

In [1]:

```
import pandas as pd
import numpy as np
from sklearn import preprocessing
import matplotlib.pyplot as plt
import seaborn as sns
sns.set(style="white")
sns.set(style="whitegrid", color_codes=True)
import warnings
warnings.simplefilter(action='ignore')
```

In [5]:

```
df=pd.read_csv(r"C:\Users\Svijayalakshmi\Downloads\used_cars_data.csv")
df
```

Out[5]:

	S.No.	Name	Location	Year	Kilometers_Driven	Fuel_Type	Transmission	Owr
0	0	Maruti Wagon R LXI CNG	Mumbai	2010	72000	CNG	Manual	
1	1	Hyundai Creta 1.6 CRDi SX Option	Pune	2015	41000	Diesel	Manual	
2	2	Honda Jazz V	Chennai	2011	46000	Petrol	Manual	
3	3	Maruti Ertiga VDI	Chennai	2012	87000	Diesel	Manual	
4	4	Audi A4 New 2.0 TDI Multitronic	Coimbatore	2013	40670	Diesel	Automatic	
...	
7248	7248	Volkswagen Vento Diesel Trendline	Hyderabad	2011	89411	Diesel	Manual	
7249	7249	Volkswagen Polo GT TSI	Mumbai	2015	59000	Petrol	Automatic	
7250	7250	Nissan Micra Diesel XV	Kolkata	2012	28000	Diesel	Manual	
7251	7251	Volkswagen Polo GT TSI	Pune	2013	52262	Petrol	Automatic	
7252	7252	Mercedes-Benz E-Class 2009-2013 E 220 CDI Avan...	Kochi	2014	72443	Diesel	Automatic	

7253 rows × 14 columns



In [6]:

```
df.head()
```

Out[6]:

	S.No.	Name	Location	Year	Kilometers_Driven	Fuel_Type	Transmission	Owner_Type
0	0	Maruti Wagon R LXI CNG	Mumbai	2010	72000	CNG	Manual	F
1	1	Hyundai Creta 1.6 CRDi SX Option	Pune	2015	41000	Diesel	Manual	F
2	2	Honda Jazz V	Chennai	2011	46000	Petrol	Manual	F
3	3	Maruti Ertiga VDI	Chennai	2012	87000	Diesel	Manual	F
4	4	Audi A4 New 2.0 TDI Multitronic	Coimbatore	2013	40670	Diesel	Automatic	Sec

In [7]:

```
df.tail()
```

Out[7]:

	S.No.	Name	Location	Year	Kilometers_Driven	Fuel_Type	Transmission	Owner_Type
7248	7248	Volkswagen Vento Diesel Trendline	Hyderabad	2011	89411	Diesel	Manual	F
7249	7249	Volkswagen Polo GT TSI	Mumbai	2015	59000	Petrol	Automatic	F
7250	7250	Nissan Micra Diesel XV	Kolkata	2012	28000	Diesel	Manual	F
7251	7251	Volkswagen Polo GT TSI	Pune	2013	52262	Petrol	Automatic	F
7252	7252	Mercedes-Benz E-Class 2009-2013 E 220 CDI Avantgarde	Kochi	2014	72443	Diesel	Automatic	F

In [9]:

```
df.shape
```

Out[9]:

(7253, 14)

In [11]:

```
df.describe()
```

Out[11]:

	S.No.	Year	Kilometers_Driven	Seats	Price
count	7253.000000	7253.000000	7.253000e+03	7200.000000	6019.000000
mean	3626.000000	2013.365366	5.869906e+04	5.279722	9.479468
std	2093.905084	3.254421	8.442772e+04	0.811660	11.187917
min	0.000000	1996.000000	1.710000e+02	0.000000	0.440000
25%	1813.000000	2011.000000	3.400000e+04	5.000000	3.500000
50%	3626.000000	2014.000000	5.341600e+04	5.000000	5.640000
75%	5439.000000	2016.000000	7.300000e+04	5.000000	9.950000
max	7252.000000	2019.000000	6.500000e+06	10.000000	160.000000

In [13]:

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 7253 entries, 0 to 7252
Data columns (total 14 columns):
#   Column                Non-Null Count  Dtype
---  -
0   S.No.                  7253 non-null   int64
1   Name                   7253 non-null   object
2   Location               7253 non-null   object
3   Year                   7253 non-null   int64
4   Kilometers_Driven      7253 non-null   int64
5   Fuel_Type              7253 non-null   object
6   Transmission           7253 non-null   object
7   Owner_Type             7253 non-null   object
8   Mileage                7251 non-null   object
9   Engine                 7207 non-null   object
10  Power                  7207 non-null   object
11  Seats                  7200 non-null   float64
12  New_Price              1006 non-null   object
13  Price                  6019 non-null   float64
dtypes: float64(2), int64(3), object(9)
memory usage: 793.4+ KB
```

In [14]:

```
df.isnull().sum()
```

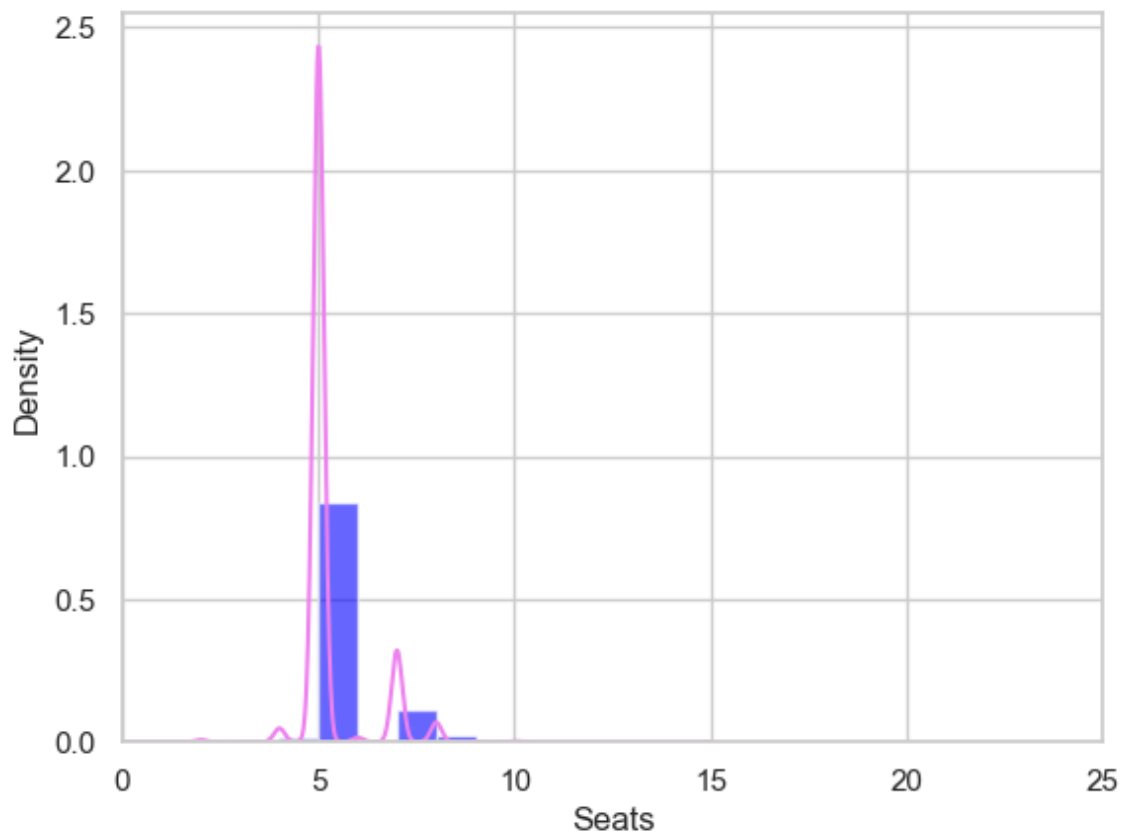
Out[14]:

S.No.	0
Name	0
Location	0
Year	0
Kilometers_Driven	0
Fuel_Type	0
Transmission	0
Owner_Type	0
Mileage	2
Engine	46
Power	46
Seats	53
New_Price	6247
Price	1234

dtype: int64

In [15]:

```
ax=df["Seats"].hist(bins=10,density=True,stacked=True,color='blue',alpha=0.6)
df["Seats"].plot(kind='density',color='violet')
ax.set(xlabel='Seats')
plt.xlim(-0,25)
plt.show()
```



In [16]:

```
print(df["Seats"].mean(skipna=True))  
print(df["Seats"].median(skipna=True))
```

5.279722222222222

5.0

In [17]:

```
print(df["New_Price"].isnull().sum()/df.shape[0])  
print(df["Price"].isnull().sum()/df.shape[0])  
print(df["Mileage"].isnull().sum()/df.shape[0])  
print(df["Engine"].isnull().sum()/df.shape[0])  
print(df["Power"].isnull().sum()/df.shape[0])
```

0.8612987729215497

0.1701364952433476

0.0002757479663587481

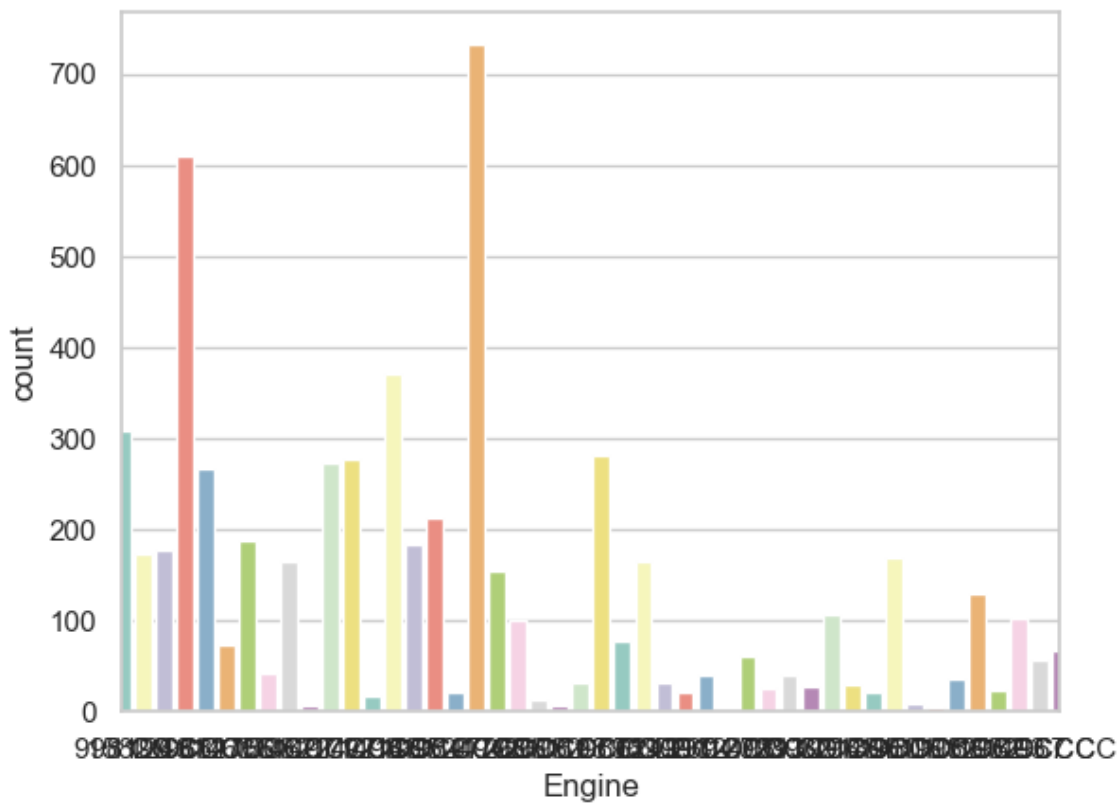
0.006342203226251206

0.006342203226251206

In [19]:

```
print(df['Engine'].value_counts())
sns.countplot(x='Engine',data=df,palette='Set3')
plt.xlim(-0,45)
plt.show()
```

```
Engine
1197 CC    732
1248 CC    610
1498 CC    370
998 CC     309
1198 CC    281
...
1489 CC     1
1422 CC     1
2706 CC     1
1978 CC     1
1389 CC     1
Name: count, Length: 150, dtype: int64
```



In [20]:

```
data=df.copy()
data['Seats'].fillna(df['Seats'].median(skipna=True),inplace=True)
data.drop('New_Price',axis=1,inplace=True)
data['Price'].fillna(df['Price'].median(skipna=True),inplace=True)
data['Mileage'].fillna(df['Mileage'].value_counts().idxmax(),inplace=True)
data.drop('Engine',axis=1,inplace=True)
data.drop('Power',axis=1,inplace=True)
```

In [21]:

```
data.isnull().sum()
```

Out[21]:

```
S.No.      0
Name       0
Location   0
Year       0
Kilometers_Driven  0
Fuel_Type  0
Transmission  0
Owner_Type  0
Mileage    0
Seats      0
Price      0
dtype: int64
```

In [22]:

```
df.head()
```

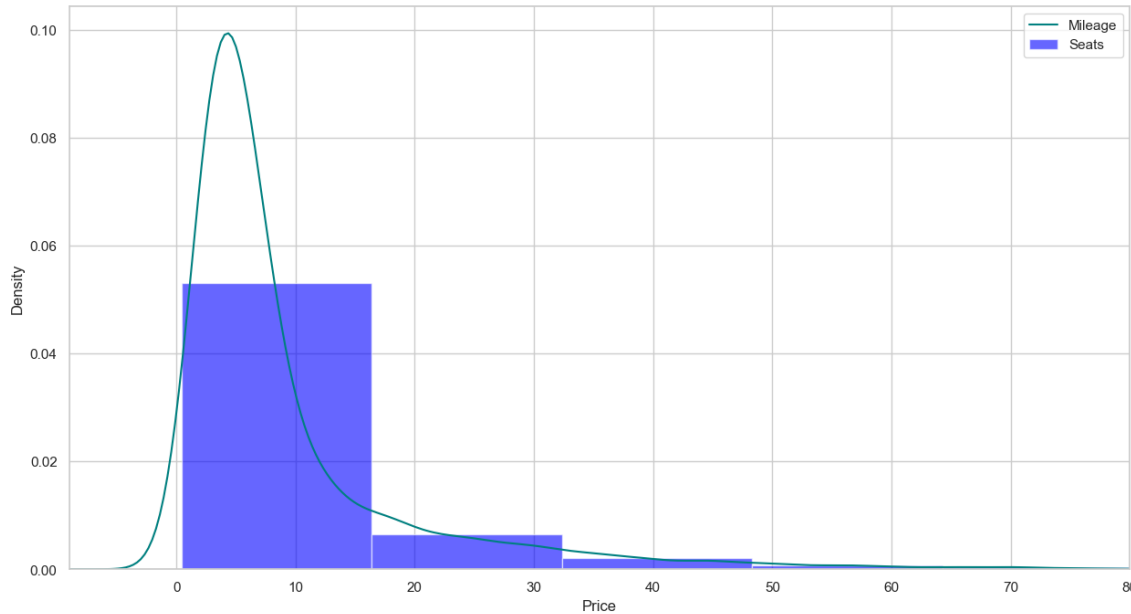
Out[22]:

	S.No.	Name	Location	Year	Kilometers_Driven	Fuel_Type	Transmission	Owner_Type
0	0	Maruti Wagon R LXI CNG	Mumbai	2010	72000	CNG	Manual	F
1	1	Hyundai Creta 1.6 CRDi SX Option	Pune	2015	41000	Diesel	Manual	F
2	2	Honda Jazz V	Chennai	2011	46000	Petrol	Manual	F
3	3	Maruti Ertiga VDI	Chennai	2012	87000	Diesel	Manual	F
4	4	Audi A4 New 2.0 TDI Multitronic	Coimbatore	2013	40670	Diesel	Automatic	Sec



In [23]:

```
plt.figure(figsize=(15,8))
ax=df["Price"].hist(bins=10,density=True,stacked=True,color='blue',alpha=0.6)
df["Price"].plot(kind='density',color='teal')
ax.legend(['Mileage','Seats'])
ax.set(xlabel='Price')
plt.xlim(-9,80)
plt.show()
```



In [24]:

```
training=pd.get_dummies(data,columns=["S.No."])
final_train=training
final_train.head()
```

Out[24]:

	Name	Location	Year	Kilometers_Driven	Fuel_Type	Transmission	Owner_Type	Mi
0	Maruti Wagon R LXI CNG	Mumbai	2010	72000	CNG	Manual	First	
1	Hyundai Creta 1.6 CRDi SX Option	Pune	2015	41000	Diesel	Manual	First	
2	Honda Jazz V	Chennai	2011	46000	Petrol	Manual	First	
3	Maruti Ertiga VDI	Chennai	2012	87000	Diesel	Manual	First	
4	Audi A4 New 2.0 TDI Multitronic	Coimbatore	2013	40670	Diesel	Automatic	Second	

5 rows × 7263 columns



In []:

EXPLORATORY DATA ANALYSIS

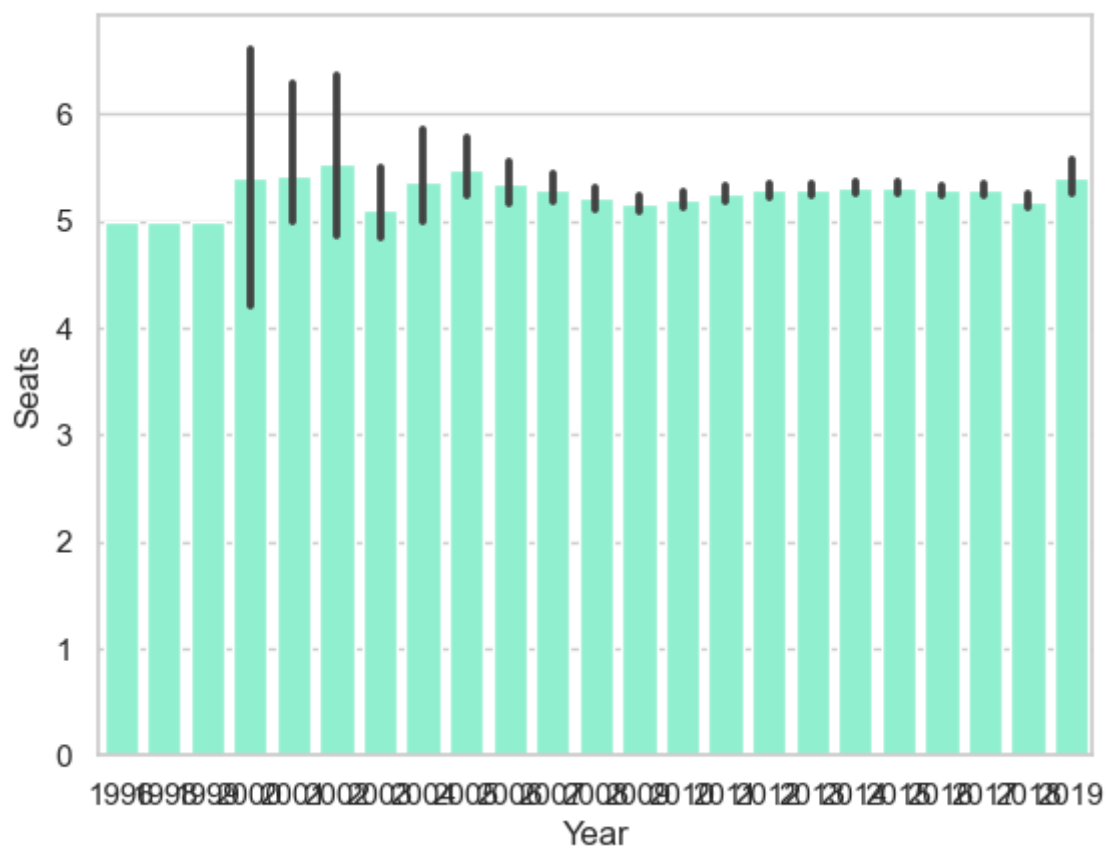
In [27]:

```
sns.barplot(x='Price',y='Year',data=final_train,color='mediumturquoise')  
plt.show()
```



In [28]:

```
import seaborn as sns
import matplotlib.pyplot as plt
sns.barplot(x='Year',y='Seats',data=df,color='aquamarine')
plt.show()
```



In []: