k.likhith

2211cs010309

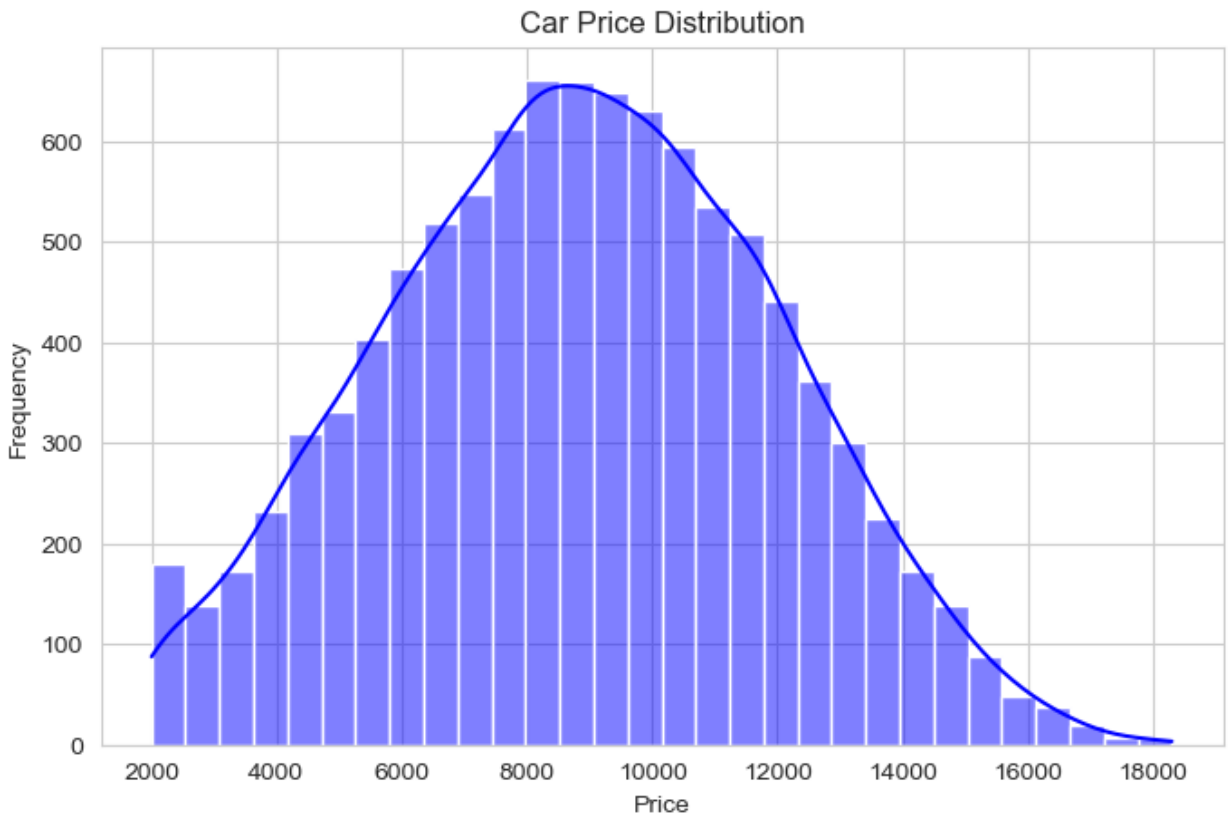
Car_price_prediction

```
# Car Price Dataset Description
# The Car Price Dataset contains information about various used cars, including their features and prices. It helps analyze factors affecting car prices, such as brand, year, mileage, fuel type, and transmission.

# Dataset Overview:
Total Entries: 10,000 (approx.)

Total Columns: 10

# Column Descriptions:
# Brand – The manufacturer of the car (e.g., Toyota, BMW, Ford).

# Model – The specific model of the car (e.g., Corolla, Mustang).

Year – The year the car was manufactured.

Engine_Size – Engine capacity in liters (e.g., 2.0L, 3.5L).

Fuel_Type – Type of fuel the car uses (Petrol, Diesel, Hybrid, Electric).

Transmission – Gear type (Manual, Automatic, Semi-Automatic).

Mileage – Distance the car has traveled (in kilometers).

Doors – Number of doors in the car.

Owner_Count – The number of previous owners.

Price – The selling price of the car (in currency)

import pandas as pd
df = pd.read_csv("car_price_dataset.csv")
df

           Brand     Model  Year  Engine_Size Fuel_Type
Transmission  \
```

```
0            Kia       Rio  2020          4.2    Diesel
Manual
1      Chevrolet    Malibu  2012          2.0    Hybrid
Automatic
2       Mercedes       GLA  2020          4.2    Diesel
Automatic
3           Audi        Q5  2023          2.0  Electric
Manual
4     Volkswagen      Golf  2003          2.6    Hybrid  Semi-
Automatic
...          ...       ...   ...          ...       ...              ..
.
9995         Kia    Optima  2004          3.7    Diesel  Semi-
Automatic
9996   Chevrolet    Impala  2002          1.4  Electric
Automatic
9997         BMW  3 Series  2010          3.0    Petrol
Automatic
9998        Ford  Explorer  2002          1.4    Hybrid
Automatic
9999  Volkswagen    Tiguan  2001          2.1    Diesel
Manual

      Mileage  Doors  Owner_Count  Price
0      289944      3            5   8501
1        5356      2            3  12092
2      231440      4            2  11171
3      160971      2            1  11780
4      286618      3            3   2867
...       ...    ...          ...    ...
9995     5794      2            4   8884
9996   168000      2            1   6240
9997    86664      5            1   9866
9998   225772      4            1   4084
9999   157882      3            3   3342

[10000 rows x 10 columns]

df.columns = df.columns.str.strip()
categorical_cols = ['Brand', 'Model', 'Fuel_Type', 'Transmission']
df_dummies = pd.get_dummies(df[categorical_cols], drop_first=True)
df_final = pd.concat([df.drop(columns=categorical_cols), df_dummies],
axis=1)
print(df_final.head())

   Year  Engine_Size  Mileage  Doors  Owner_Count  Price  Brand_BMW  \
0  2020          4.2   289944      3            5   8501      False
1  2012          2.0     5356      2            3  12092      False
2  2020          4.2   231440      4            2  11171      False
3  2023          2.0   160971      2            1  11780      False
```

```
4  2003          2.6   286618      3            3   2867      False

   Brand_Chevrolet  Brand_Ford  Brand_Honda  ...  Model_Sonata  \
0            False       False        False  ...         False
1             True       False        False  ...         False
2            False       False        False  ...         False
3            False       False        False  ...         False
4            False       False        False  ...         False

   Model_Sportage  Model_Tiguan  Model_Tucson  Model_X5
Fuel_Type_Electric  \
0           False         False         False     False
False
1           False         False         False     False
False
2           False         False         False     False
False
3           False         False         False     False
True
4           False         False         False     False
False

   Fuel_Type_Hybrid  Fuel_Type_Petrol  Transmission_Manual  \
0             False             False                 True
1              True             False                False
2             False             False                False
3             False             False                 True
4              True             False                False

   Transmission_Semi-Automatic
0                        False
1                        False
2                        False
3                        False
4                         True

[5 rows x 49 columns]
```

```python
import matplotlib.pyplot as plt
import seaborn as sns

sns.set_style("whitegrid")

plt.figure(figsize=(8, 5))
sns.histplot(df["Price"], bins=30, kde=True, color="blue")
plt.title("Car Price Distribution")
plt.xlabel("Price")
plt.ylabel("Frequency")
plt.show()
```




```
most_owned_model = df.groupby("Model")["Owner_Count"].sum().idxmax()
highest_owner_count = df.groupby("Model")["Owner_Count"].sum().max()

print(f"The car model with the highest number of users is
{most_owned_model} with {highest_owner_count} total owners.")
```

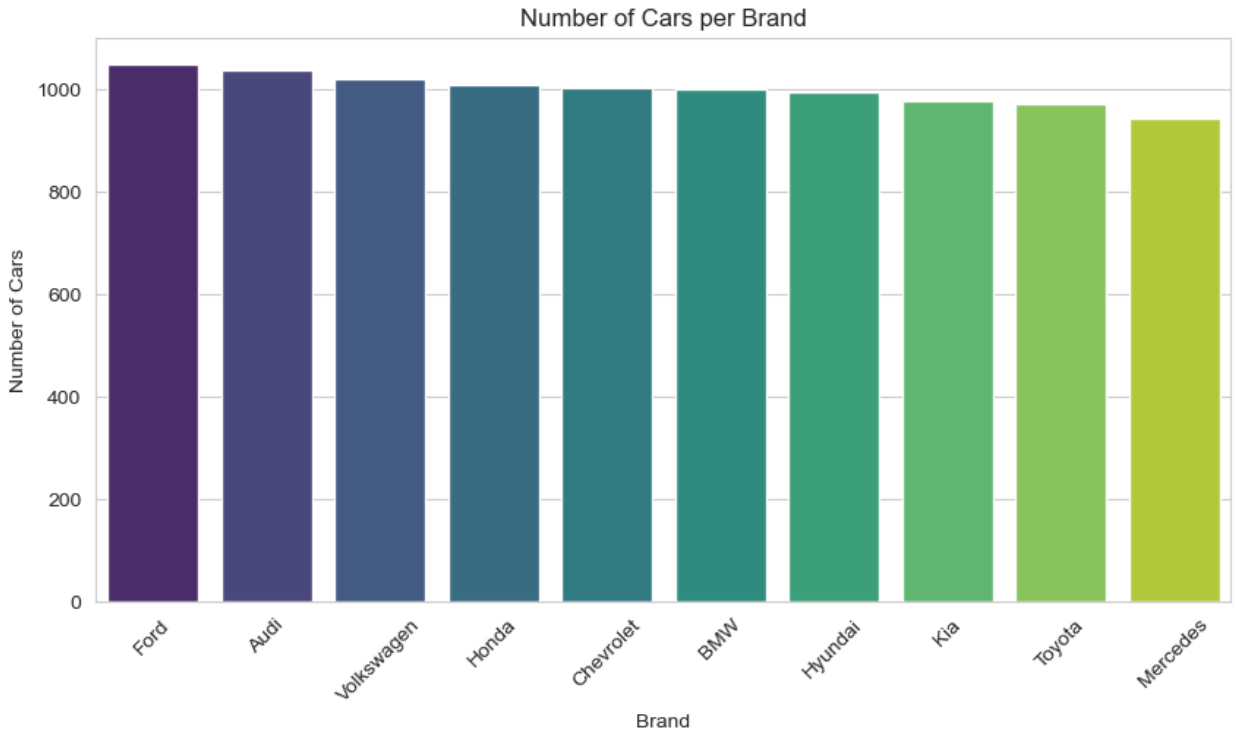
```
The car model with the highest number of users is Fiesta with 1099
total owners.
```

```
brand_counts = df['Brand'].value_counts()
brand_counts
```

```
Brand
Ford          1048
Audi          1038
Volkswagen    1020
Honda         1009
Chevrolet     1003
BMW            999
Hyundai        995
Kia            976
Toyota         970
Mercedes       942
Name: count, dtype: int64
```

```
plt.figure(figsize=(10, 5))
sns.barplot(x=brand_counts.index, y=brand_counts.values,
palette="viridis")
plt.xticks(rotation=45)
plt.xlabel("Brand")
plt.ylabel("Number of Cars")
plt.title("Number of Cars per Brand")
plt.show()
```

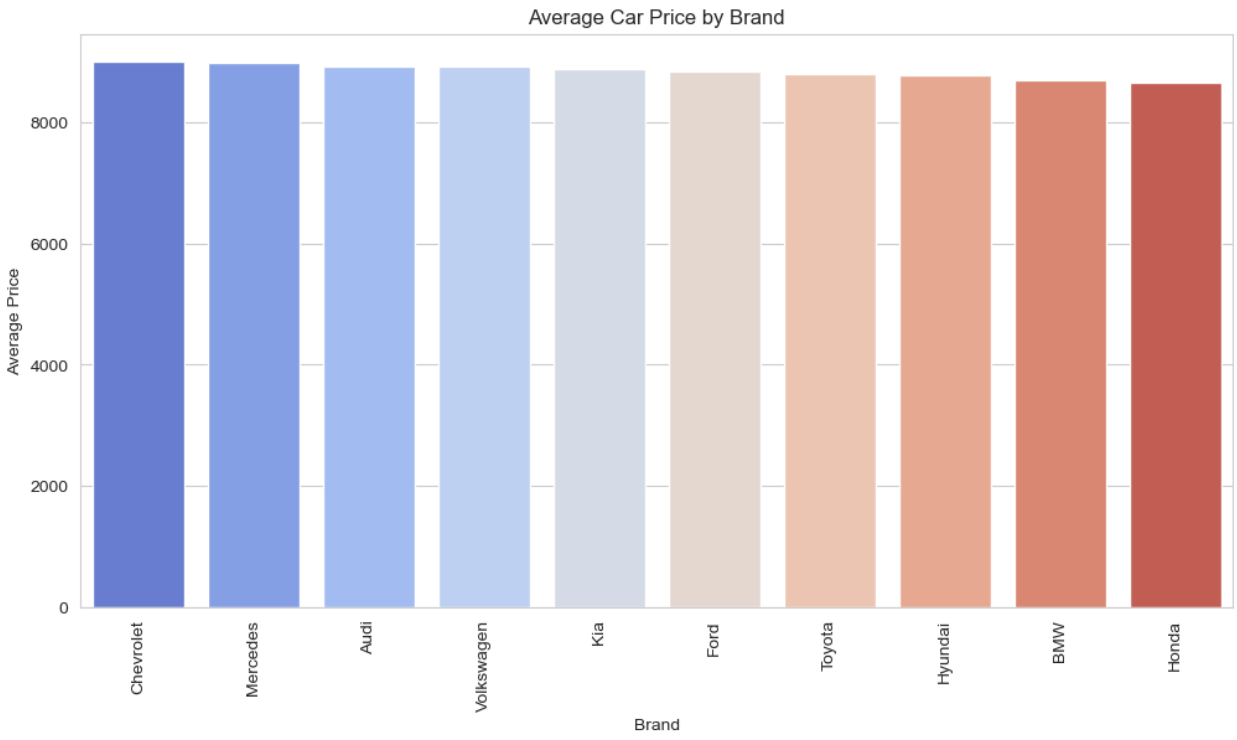
```
C:\Users\likhi\AppData\Local\Temp\ipykernel_13172\4111721367.py:2:
FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be
removed in v0.14.0. Assign the `x` variable to `hue` and set
`legend=False` for the same effect.

  sns.barplot(x=brand_counts.index, y=brand_counts.values,
palette="viridis")
```




```
import matplotlib.pyplot as plt
import seaborn as sns


sns.set_style("whitegrid")


plt.figure(figsize=(12, 6))
```

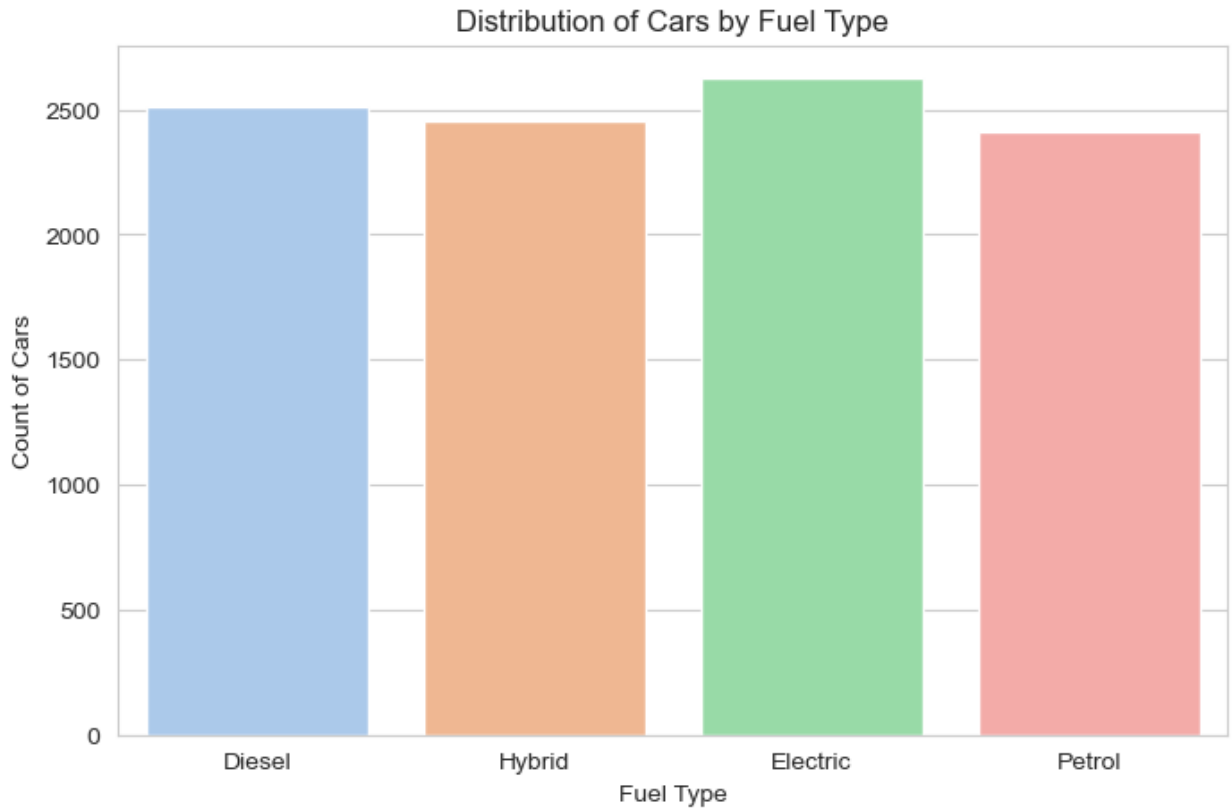
```
avg_price_by_brand = df.groupby("Brand")
['Price'].mean().sort_values(ascending=False)
sns.barplot(x=avg_price_by_brand.index, y=avg_price_by_brand.values,
palette='coolwarm')
plt.xticks(rotation=90)
plt.xlabel("Brand")
plt.ylabel("Average Price")
plt.title("Average Car Price by Brand")
plt.show()
```

```
C:\Users\likhi\AppData\Local\Temp\ipykernel_13172\207548254.py:10:
FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be
removed in v0.14.0. Assign the `x` variable to `hue` and set
`legend=False` for the same effect.

  sns.barplot(x=avg_price_by_brand.index, y=avg_price_by_brand.values,
palette='coolwarm')
```

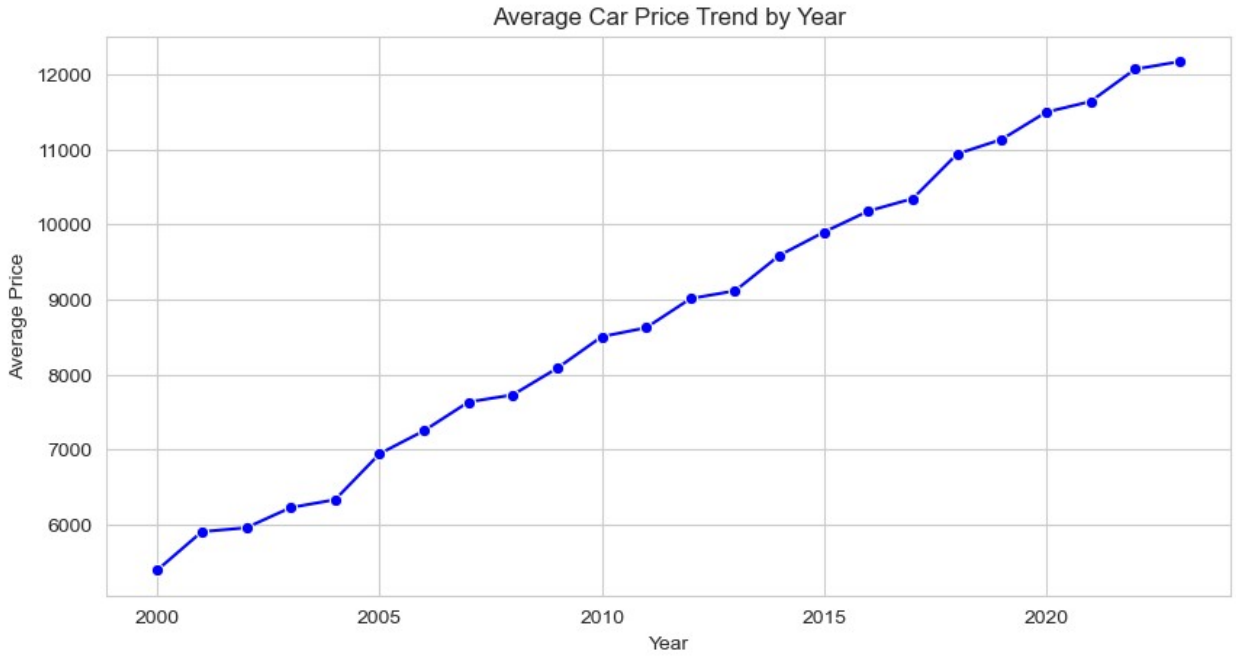



```
plt.figure(figsize=(8, 5))
sns.countplot(x=df["Fuel_Type"], palette='pastel')
plt.xlabel("Fuel Type")
plt.ylabel("Count of Cars")
plt.title("Distribution of Cars by Fuel Type")
plt.show()
```

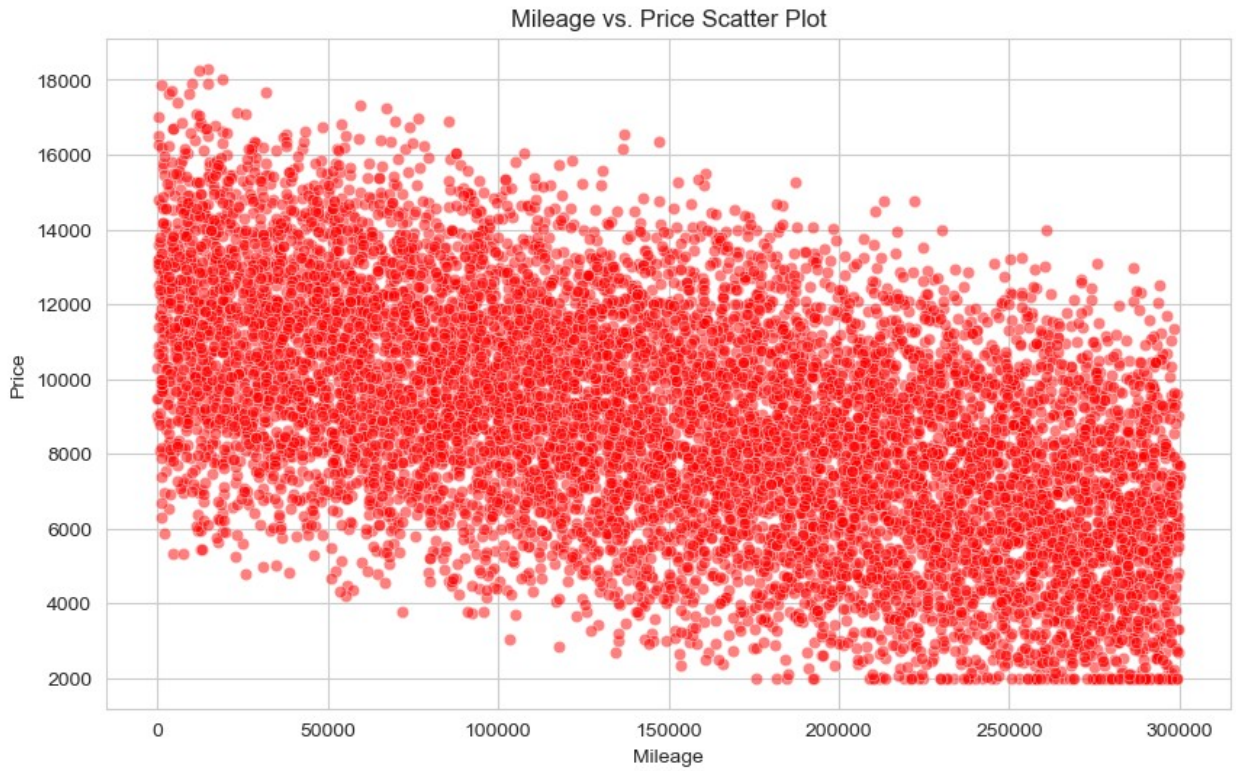
```
C:\Users\likhi\AppData\Local\Temp\ipykernel_13172\1421957402.py:2:
FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be
removed in v0.14.0. Assign the `x` variable to `hue` and set
`legend=False` for the same effect.

  sns.countplot(x=df["Fuel_Type"], palette='pastel')
```




```
plt.figure(figsize=(10, 5))
avg_price_by_year = df.groupby("Year")['Price'].mean()
sns.lineplot(x=avg_price_by_year.index, y=avg_price_by_year.values,
marker='o', color='b')
plt.xlabel("Year")
plt.ylabel("Average Price")
plt.title("Average Car Price Trend by Year")
plt.show()
```

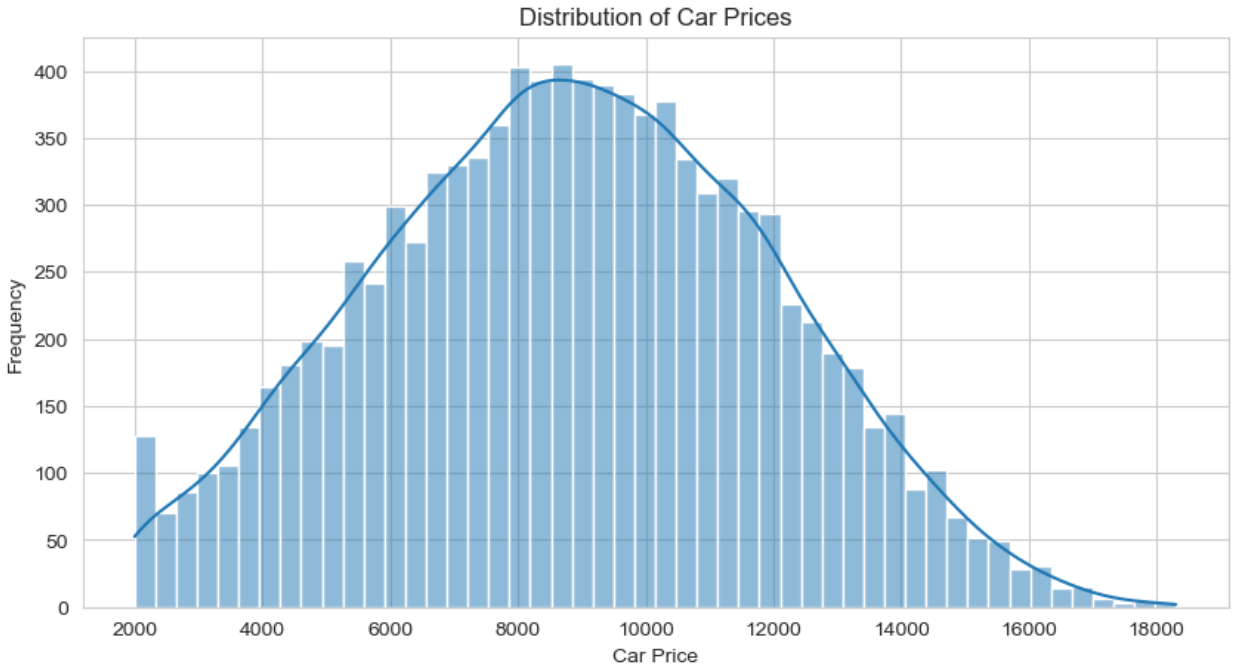



```
plt.figure(figsize=(10, 6))
sns.scatterplot(x=df['Mileage'], y=df['Price'], alpha=0.5, color='r')
plt.xlabel("Mileage")
plt.ylabel("Price")
plt.title("Mileage vs. Price Scatter Plot")
plt.show()
```

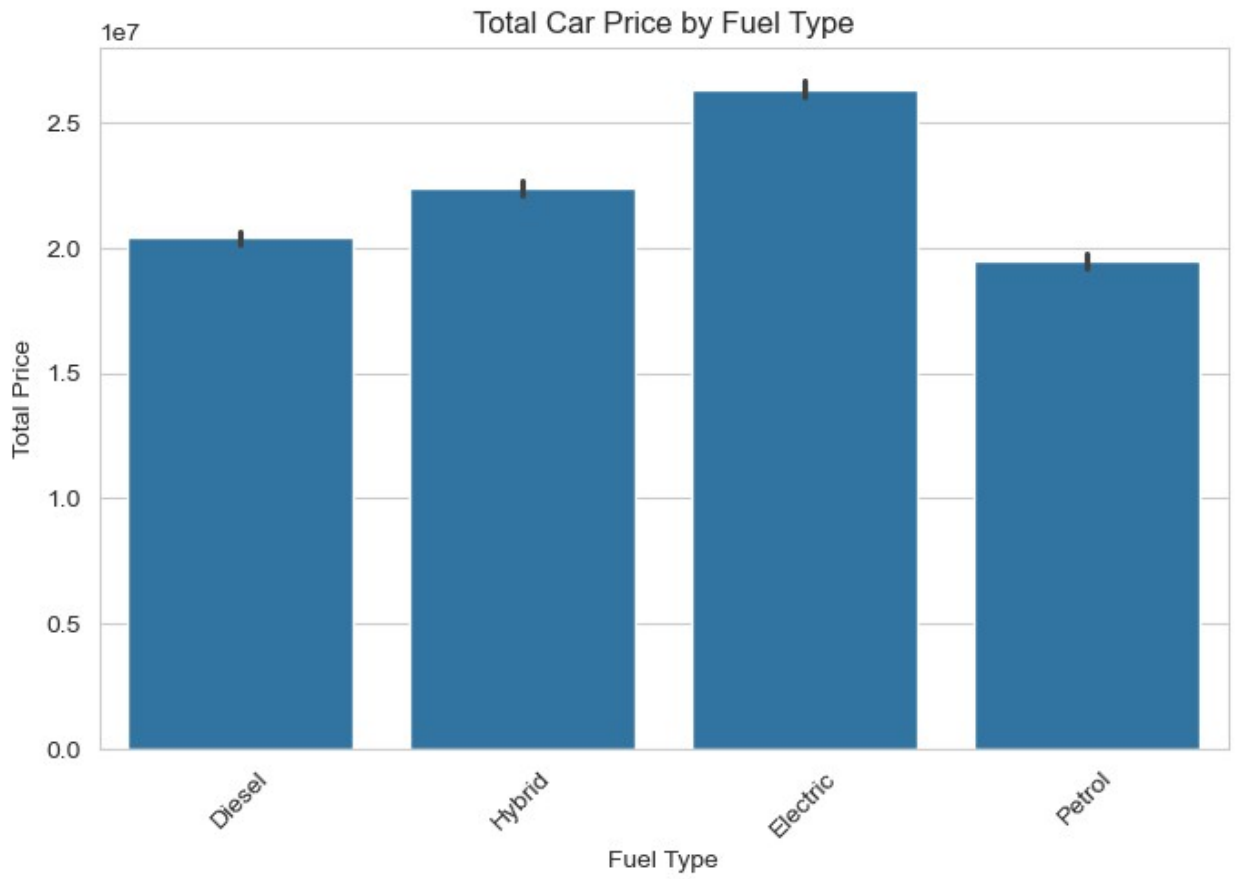


Distribution of Car Prices

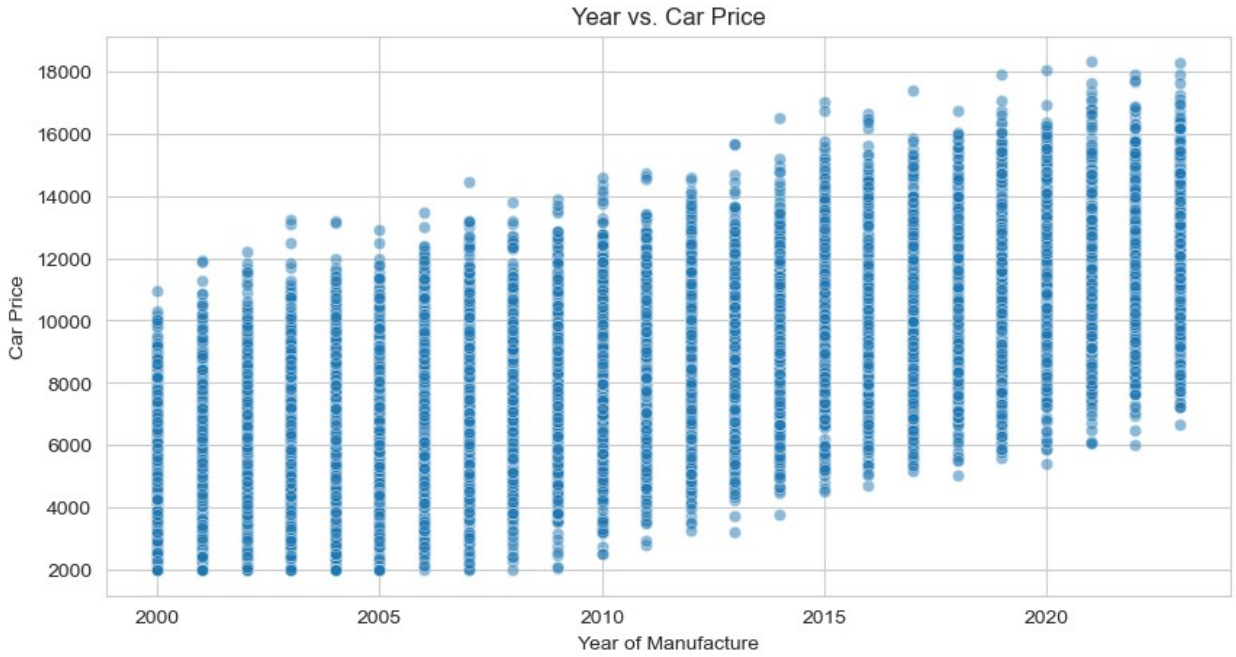
```
import pandas as pd

# Load the dataset
file_path = "car_price_dataset.csv"  # Replace with the actual file
path
df_car = pd.read_csv(file_path)

# Now run the visualization code
import matplotlib.pyplot as plt
import seaborn as sns

plt.figure(figsize=(10,5))
sns.histplot(df_car['Price'], bins=50, kde=True)
plt.xlabel("Car Price")
plt.ylabel("Frequency")
plt.title("Distribution of Car Prices")
plt.show()
```



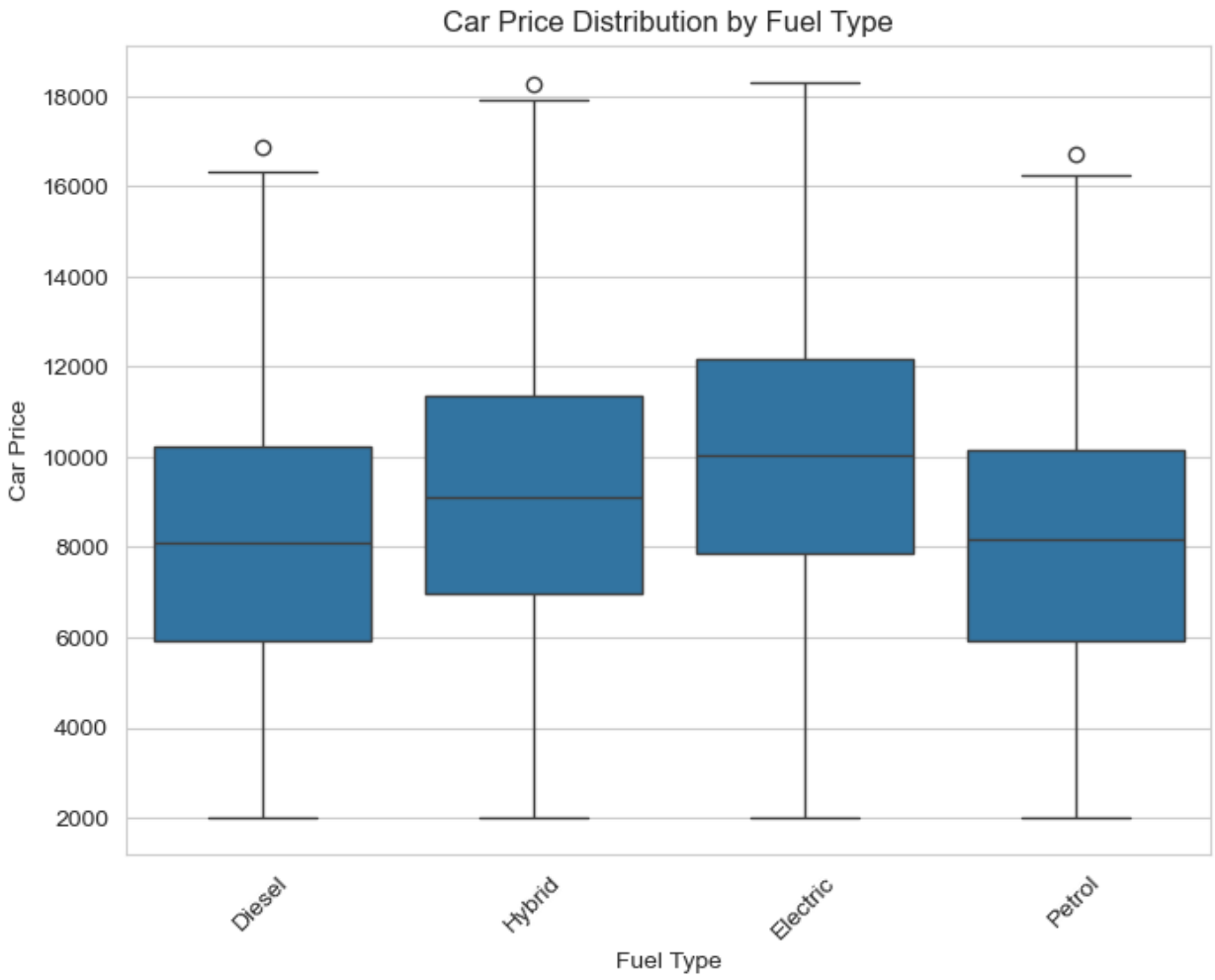

```
plt.figure(figsize=(8,5))
sns.barplot(x=df_car['Fuel_Type'], y=df_car['Price'], estimator=sum)
plt.xlabel("Fuel Type")
plt.ylabel("Total Price")
plt.title("Total Car Price by Fuel Type")
plt.xticks(rotation=45)
plt.show()
```



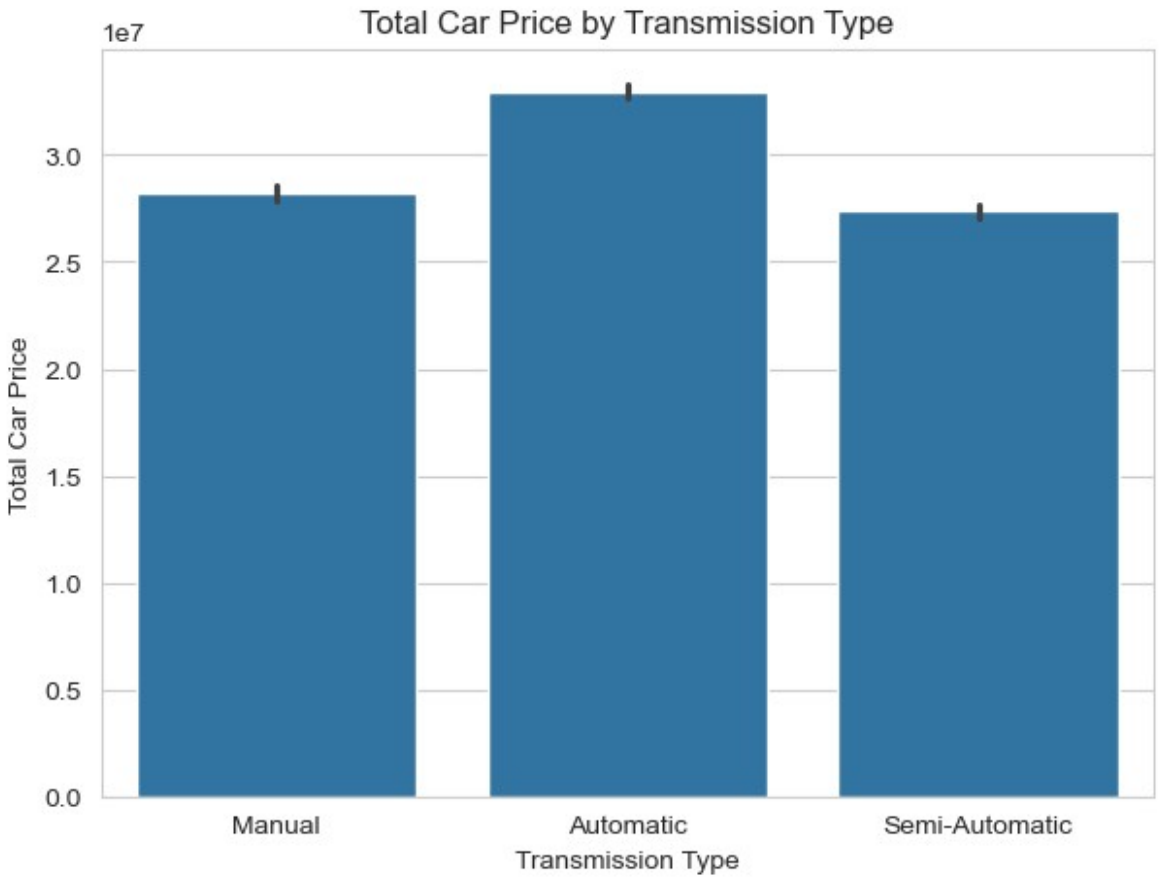

```
plt.figure(figsize=(10,5))
sns.scatterplot(x=df_car['Year'], y=df_car['Price'], alpha=0.5)
plt.xlabel("Year of Manufacture")
plt.ylabel("Car Price")
plt.title("Year vs. Car Price")
plt.show()
```



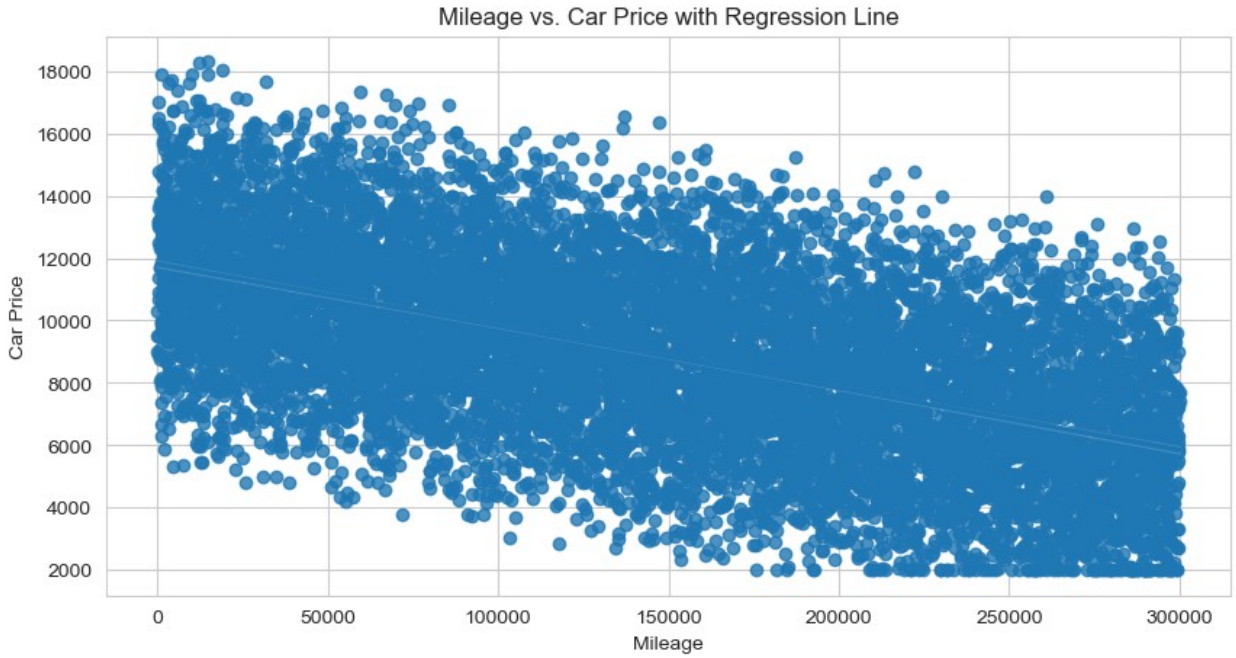

```
plt.figure(figsize=(8, 6))
sns.boxplot(x=df_car['Fuel_Type'], y=df_car['Price'])
plt.xlabel("Fuel Type")
plt.ylabel("Car Price")
plt.title("Car Price Distribution by Fuel Type")
plt.xticks(rotation=45)
plt.show()
```



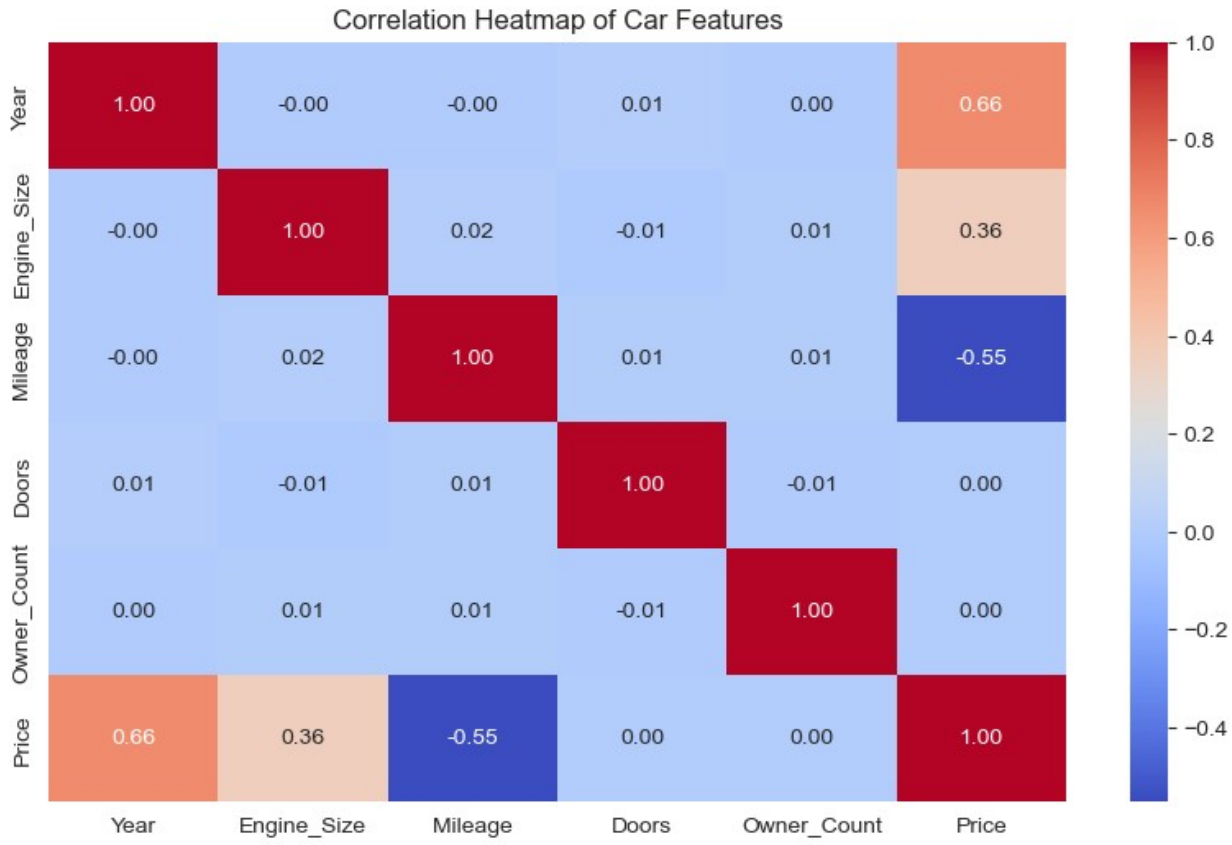

```
plt.figure(figsize=(7, 5))
sns.barplot(x=df_car['Transmission'], y=df_car['Price'],
estimator=sum)
plt.xlabel("Transmission Type")
plt.ylabel("Total Car Price")
plt.title("Total Car Price by Transmission Type")
plt.show()
```



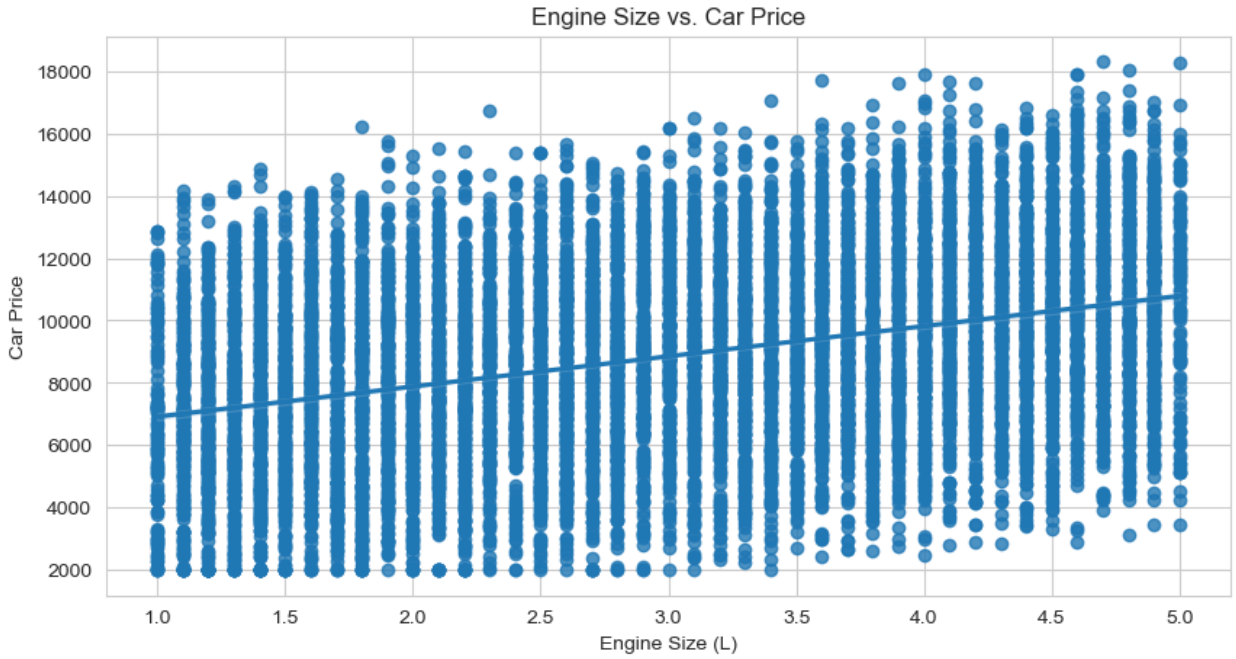

```
plt.figure(figsize=(10,5))
sns.regplot(x=df_car['Mileage'], y=df_car['Price'])
plt.xlabel("Mileage")
plt.ylabel("Car Price")
plt.title("Mileage vs. Car Price with Regression Line")
plt.show()
```



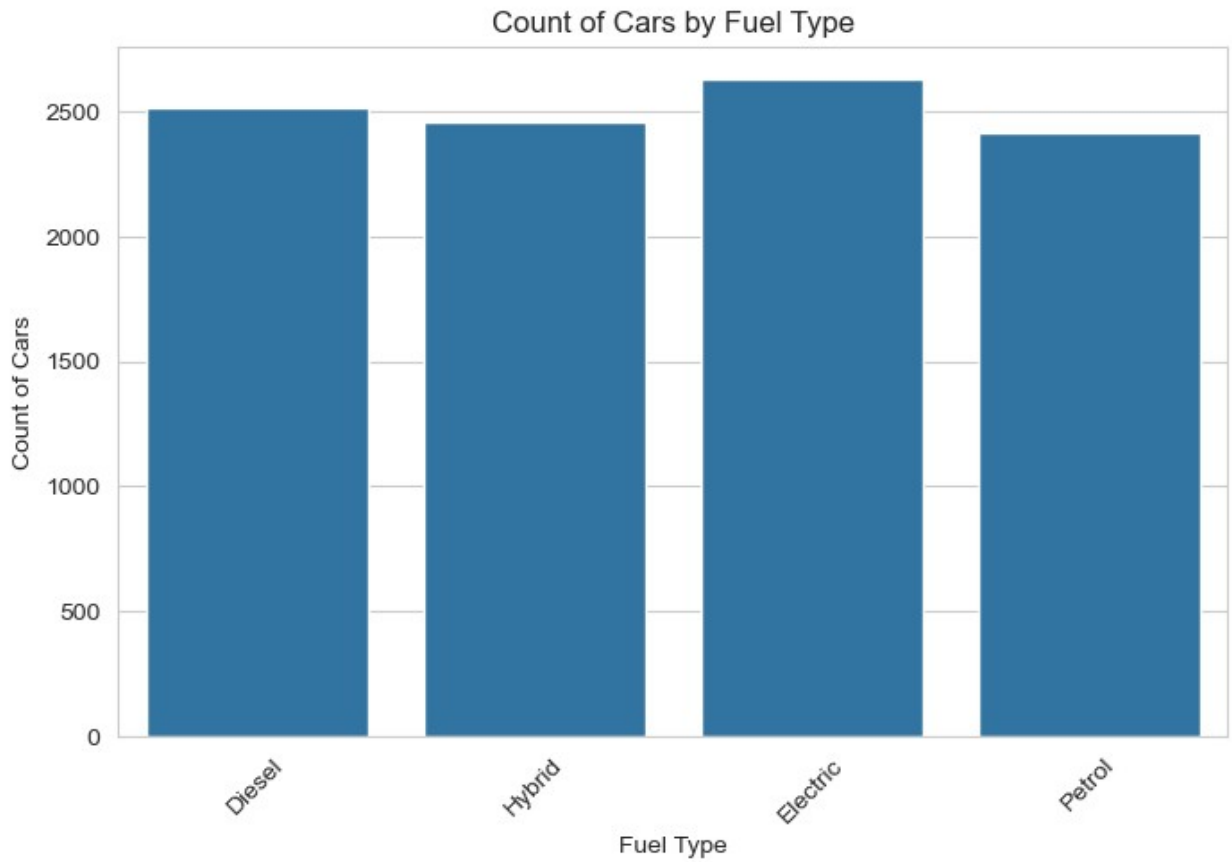

```
import numpy as np

plt.figure(figsize=(10, 6))
corr = df_car.corr(numeric_only=True)  # Ensure only numerical columns
sns.heatmap(corr, annot=True, cmap="coolwarm", fmt=".2f")
plt.title("Correlation Heatmap of Car Features")
plt.show()
```



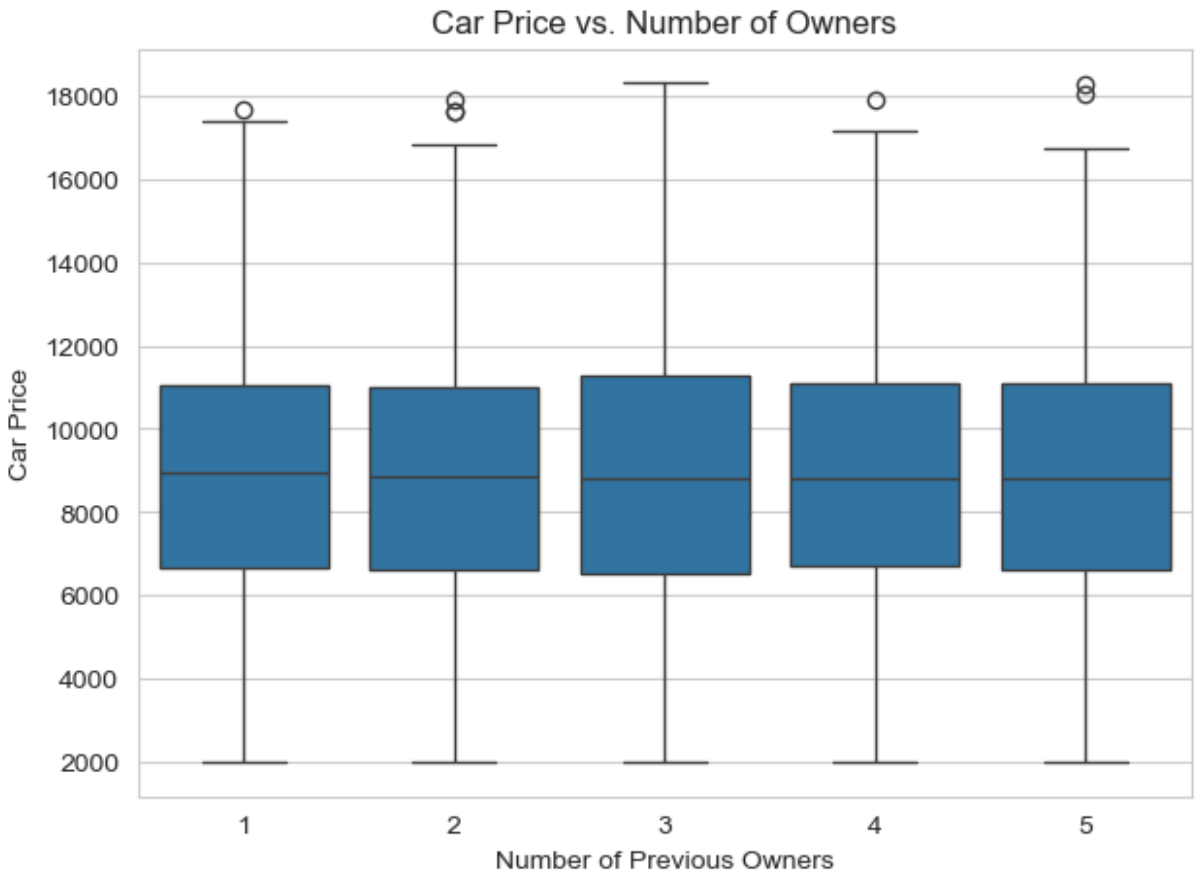

```
plt.figure(figsize=(10, 5))
sns.regplot(x=df_car['Engine_Size'], y=df_car['Price'])
plt.xlabel("Engine Size (L)")
plt.ylabel("Car Price")
plt.title("Engine Size vs. Car Price")
plt.show()
```




```
plt.figure(figsize=(8, 5))
sns.countplot(x=df_car['Fuel_Type'])
plt.xlabel("Fuel Type")
plt.ylabel("Count of Cars")
plt.title("Count of Cars by Fuel Type")
plt.xticks(rotation=45)
plt.show()
```




```
plt.figure(figsize=(7, 5))
sns.boxplot(x=df_car['Owner_Count'], y=df_car['Price'])
plt.xlabel("Number of Previous Owners")
plt.ylabel("Car Price")
plt.title("Car Price vs. Number of Owners")
plt.show()
```


Car Price vs. Number of Owners
Car Price
18000
16000
14000
12000
10000
8000
6000
4000
2000
1
2
3
4
5
Number of Previous Owners