ANALYZING THE IMPACT OF CAR FEATURES ON PRICE AND PROFITABILITY

FINAL PROJECT-3

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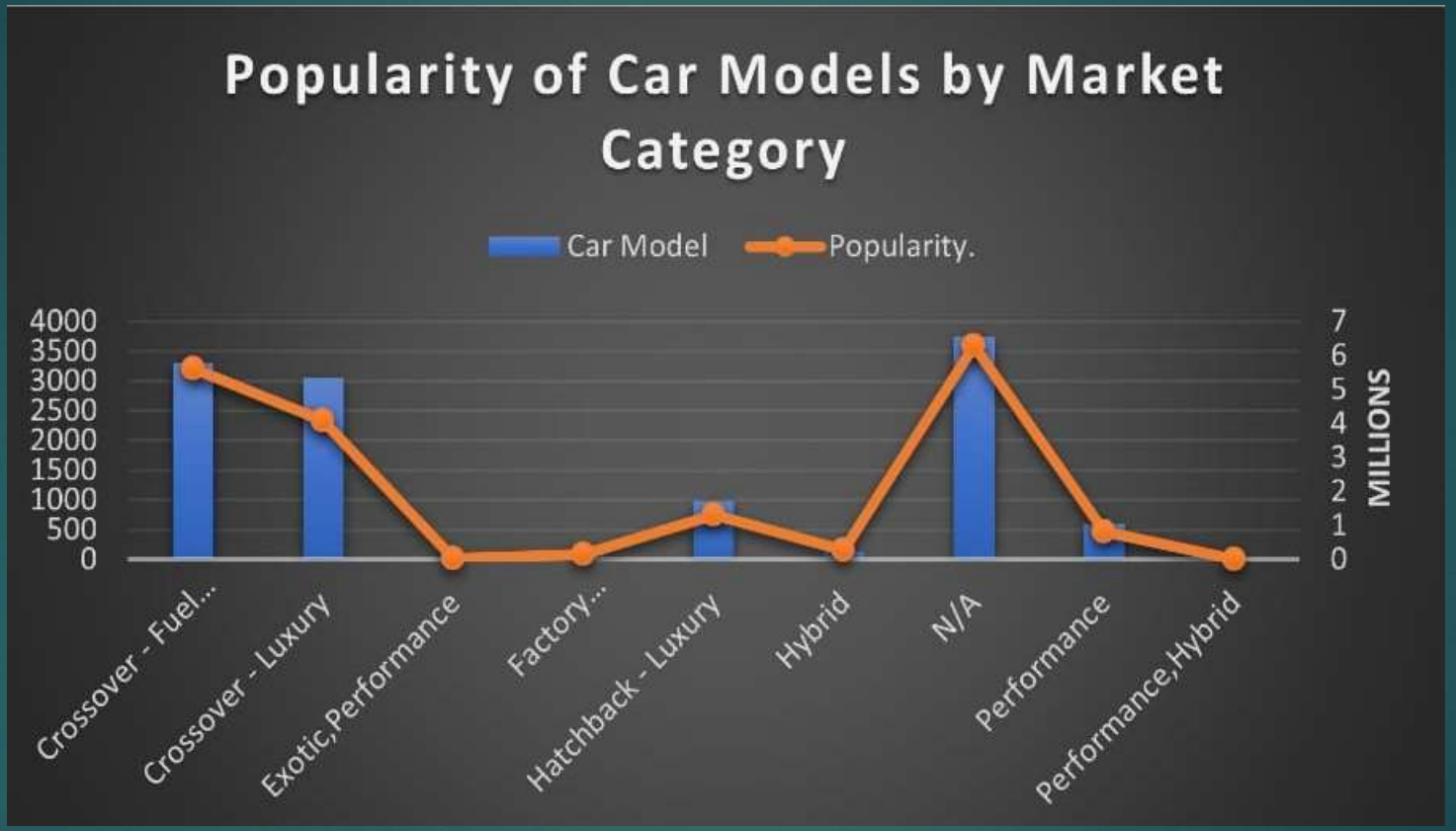
- **Task 1:-** how does the popularity of a car model vary across the different market categories?

Insight and Results:

- In this task, Market categories were consolidated. By grouping similar market categories together, we simplify the chart, for example, grouping of "Crossover, Diesel " and "Crossover, Flex Fuel" under a broader category called :Crossover – fuel type" or "Crossover – Diesel /flex fuel " similarly, you can consolidate other market categories based on similarities.
- Crossover – fuel type has the most car models and is very popular.
- 'Factory Tuner, performance' and 'Exotic – performance' are the market categories which needs Improvement.

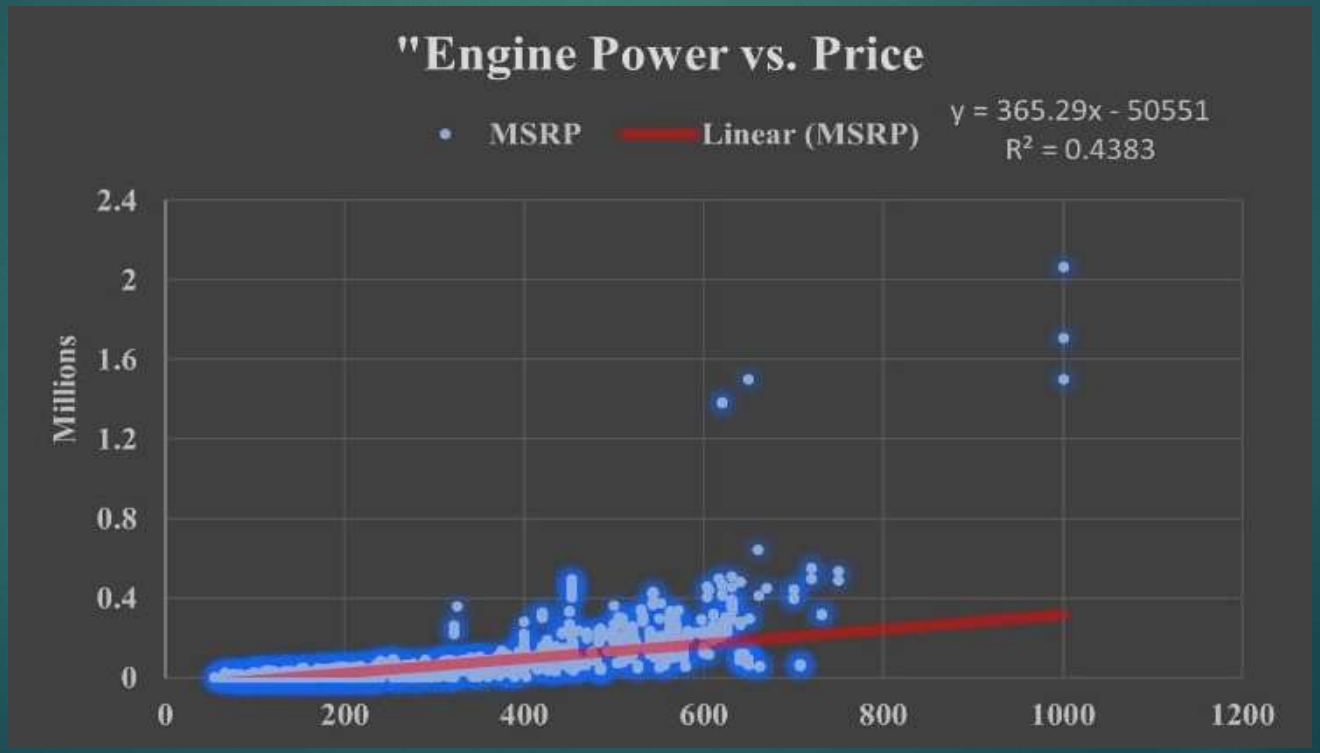

Popularity of Car Models by Market Category
Car Model
Popularity.
4000
3500
3000
2500
2000
1500
1000
500
0
7
6
5
4
3
2
1
0
MILLIONS
Crossover - Fuel...
Crossover - Luxury
Exotic,Performance
Factory...
Hatchback - Luxury
Hybrid
N/A
Performance
Performance,Hybrid

- **Task 2:** what is the relationship between a car's engine power and it's price?

Insight and Results

- By visualizing the data pints on the scatter charts, we can observe the overall pattern or trend between engine power and prices.
- The trendline is providing the insight that there is a positive correlation between engine power and prices and the degree to which they are related.
- The equation y = 365.29x – 505551 suggested a positive linear relationship between engine horsepower (x) and car prices (y). The R^2 value of 0.4383 indicates that approximately 43.83% of the variability in prices can be explained by engine horsepower.

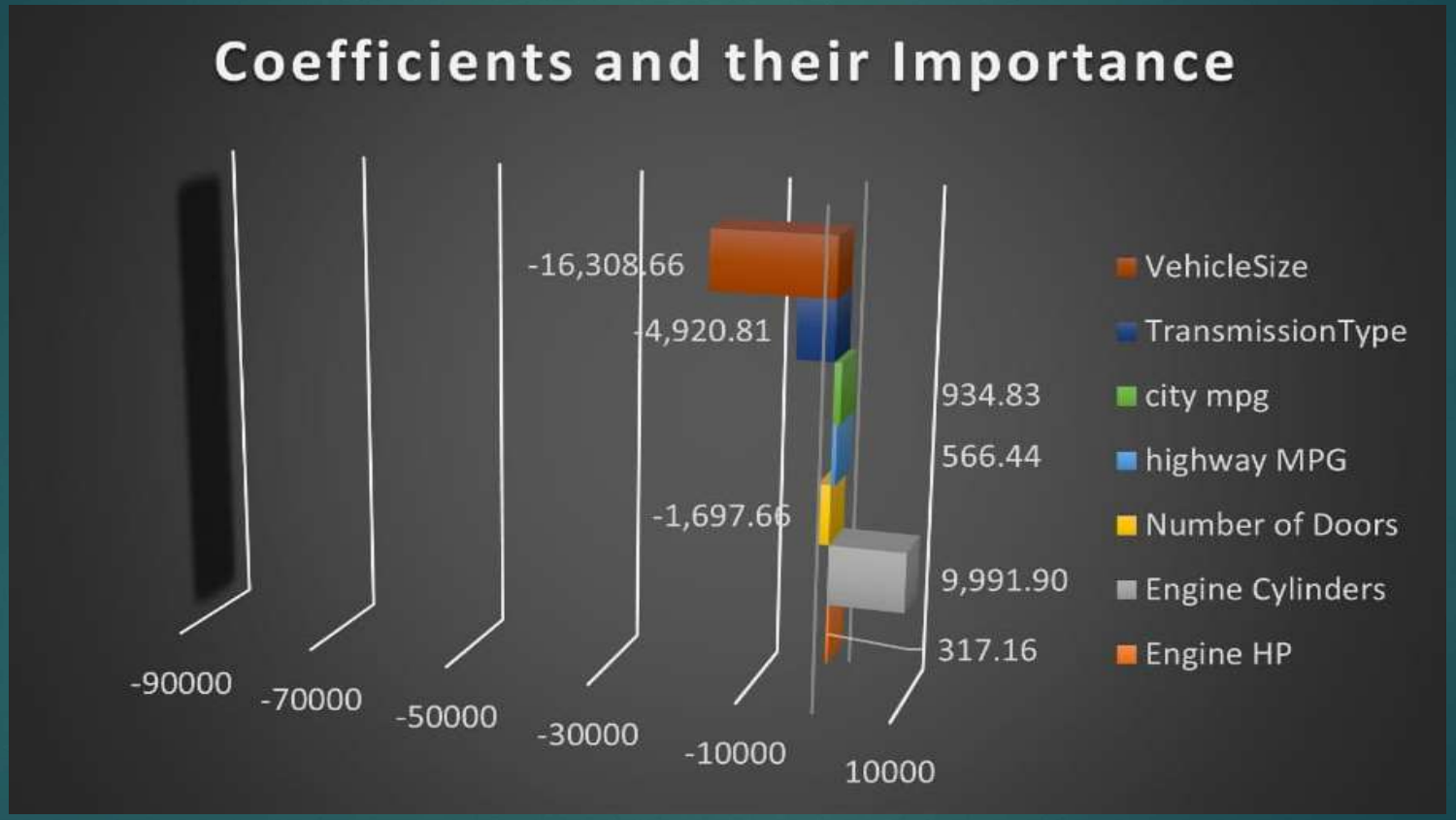
- The correlation of coefficient of 0.66 suggests a moderate positive relationship between engine and horsepower and car prices. As engine horsepower increases, there is a tendency for the car prices to increases as well.



- **Task 3:** which car features are most important in determining a car's prices?

Insight and Result

- Regression analysis allows us to analyse the relationship between the dependent variables (car prices) and multiple independent variables (car features). By analysing the coefficient values obtained from the regression analysis, we can assess the impact of each variable on the car's prices.
- For vehicle style and transmission type, rank system is used, the more the importance, lesser is the Rank.
- Regression Analysis was conducted to the determine car features that have the strongest influences on the prices. The analysis revealed that variables such as engine HP and engine Cylinders positively impact the prices. While variables like number of doors, Highways MPG, city mpg, Transmission type, and vehicle Size have a negative impact

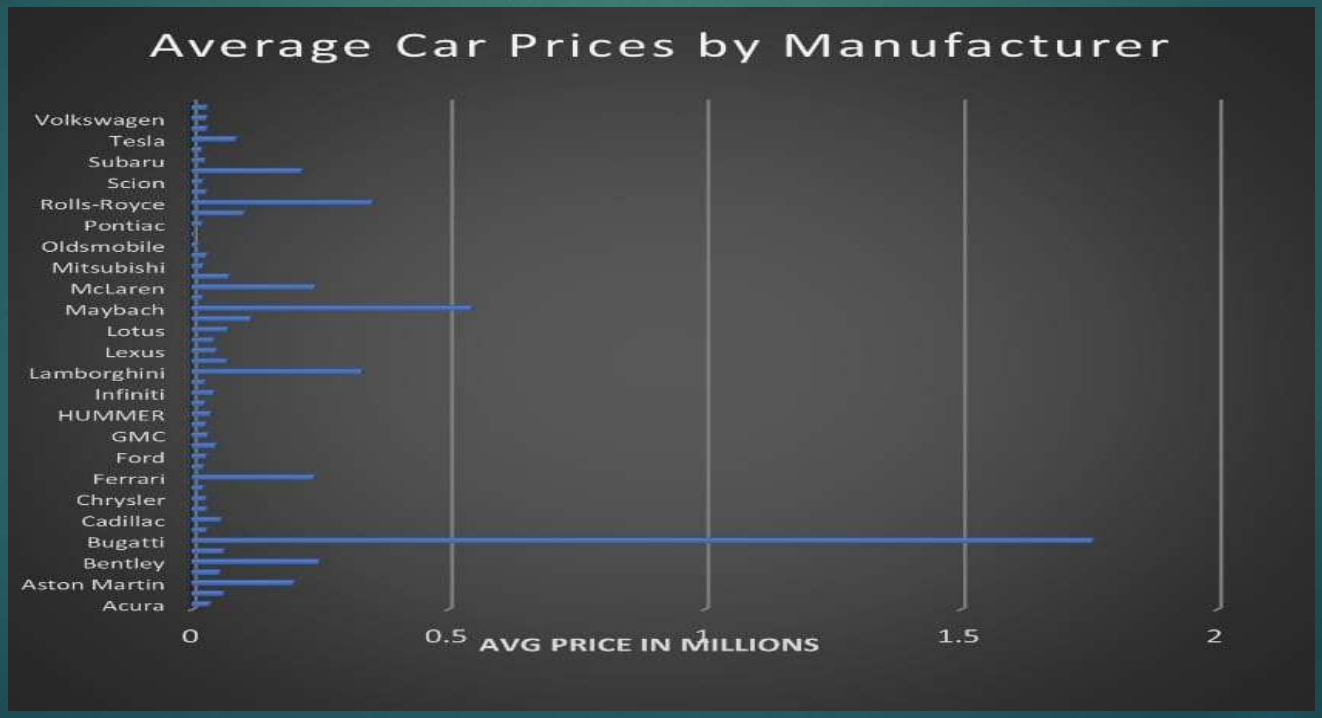

Coefficients and their Importance
-16,308.66
-4,920.81
934.83
566.44
-1,697.66
9,991.90
317.16
VehicleSize
TransmissionType
city mpg
highway MPG
Number of Doors
Engine Cylinders
Engine HP
-90000
-70000
-50000
-30000
-10000
10000

- **Task 4:** How does the average price of a car vary across different manufactures?

Insight and Result

- A):-a pivot table was created to calculate the average price of cars for each manufacture. the pivot table aggregates the data and summarizes the average prices based on the manufacture. This provides a comprehensive overview of the average price range associated with each manufacture.
- B):- a bar chart or a horizontal stacked bar chart was generated to visually represent the relationship between the manufacture and the average price. The bar chart allows for easy to comparison between different manufacture, showcasing the variations in average prices across the industry.

- C):-The result revealed a wide range of average prices, with luxury brands like Aston Martin and Bugatti commanding higher prices compared to mainstream brands like Honda and Toyota. Visualising the relationship between manufactures and average prices through a bar chart provided a clear representation of the prices Distribution.



- **Task 5:-**what is the relationships between fuel efficiency number of cylinders in a car's engine?

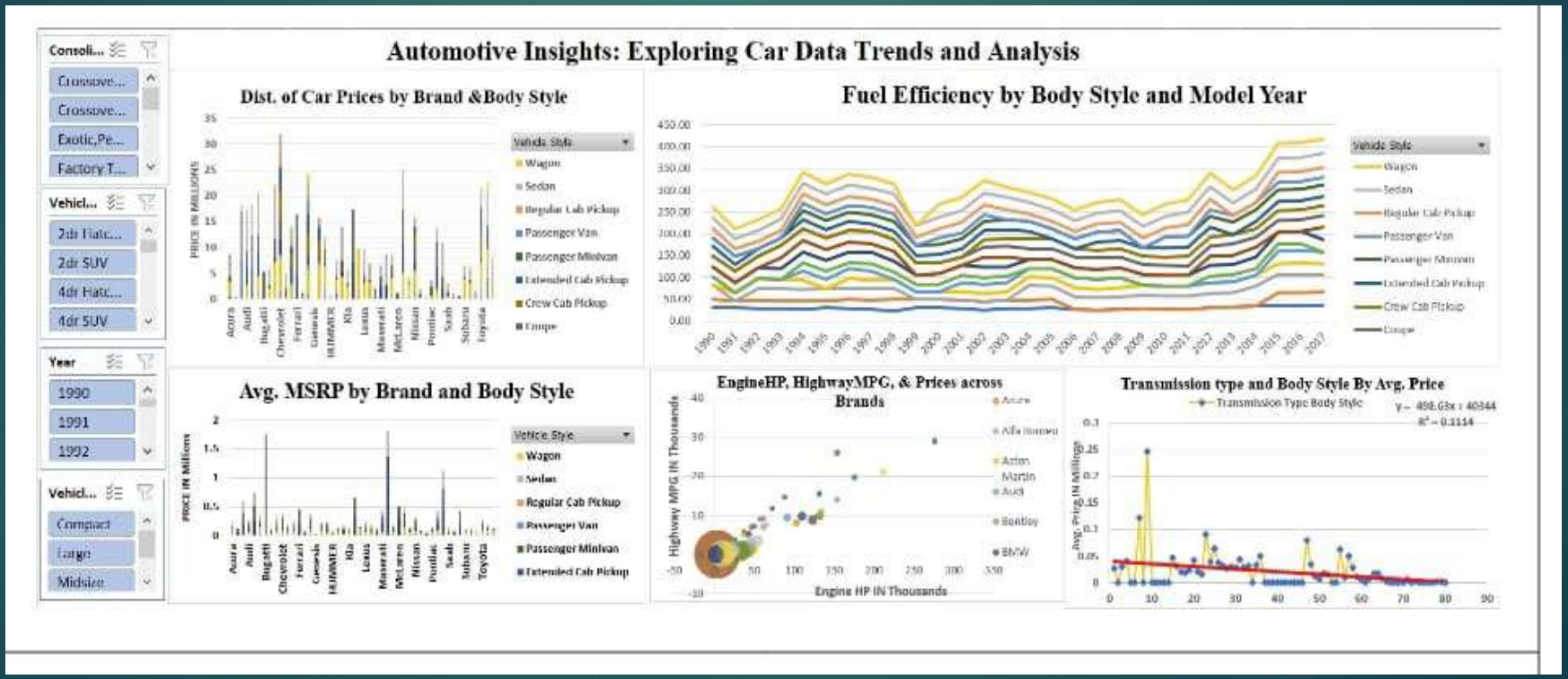
Insight And Result

- A):- a scatter plot was created with the number of cylinders on the x-axis and highway MPG on the y-axis. There is a negative relationship between the number of cylinders in a car's engines and its fuel efficiency, as represented by highway MPG. As the number of cylinders decreases, the car tends to have lower fuel efficiency. This insight can be valuable for car manufactures, buyers, and policymaker in understanding the impact of engine configurations on fuel consumption and making informed decision related vehicle efficiency and environment considerations.
- B):- the correlation coefficient was calculated to quantify the strength and direction of the relationship between the number of cylinders and highway MPG. the correlation coefficient measures the degree of linear association between two variables. In this case, **the correlation coefficient was found to be -0.62** . The negative value indicates an inverse relationship.


Cylinders vs. MPG
y = -3.0018x + 43.478
R² = 0.3864
highway MPG
Linear (highway MPG)
Highway MPG
400
350
300
250
200
150
100
50
0
-50
0
2
4
6
8
10
12
14
16
18
Engine Cylinders

- **Task 6:-**

Building the Dashboard:



Project Description

- this project focused on conducting exploratory analysis of car a dataset to uncover insight and answer important business questions in the automotive industry. The dataset comprises a wide range of information including car make, model, year, engine specifications, transmission type, fuel efficiency, pricing, and more. The primary objective is to gain a deeper understanding various factors that influence car pricing and fuel efficiency, by analysing the datasets, we aim to identify patters, trend, and correlations among different car features and their impact on pricing and fuel efficiency.
- We also investigate the distributions of car prices across different brands and body styles to understands how pricing varies within these categories. Furthermore, we explore the relationship between transmission type and body style with the cars suggested retail prices (MSRP) to examine their impact on pricing. Another area of focus is analysing how fuel efficiency varies across different body styles and model years. This allows us to observes trends and changes in fuel efficiency over time and across different cars types. Additionally, we examine the relationship between car brands and

- The cares horsepower, MPG, and price, by visualizing this information in a bubble chart, we can identify variations and compare different brands based on these attributes.
- Throughout the project, through data cleaning and processing steps were undertaken to ensure data integrity, missing values were handled, duplicates were removed and data formats were standardized to facilitate accurate analysis. The project make certain assumptions, such a assuming diverse sample of car in the market and assuming the accuracy of the provided data. These assumptions enables us to derives meaningful insights and recommendation from the analysis.
- Overall, this project aims to provide valuable insights and actionable information to stakeholder in the automotive industry them to make informed decision related to pricing strategies features enhancements, and fuel efficiency improvements.

Approach

- Our project utilized descriptive statistics, visualization techniques, and modelling to analyse the car dataset and address the business questions.
- We employed descriptive statistics to summarize the data and gain insights into various car attributes.
- Visualizations technique such as a pivot tables, charts and plots were used to represent the data visually and identify patterns and trends.
- Regression analysis was perform to identify the key variables affecting car prices.

Tech-Stack Used:

- Microsoft Excel was the primary software employed for this project, providing a powerful and comprehensive toolset for data analysis and visualization. With its wide range of features, such as pivot tables, charts, and formulas, Excel facilitated the manipulation and Examinations of the car datasets.
- The decision to utilize Excel was driven by its widespread adoption and familiarity in the business and analytics domains, making it an accessible, choice for users with varying levels of expertise.