```
#import required libraries
import pandas as pd
import matplotlib.pyplot as plt
%matplotlib inline
import seaborn as sns
from sklearn.model_selection import train_test_split
from sklearn.preprocessing import StandardScaler
from sklearn.linear_model import LinearRegression
from sklearn import metrics
```

```
#loading the data from csv to pandas data frame
car_data = pd.read_csv('/content/car data.csv')
```

```
#printing the first five rows from the data set
car_data.head()
```

	Car_Name	Year	Selling_Price	Present_Price	Kms_Driven	Fuel_Type	Seller_Type	Transmission	Owner
0	ritz	2014	3.35	5.59	27000	Petrol	Dealer	Manual	0
1	sx4	2013	4.75	9.54	43000	Diesel	Dealer	Manual	0
2	ciaz	2017	7.25	9.85	6900	Petrol	Dealer	Manual	0
3	wagon r	2011	2.85	4.15	5200	Petrol	Dealer	Manual	0
4	swift	2014	4.60	6.87	42450	Diesel	Dealer	Manual	0

```
#printing the last five rows from the data set
car_data.tail()
```

	Car_Name	Year	Selling_Price	Present_Price	Kms_Driven	Fuel_Type	Seller_Type	Transmission	Owner
296	city	2016	9.50	11.6	33988	Diesel	Dealer	Manual	0
297	brio	2015	4.00	5.9	60000	Petrol	Dealer	Manual	0
298	city	2009	3.35	11.0	87934	Petrol	Dealer	Manual	0
299	city	2017	11.50	12.5	9000	Diesel	Dealer	Manual	0

```
#Knowing basic information from the given data set
car_data.describe()
```

	Year	Selling_Price	Present_Price	Kms_Driven	Owner
count	301.000000	301.000000	301.000000	301.000000	301.000000
mean	2013.627907	4.661296	7.628472	36947.205980	0.043189
std	2.891554	5.082812	8.644115	38886.883882	0.247915
min	2003.000000	0.100000	0.320000	500.000000	0.000000
25%	2012.000000	0.900000	1.200000	15000.000000	0.000000
50%	2014.000000	3.600000	6.400000	32000.000000	0.000000
75%	2016.000000	6.000000	9.900000	48767.000000	0.000000
max	2018.000000	35.000000	92.600000	500000.000000	3.000000

```
car_data.shape
```

```
(301, 9)
```

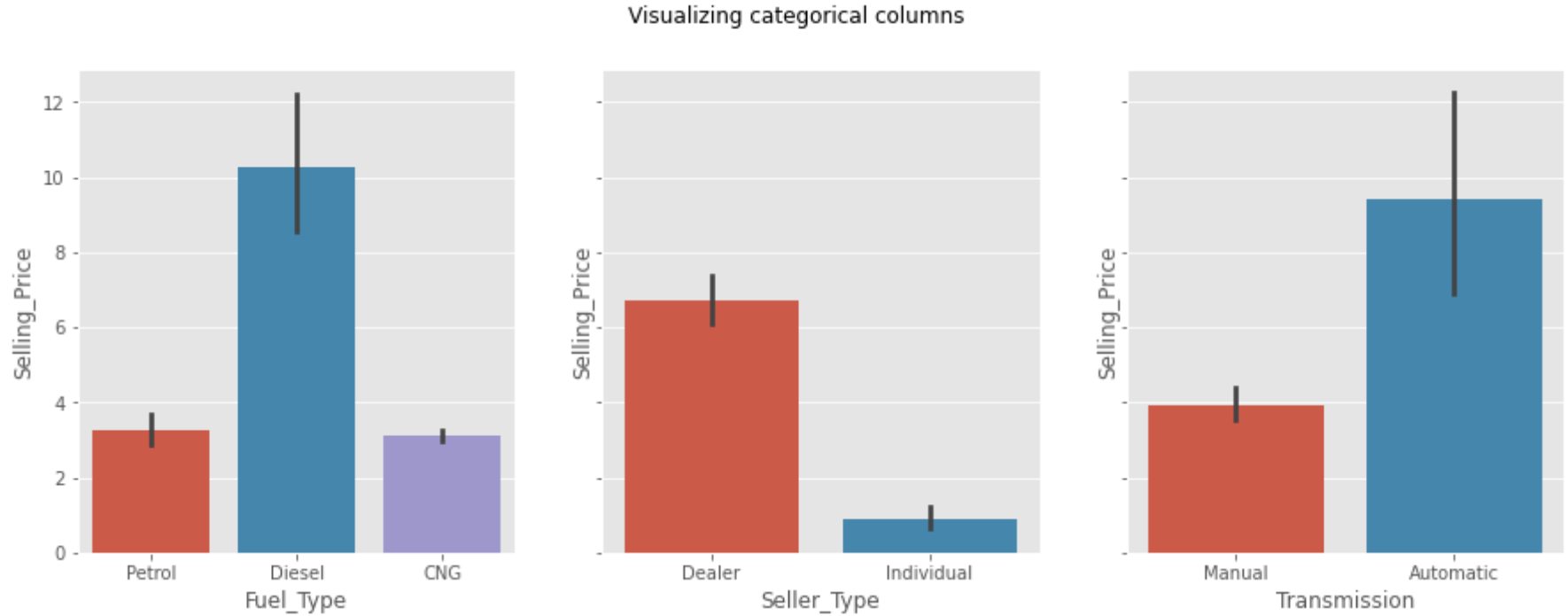
```
fuel_type = car_data['Fuel_Type']
seller_type = car_data['Seller_Type']
transmission_type = car_data['Transmission']
selling_price = car_data['Selling_Price']
```

```
from matplotlib import style


#Showing the bar graph initialization
style.use('ggplot')
fig = plt.figure(figsize=(15,5))
fig.suptitle('Visualizing categorical data columns')
plt.subplot(1,3,1)
plt.bar(fuel_type,selling_price, color='royalblue')
plt.xlabel("Fuel Type")
plt.ylabel("Selling Price")
plt.subplot(1,3,2)
plt.bar(seller_type, selling_price, color='red')
plt.xlabel("Seller Type")
plt.subplot(1,3,3)
plt.bar(transmission_type, selling_price, color='purple')
plt.xlabel('Transmission type')
plt.show()
```

Visualizing categorical data columns

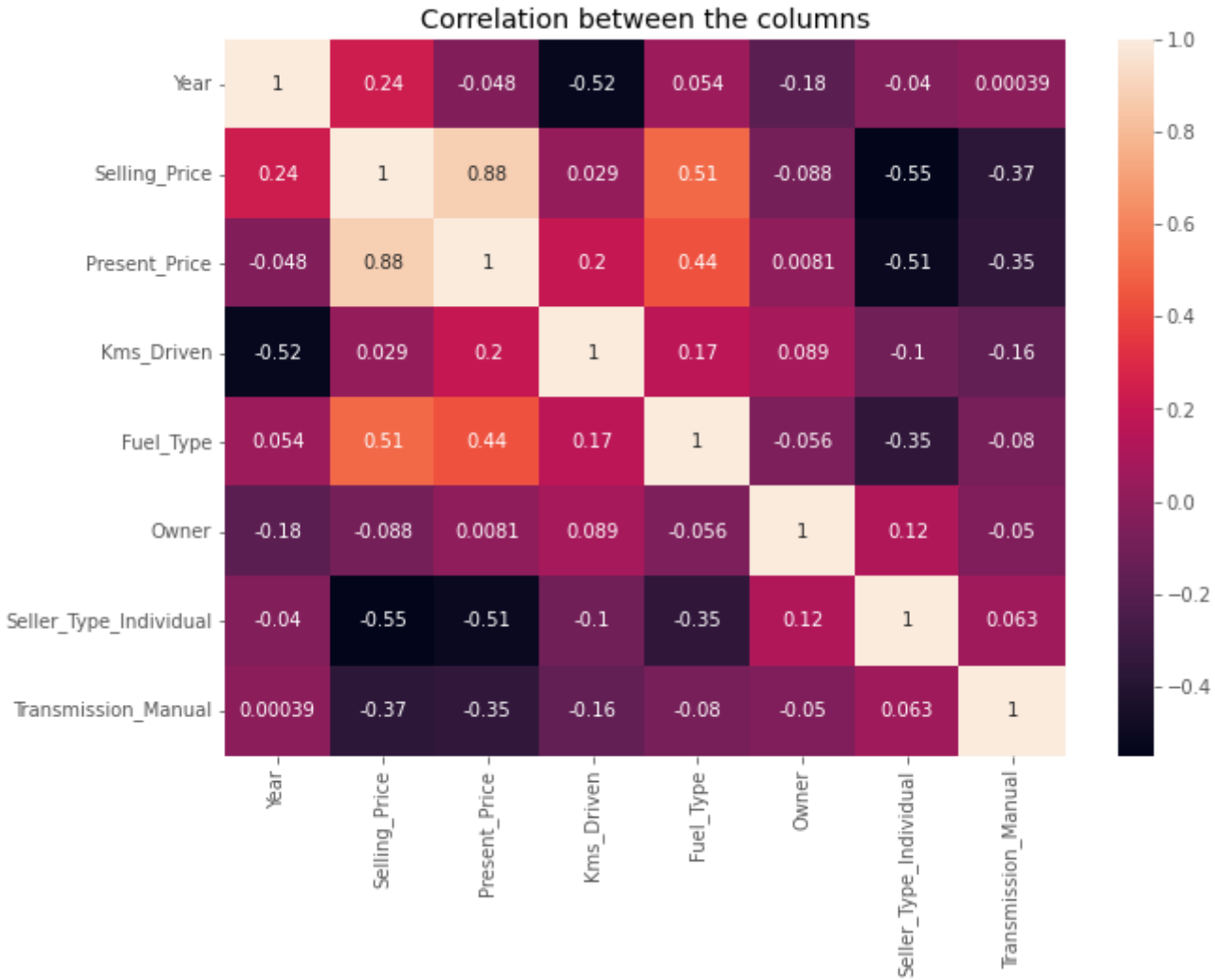
```
fig, axes = plt.subplots(1,3,figsize=(15,5), sharey=True)
fig.suptitle('Visualizing categorical columns')
sns.barplot(x=fuel_type, y=selling_price, ax=axes[0])
sns.barplot(x=seller_type, y=selling_price, ax=axes[1])
sns.barplot(x=transmission_type, y=selling_price, ax=axes[2])
```

```
<matplotlib.axes._subplots.AxesSubplot at 0x7f60de56edd0>
```




```
plt.figure(figsize=(10,7))
sns.heatmap(car_data.corr(), annot=True)
```

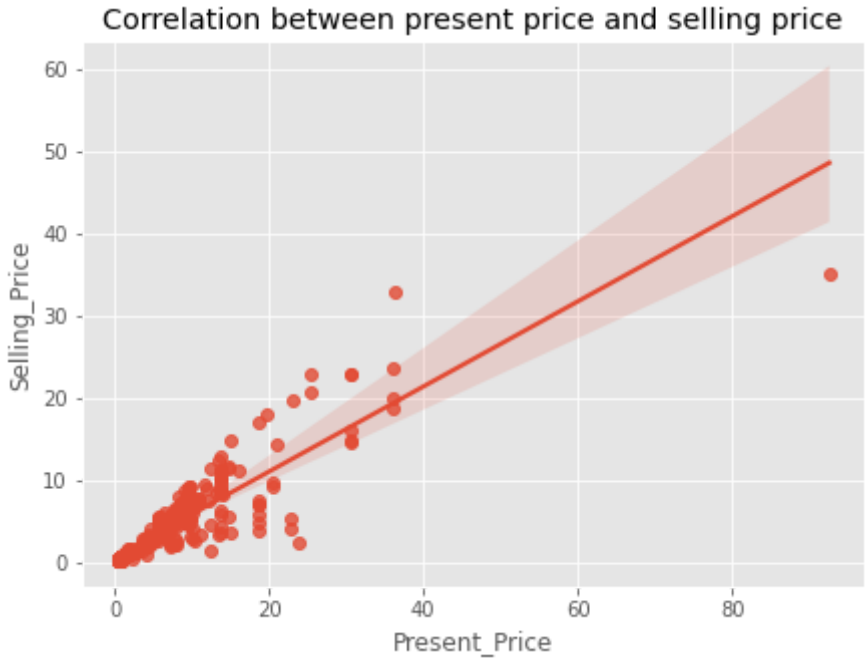
```
plt.title('Correlation between the columns')
plt.show()
```




```
fig=plt.figure(figsize=(7,5))
plt.title('Correlation between present price and selling price')
sns.regplot(x='Present_Price', y='Selling_Price', data=car_data)

X = car_data.drop(['Car_Name','Selling_Price'], axis=1)
```

```
y = car_data['Selling_Price']

print("Shape of X is: ",X.shape)
print("Shape of y is: ", y.shape)
```

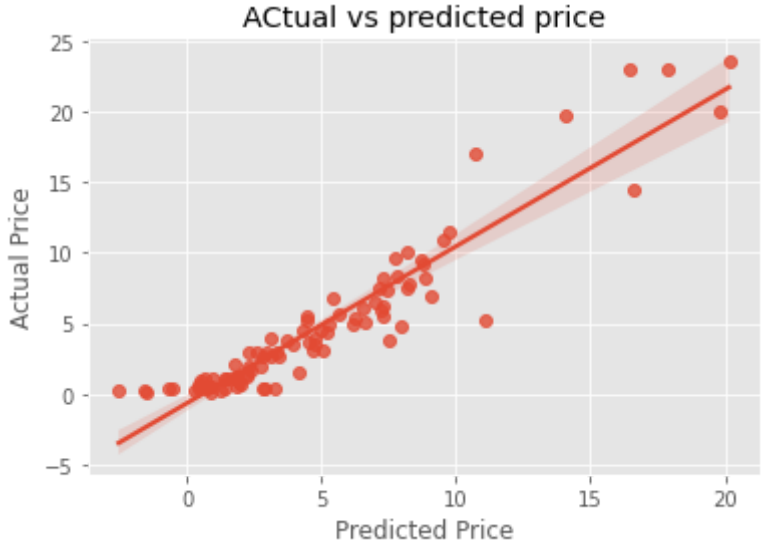
```
Shape of X is:  (301, 7)
Shape of y is:  (301,)
```




```
X_train, X_test, y_train, y_test = train_test_split(X,y, test_size=0.3, random_state=42)

print("X_test shape:", X_test.shape)
print("X_train shape:", X_train.shape)
print("y_test shape: ", y_test.shape)
print("y_train shape:", y_train.shape)

scaler = StandardScaler()

X_train = scaler.fit_transform(X_train)
X_test = scaler.transform(X_test)
```

```
model = LinearRegression()

model.fit(X_train, y_train)

pred = model.predict(X_test)

from sklearn.metrics import mean_absolute_error, mean_squared_error, r2_score

print("MAE: ", (metrics.mean_absolute_error(pred, y_test)))
print("MSE: ", (metrics.mean_squared_error(pred, y_test)))
print("R2 score: ", (metrics.r2_score(pred, y_test)))

sns.regplot(x=pred, y=y_test)
plt.xlabel("Predicted Price")
plt.ylabel('Actual Price')
plt.title("ACtual vs predicted price")
plt.show()
```

```
X_test shape: (91, 7)
X_train shape: (210, 7)
y_test shape:  (91,)


MSE:  3.493286026225147
R2 score:  0.8294933369778817
```



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