

The background of the slide is a photograph of a car's side-view mirror. The mirror's frame is dark and visible. Inside the mirror, a road stretches into the distance under a sunset sky. The sun is a bright, glowing orb on the horizon, casting a long, shimmering reflection on the wet pavement. The sky is filled with soft, horizontal bands of orange and yellow light. The car's body, visible in the foreground of the mirror's reflection, is dark and sleek.

Top 5 Car Brands Sales in 2014 - 2015

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Introduction

This analysis is to determine which car brand sells the most and understand the factors that make it superior compared to its competitors

Source Dataset: [Kaggle Vehicle Sales Data](#)

Tools:

- Python (Pandas, Seaborn, Matplotlib, Wordcloud, Numpy, Plotly)
- Tableau Public (Dashboard)
- Link Dashboard: [Dashboard](#)

Data & Cleaning Process

This dataset contains **558,837 records**. To identify the top 5 car brands by total sales, I:

- Group by brand, sum selling prices, sort descending, and select the top 5.
- **Found 269,360 records (48.2% of total data)** belong to these top brands.
- **Detected 39,034 missing values**, mostly in transmission.

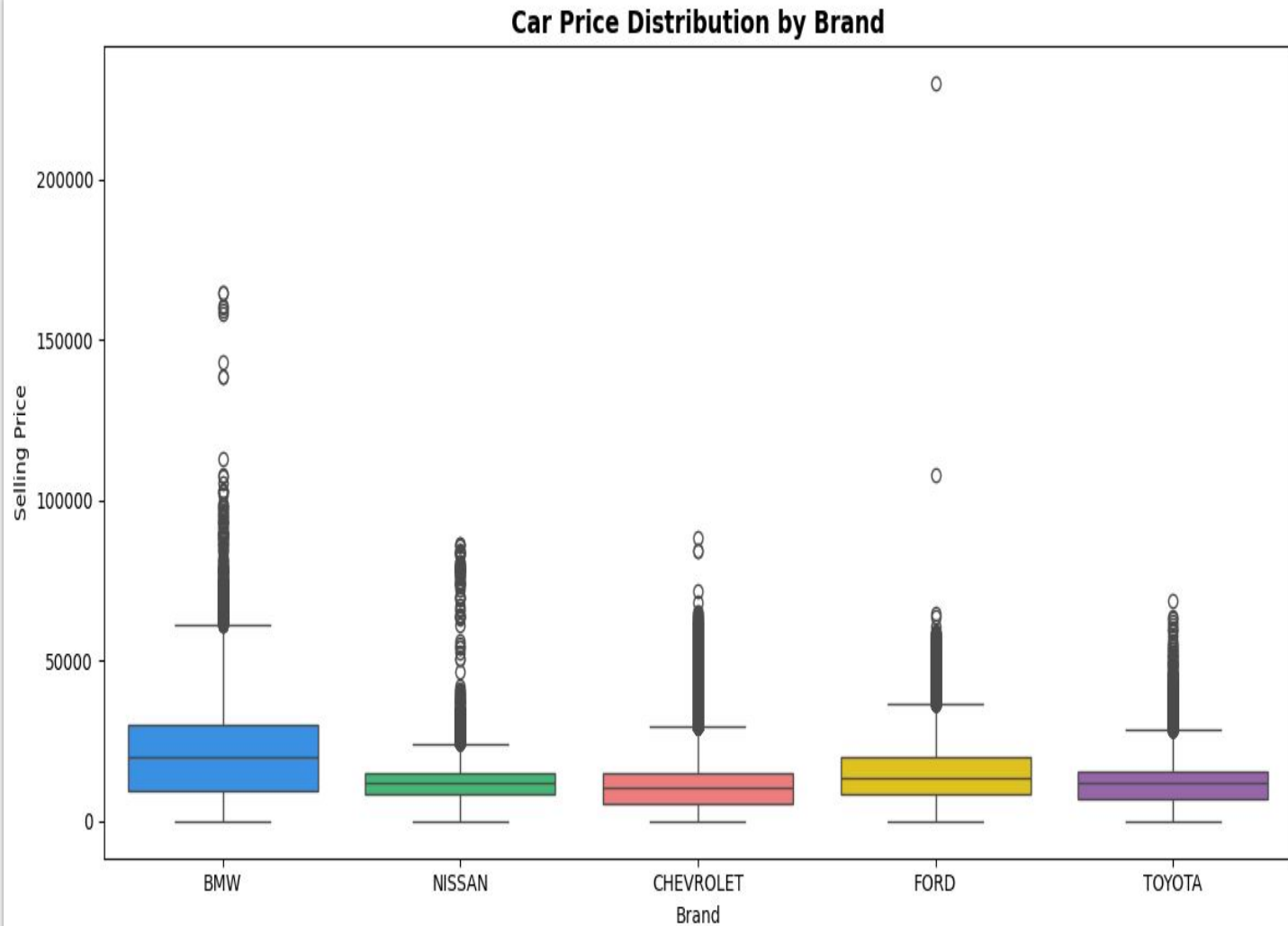
To improve accuracy, missing values are being filled using **VIN (Vehicle Identification Number)** to retrieve brand, model, and other details.

Summary Exploratory Data Analysis

Brand	Count Car	Average Sales	Median Sales	Maximum Sales	Standard Deviation Sales
BMW	20.793	21.474	20.100	165.000	14.681
Chevrolet	60.587	11.939	10.500	88.250	8.890
Ford	93.997	14.496	13.500	230.000	8.618
Nissan	54.017	11.731	12.000	86.400	5.739
Toyota	39.966	12.237	12.100	68.900	7.004

Exploratory Data Analysis & Key Findings

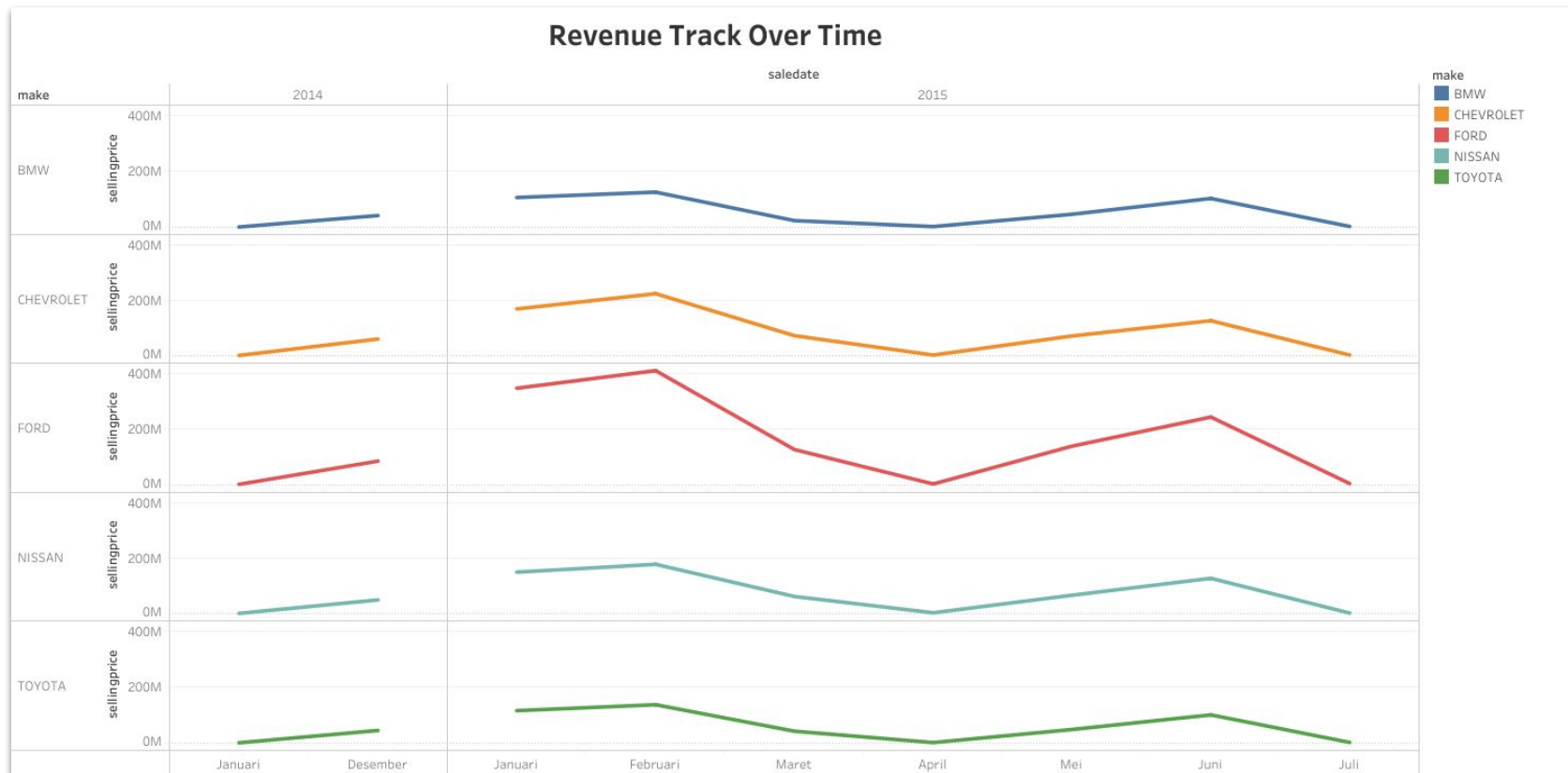
Box Plots: Car Price Distribution by Brand



Insights

BMW shows the highest median price and most extreme outliers, reaching around \$225,000, indicating its position as a premium brand. All car brands have numerous high-price outliers, showing that each offers premium models alongside their more affordable vehicles. Nissan appears to have the most consistent price range among the five brands displayed.

Line Chart: Revenue Track Over Time

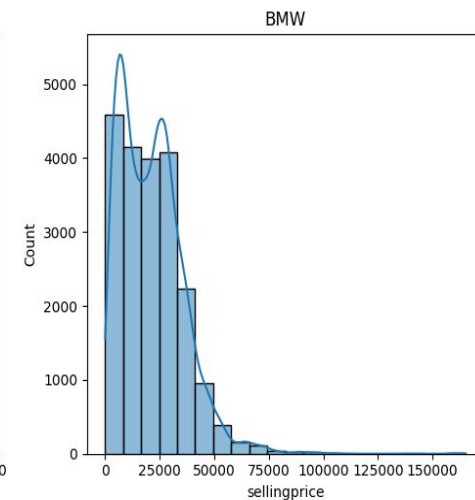
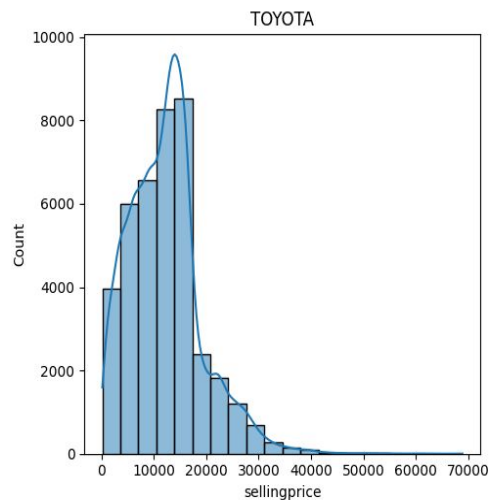
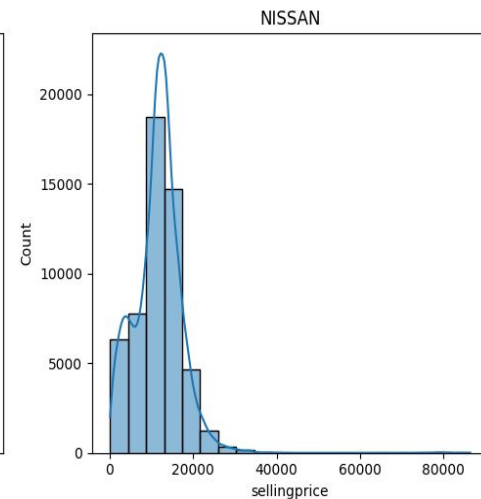
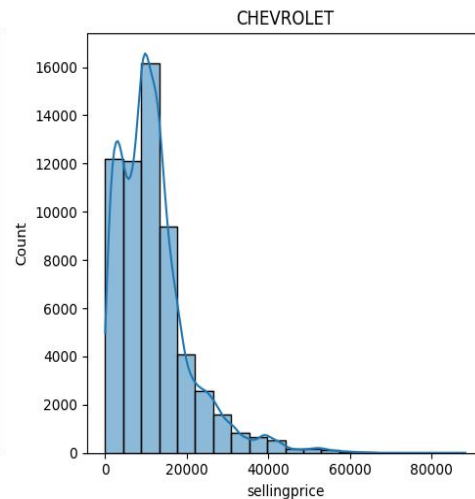
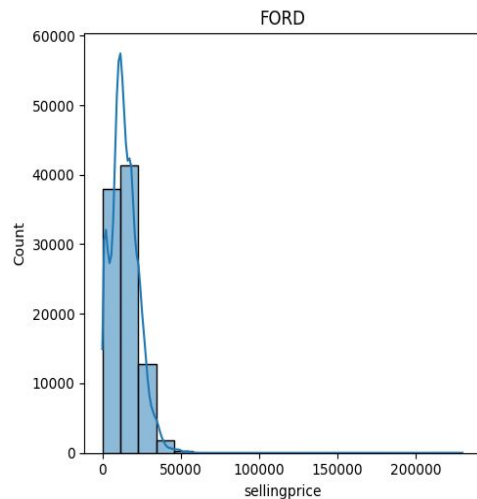


Insights

The 2015 data shows clear seasonal patterns with sales peaks in February and June for all car brands, while April experienced a significant decline. BMW consistently demonstrates the highest sales performance compared to other brands, reinforcing its position as a premium brand as seen in the previous box plot. All brands follow relatively aligned up-and-down trends although with different intensities, indicating that the same market factors affect the entire automotive industry.

Histogram: Car Price Distribution by Brand

Sales Price Distribution of Each Brand

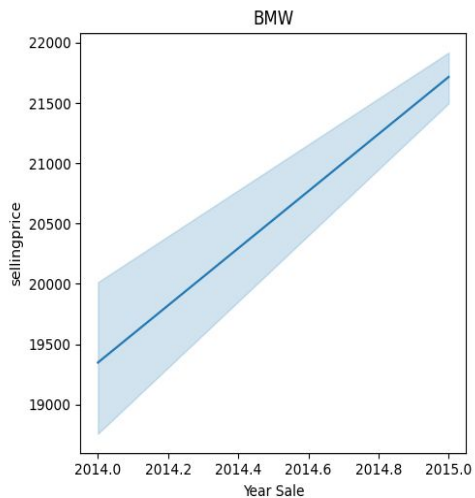
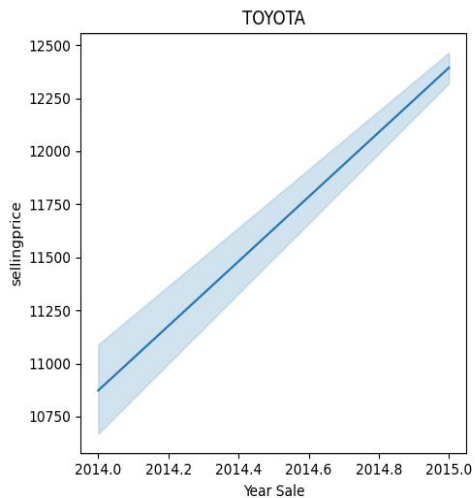
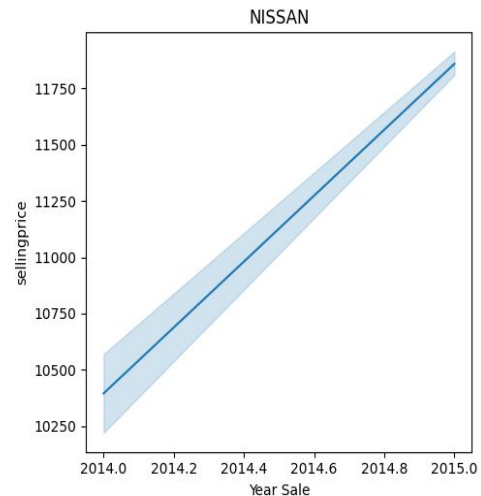
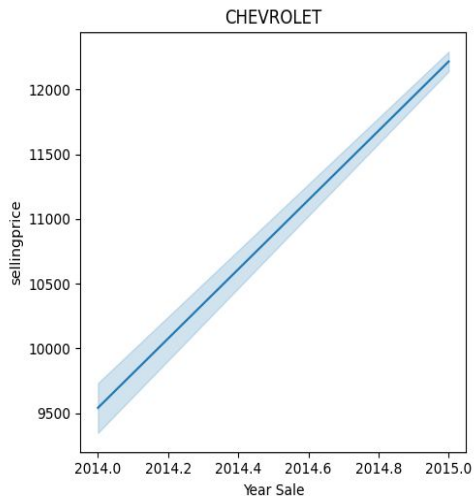
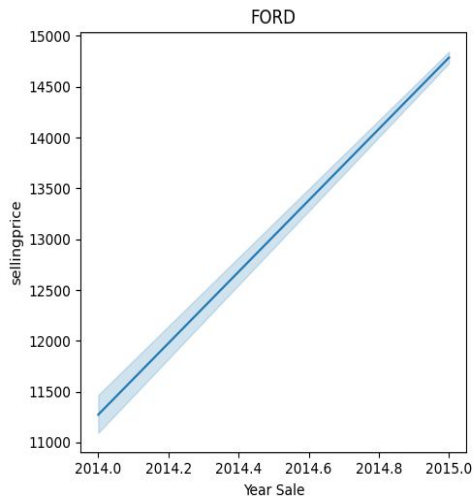


Insights

The majority of car selling prices tend to be concentrated in the lower range with a right-skewed distribution, indicating that most cars are sold at lower prices while only a few have high prices. BMW has a wider price range compared to other brands, while Toyota shows a more even distribution compared to Ford, Chevrolet, and Nissan.

Line Chart: Sales Trends in 2014 - 2015

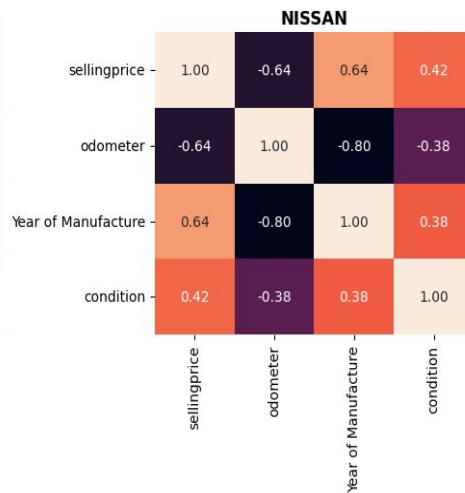
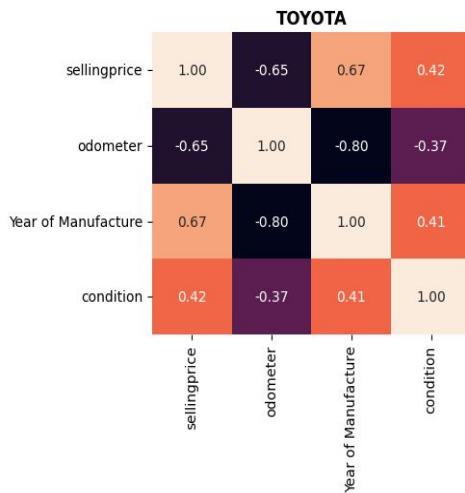
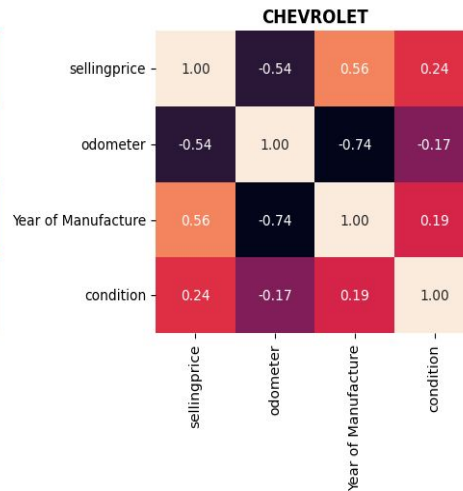
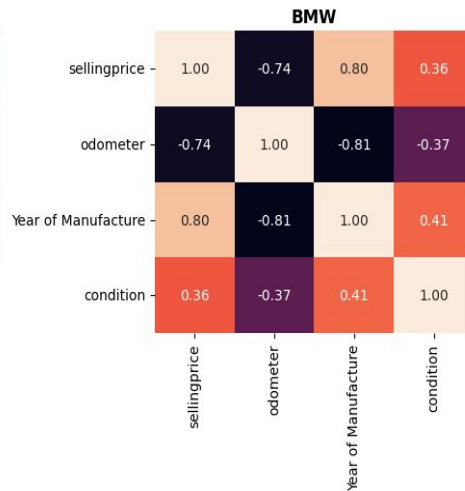
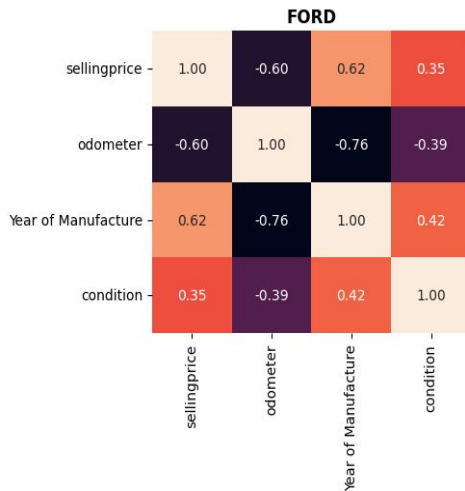
Sales Trends Over Time



Insights

In general, all brands experienced an increase in selling price from 2014 to 2015, with BMW having the highest average price compared to other brands. The uncertainty range (shaded area) is wider for BMW, indicating greater price variation compared to other brands.

Correlation between Selling Price, Odometer, Year of Manufacture, and Condition For Each Brands



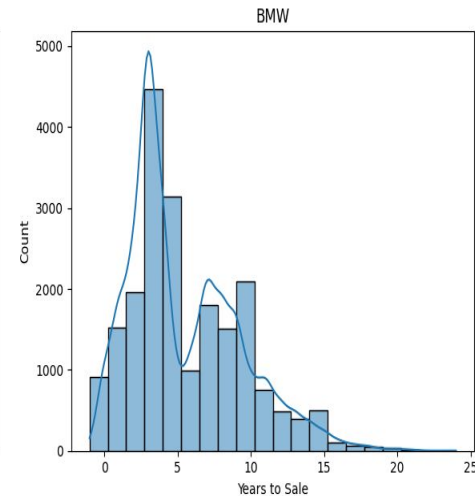
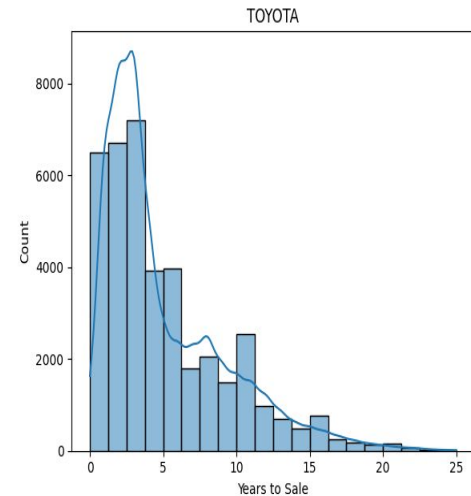
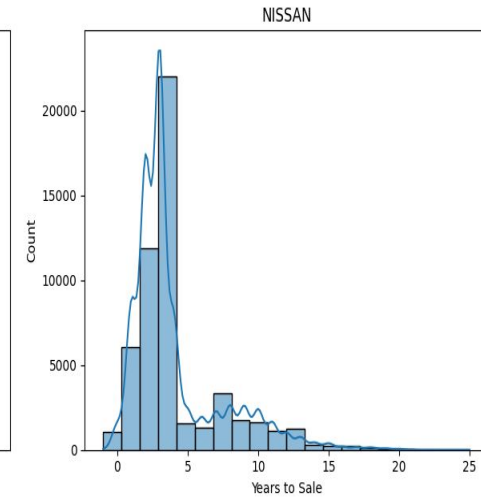
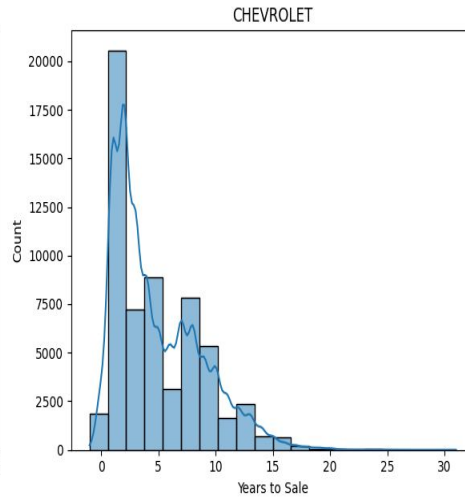
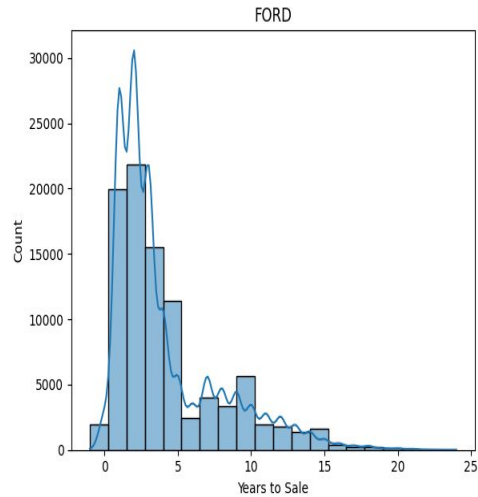
Heat Map: Correlation

Insights

- **Selling Price & Year of Manufacture:**
All brands show a positive correlation, with BMW having the highest (**0.80**), meaning newer cars tend to have higher selling prices.
- **Selling Price & Odometer:**
A negative correlation exists for all brands, with BMW being the most sensitive (**-0.74**), indicating that higher mileage significantly lowers the selling price.
- **Selling Price & Condition:**
A positive correlation is observed, with Toyota and Nissan having the strongest (**0.42**), meaning better car condition leads to higher prices, though less impactful than year and mileage.
- **Odometer & Year of Manufacture:**
Strong negative correlation for all brands, especially BMW and Toyota (**-0.81** and **-0.80**), indicating newer cars generally have lower mileage.
- **Chevrolet Shows Weaker Correlations:**
Chevrolet has weaker correlations, particularly with condition (**0.24**) and year (**0.56**), suggesting its selling prices are influenced by other factors.

Histogram: Distribution of Time Required to Sell

Time Required to Sell



Insights

Most cars from all brands are sold within the first 5 years, with a right-skewed distribution indicating a quick turnover. BMW shows a more evenly spread selling time compared to other brands, suggesting some models take longer to sell. Outliers exist in all brands, where a small number of cars take more than 10 years to be sold.

Conclusion

- Despite selling fewer vehicles, BMW has the highest average sales price, which allows it to compete with other manufacturers on overall revenue.
- Ford has the greatest maximum sales, which suggests that its top-end cars are in high demand.
- Nissan and Chevrolet continue to have significant market penetration and great sales volumes.
- Toyota's sales distribution is steady and varies just little, suggesting that market demand is balanced.
- To maintain or increase market share, each brand may improve pricing tactics, maximize inventory turnover, and capitalize on its advantages.

2014

2015

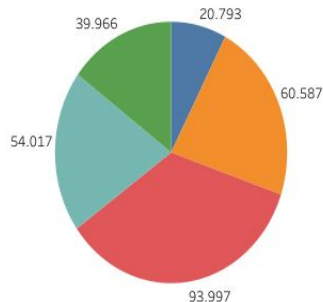
Top 5 Car Brands Sales Summary (2014-2015)

Total / Average Sales
Sum of Selling Price

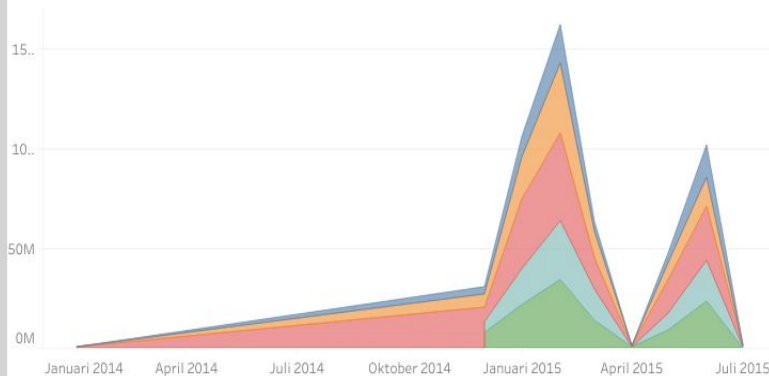
Brand

BMW
CHEVROLET
FORD
NISSAN
TOYOTA

Total Units Sold For Each Brands



Car Sales Pattern over Time



Total Sales
Chevrolet
19.049.425

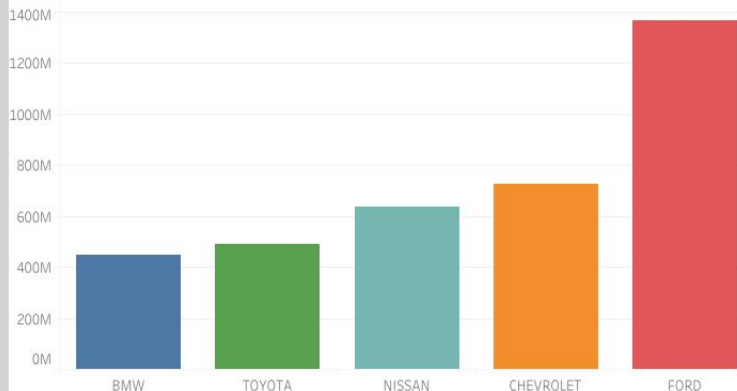
Total Sales
Ford
19.049.425

Total Sales
BMW
19.049.425

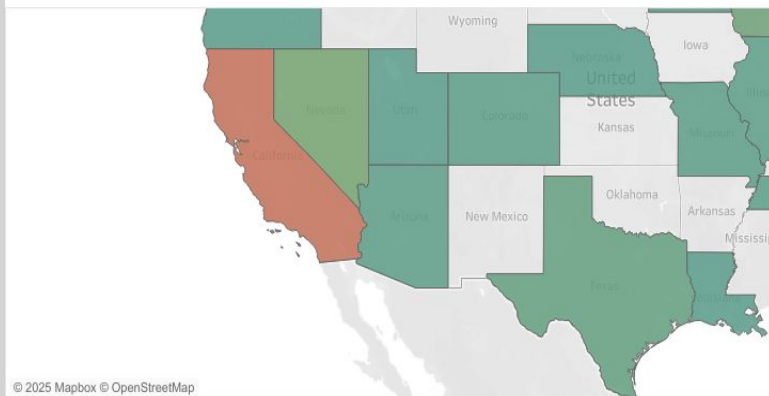
Total Sales
Nissan
19.049.425

Total Sales
Toyota
19.049.425

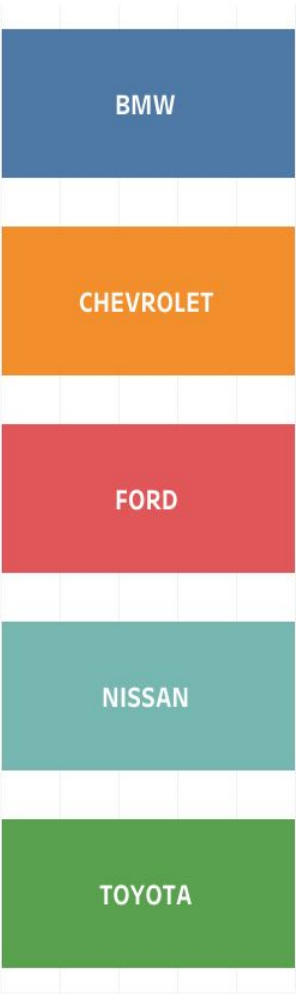
Brand Car with Most High Sales and Average Sales



States with Highest Sales



BRAND CARS



BMW

CHEVROLET

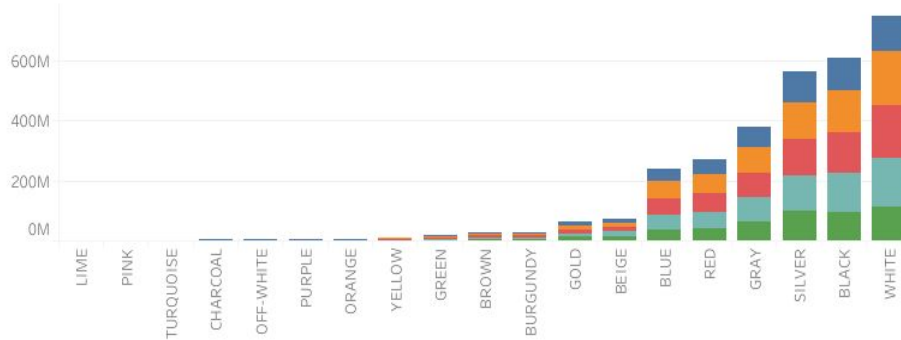
FORD

NISSAN

TOYOTA

Car Sales Breakdown: Price, Odometer, Condition, and Preferred Body & Color

Total Sales by Color



Total Sales by Body

