

- I am analysing the data show the visualize.
- I am took the help of matplot.lib and seaborn with import the two and using bar plot .
- The bar plot visualises the average price of vehicles categorised by their gearbox and fuel type. The average price of vehicle by automatic is more from “LPG” and manual is from “Hybrid” fuel type and gearbox. This plot explains that, it is valuable for understanding the price characteristics of different fuel types and gearboxes.



3. What is the Average power of a vehicle by vehicle type and gearbox type. Give a plot?

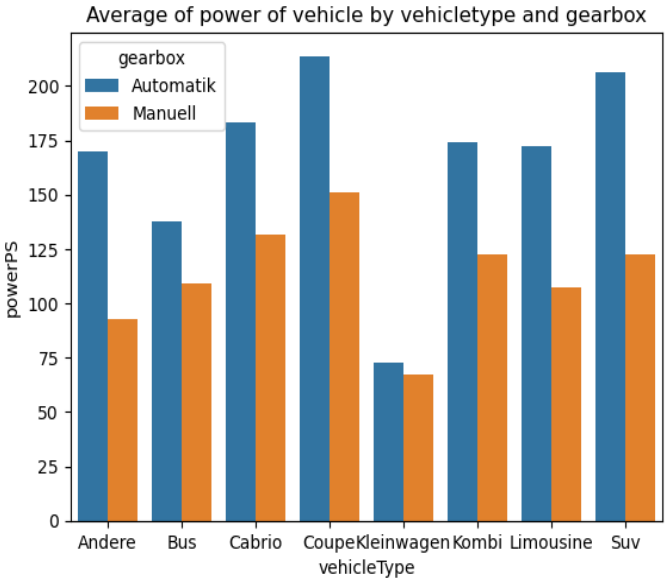
SUMMARY

- I have observed that the average power of vehicle by the vehicle type and gearbox type.
- I am took the help of group by function because of group by is used to combine the two column give the result in look like one column.
- Using the mean in numpy module in this question.
- Using set index function in orderly.

```
avg_power_of_vehicle
```

	vehicleType	gearbox	powerPS
0	Andere	Automatik	169.656766
1	Andere	Manuell	92.989595
2	Bus	Automatik	137.887810
3	Bus	Manuell	109.218067
4	Cabrio	Automatik	183.224539
5	Cabrio	Manuell	131.526974
6	Coupe	Automatik	213.727427
7	Coupe	Manuell	150.958616
8	Kleinwagen	Automatik	72.619872
9	Kleinwagen	Manuell	66.977733
10	Kombi	Automatik	174.016733
11	Kombi	Manuell	122.535184
12	Limousine	Automatik	172.423369
13	Limousine	Manuell	107.419549
14	Suv	Automatik	205.997692
15	Suv	Manuell	122.461934

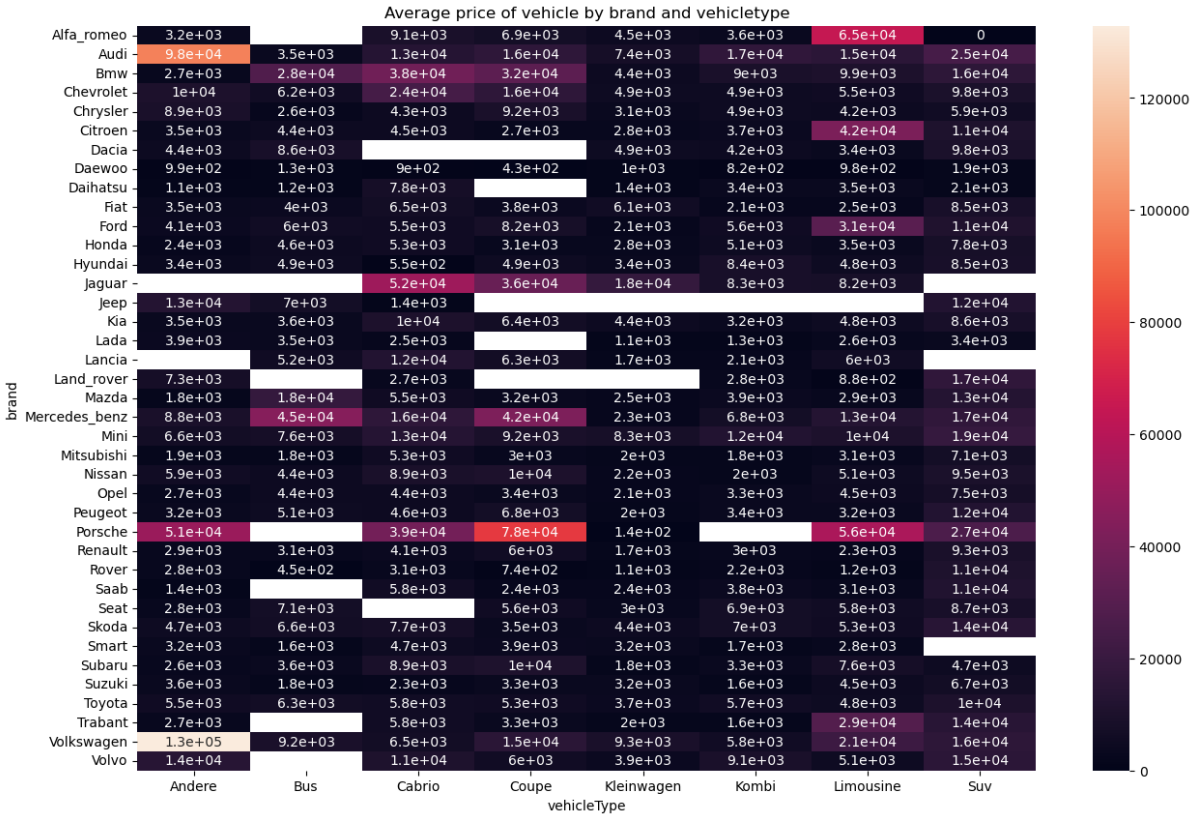
- I am analysing the data show the visualize.
- I am took the help of matplot.lib and seaborn with import the two and using bar plot .
- The bar plot visualises the average power of vehicles categorised by their vehicle types and gearbox. The average power of vehicle is from “Coupe” by vehicle type and gearbox. This plot explains that, it is valuable for understanding the power characteristics of different vehicle types and gearboxes.



4. What is the Average price of a vehicle by brand as well as vehicle type. Use heatmap to explain this?

SUMMARY

- I have observed that the average price of vehicle by the brand as well as and vehicle type.
- I am took the help of group by function because of group by is used to combine the two column give the result in look like one column.
- Using the mean in numpy module in this question.
- Using set index function in orderly.
- I am analysing the data show the visualize.
- I am took the help of matplot.lib and seaborn with import the two and using heat map .
- The heatmap visualising the average prices of vehicles based on their prices and vehicle type. By utilising colour gradients, it allows viewers to quickly identify brands and vehicle types with higher or lower average prices. This visualisation aids in making informed decisions, which ones are more budget friendly, enabling businesses and consumers to strategize effectively in the competitive market.


Average price of vehicle by brand and vehicletype
brand
Alfa_romeo 3.2e+03 9.1e+03 6.9e+03 4.5e+03 3.6e+03 6.5e+04 0
Audi 9.8e+04 3.5e+03 1.3e+04 1.6e+04 7.4e+03 1.7e+04 1.5e+04 2.5e+04
Bmw 2.7e+03 2.8e+04 3.8e+04 3.2e+04 4.4e+03 9e+03 9.9e+03 1.6e+04
Chevrolet 1e+04 6.2e+03 2.4e+04 1.6e+04 4.9e+03 4.9e+03 5.5e+03 9.8e+03
Chrysler 8.9e+03 2.6e+03 4.3e+03 9.2e+03 3.1e+03 4.9e+03 4.2e+03 5.9e+03
Citroen 3.5e+03 4.4e+03 4.5e+03 2.7e+03 2.8e+03 3.7e+03 4.2e+04 1.1e+04
Dacia 4.4e+03 8.6e+03 4.9e+03 4.2e+03 3.4e+03 9.8e+03
Daewoo 9.9e+02 1.3e+03 9e+02 4.3e+02 1e+03 8.2e+02 9.8e+02 1.9e+03
Daihatsu 1.1e+03 1.2e+03 7.8e+03 1.4e+03 3.4e+03 3.5e+03 2.1e+03
Fiat 3.5e+03 4e+03 6.5e+03 3.8e+03 6.1e+03 2.1e+03 2.5e+03 8.5e+03
Ford 4.1e+03 6e+03 5.5e+03 8.2e+03 2.1e+03 5.6e+03 3.1e+04 1.1e+04
Honda 2.4e+03 4.6e+03 5.3e+03 3.1e+03 2.8e+03 5.1e+03 3.5e+03 7.8e+03
Hyundai 3.4e+03 4.9e+03 5.5e+02 4.9e+03 3.4e+03 8.4e+03 4.8e+03 8.5e+03
Jaguar 5.2e+04 3.6e+04 1.8e+04 8.3e+03 8.2e+03
Jeep 1.3e+04 7e+03 1.4e+03 1.2e+04
Kia 3.5e+03 3.6e+03 1e+04 6.4e+03 4.4e+03 3.2e+03 4.8e+03 8.6e+03
Lada 3.9e+03 3.5e+03 2.5e+03 1.1e+03 1.3e+03 2.6e+03 3.4e+03
Lancia 5.2e+03 1.2e+04 6.3e+03 1.7e+03 2.1e+03 6e+03
Land_rover 7.3e+03 2.7e+03 2.8e+03 8.8e+02 1.7e+04
Mazda 1.8e+03 1.8e+04 5.5e+03 3.2e+03 2.5e+03 3.9e+03 2.9e+03 1.3e+04
Mercedes_benz 8.8e+03 4.5e+04 1.6e+04 4.2e+04 2.3e+03 6.8e+03 1.3e+04 1.7e+04
Mini 6.6e+03 7.6e+03 1.3e+04 9.2e+03 8.3e+03 1.2e+04 1e+04 1.9e+04
Mitsubishi 1.9e+03 1.8e+03 5.3e+03 3e+03 2e+03 1.8e+03 3.1e+03 7.1e+03
Nissan 5.9e+03 4.4e+03 8.9e+03 1e+04 2.2e+03 2e+03 5.1e+03 9.5e+03
Opel 2.7e+03 4.4e+03 4.4e+03 3.4e+03 2.1e+03 3.3e+03 4.5e+03 7.5e+03
Peugeot 3.2e+03 5.1e+03 4.6e+03 6.8e+03 2e+03 3.4e+03 3.2e+03 1.2e+04
Porsche 5.1e+04 3.9e+04 7.8e+04 1.4e+02 5.6e+04 2.7e+04
Renault 2.9e+03 3.1e+03 4.1e+03 6e+03 1.7e+03 3e+03 2.3e+03 9.3e+03
Rover 2.8e+03 4.5e+02 3.1e+03 7.4e+02 1.1e+03 2.2e+03 1.2e+03 1.1e+04
Saab 1.4e+03 5.8e+03 2.4e+03 2.4e+03 3.8e+03 3.1e+03 1.1e+04
Seat 2.8e+03 7.1e+03 5.6e+03 3e+03 6.9e+03 5.8e+03 8.7e+03
Skoda 4.7e+03 6.6e+03 7.7e+03 3.5e+03 4.4e+03 7e+03 5.3e+03 1.4e+04
Smart 3.2e+03 1.6e+03 4.7e+03 3.9e+03 3.2e+03 1.7e+03 2.8e+03
Subaru 2.6e+03 3.6e+03 8.9e+03 1e+04 1.8e+03 3.3e+03 7.6e+03 4.7e+03
Suzuki 3.6e+03 1.8e+03 2.3e+03 3.3e+03 3.2e+03 1.6e+03 4.5e+03 6.7e+03
Toyota 5.5e+03 6.3e+03 5.8e+03 5.3e+03 3.7e+03 5.7e+03 4.8e+03 1e+04
Trabant 2.7e+03 5.8e+03 3.3e+03 2e+03 1.6e+03 2.9e+04 1.4e+04
Volkswagen 1.3e+05 9.2e+03 6.5e+03 1.5e+04 9.3e+03 5.8e+03 2.1e+04 1.6e+04
Volvo 1.4e+04 1.1e+04 6e+03 3.9e+03 9.1e+03 5.1e+03 1.5e+04
Andere
Bus
Cabrio
Coupe
Kleinwagen
Kombi
Limousine
Suv
vehicleType
120000
100000
80000
60000
40000
20000
0