second hand cars data analysis

data scraping done in cars 24 website

In [ ]:

importing librareys

In [1]:
```
import numpy as np
import pandas as pd
import re
import requests
from bs4 import BeautifulSoup

import matplotlib.pyplot as plt
import seaborn as sns

import warnings
warnings.filterwarnings('ignore')
```

In [ ]:

data scraping from cars 24 webiste

In [38]:
```
list_of_companys = ['datsun','hyundi','honda','maruti','renault','tata','volkswagen','toyota']
list_of_citycode = [2378,2,3686,1692,4709,134,777]



Car_price = []
car_brand=[]
car_model_year = []
car_name = []
model_car = []
gare_type = []
KM_car = []
owner_type = []
fuel_type = []
state = []


for companys in list_of_companys:


    for city in list_of_citycode:

        url = f'''https://www.cars24.com/buy-used-car?f=make%3A%3D%3A{companys}&sort=bestmatch
            &serveWarrantyCount=true&listingSource=Homepage_Filters&storeCityId={city}'''




        car_g = requests.get(url)
        car_g
        car_soup = BeautifulSoup(car_g.text)
        CAR = car_soup.find_all('span')
        price = car_soup.find_all('div', class_="_18ToE")


        for t in price:
            a = t.text
            b = re.findall(r'(₹\d+,\d+,\d+)',a)
            if len(b) > 0 :
                Car_price.append(b[0])

                # Car_price
            else:
                Car_price.append(np.nan)

        year_car = car_soup.find_all('h2', class_="_2lmIw")

        for y in year_car:
            a = y.text
            b = re.findall(r'\d+',a)
            if len(b) > 0:
                car_model_year.append(b[0])

            else:
                car_model_year.append(np.nan)
                # car_model_year

        C_name = car_soup.find_all('h2', class_="_2lmIw")

        for u in C_name:
            a = u.text
            b = re.findall(r'\s\w+\s',a)
            if len(b) > 0:
                car_brand.append(b[0])
            else:
                car_brand.append(np.nan)

                # car_brand
```

```
for o in C_name:
    a = o.text
    b = re.findall(r'\s\w+(\s\w+)', a)
    if len(b) > 0:
        car_name.append(b[0])
        # car_name
    else:
        car_name.append(np.nan)

car_model = car_soup.find_all('ul', class_="_1hOnS")

for p in car_model:
    a = p.text
    b = re.findall(r'\w+',a)
    #     print(a)
    if len(b) > 0:
        model_car.append(b[0])
    else:
        model_car.append(np.nan)


for q in car_model:
    a = q.text
    b = re.findall(r'Manual|Automatic',a)
    if len(b)>0:
        gare_type.append(b[0])

    else:
        gare_type.append(np.nan)

car_km = car_soup.find_all('ul', class_="_13yb6")

for w in car_km:
    a = w.text
    b = re.findall(r'\d+,\d+',a)
    if len(b) > 0:
        KM_car.append(b[0])
        # KM_car
    else:

        KM_car.append(np.nan)


owner = car_soup.find_all('ul', class_="_13yb6")
for e in owner:
    a = e.text
    b = re.findall(r'km(\w+\sOwner)',a)
    if len(b) > 0:
        owner_type.append(b[0])

    else:
        owner_type.append(np.nan)

fuel = car_soup.find_all('ul', class_="_13yb6")


for i in fuel:
    a = i.text
        #     print(a)
    b = re.findall(r'Petrol|Diesel|CNG|Electric',a)

    if len(b) > 0:

        fuel_type.append(b[0])

    else:
        fuel_type.append(np.nan)
        #
```

```
        for f in fuel:
            a = i.text
            b = re.findall(r'MH|DL|TS|GJ|KA|UP|WB|HR',a)
            if len(b) > 0:
                state.append(b[0])
            else:
                state.append(np.nan)



                #
                #
                # fuel_type
        #     print(fuel_type)
```

In [ ]:

In [ ]:

In [39]:
```
df_dict  = {

    'COMPANY' : car_brand,
    'CAR NAME' : car_name,
    'CAR MANF YEAR' : car_model_year,
    'TRANSMMISTION' : gare_type,
    'FUEL TYPE' : fuel_type ,
    'PRICE'  : Car_price,
    'DRIVEN KM' : KM_car,
    'OWNER TYPE' : owner_type,
    'LOCATIONs' : state
}

df = pd.DataFrame(df_dict)

df
```

Out[39]:

	COMPANY	CAR NAME	CAR MANF YEAR	TRANSMMISTION	FUEL TYPE	PRICE	DRIVEN KM	OWNER TYPE	LOCATIONs
0	Datsun	Redi	2018	Manual	Petrol	₹2,92,000	11,500	1st Owner	MH
1	Datsun	Redi	2016	Manual	Petrol	₹2,53,000	10,724	1st Owner	MH
2	Datsun	Go	2014	Manual	Petrol	₹2,50,000	18,499	1st Owner	MH
3	Datsun	Redi	2018	Automatic	Petrol	₹3,38,000	45,531	1st Owner	MH
4	Datsun	Redi	2018	Manual	Petrol	₹2,89,000	46,291	1st Owner	MH
...	...	...	...	...	...	...	...	...	...
811	Toyota	Etios	2011	Manual	Petrol	₹2,13,000	55,314	1st Owner	WB
812	Toyota	Corolla	2013	Manual	Petrol	₹4,34,000	56,766	3rd Owner	WB
813	Toyota	Etios	2014	Manual	Petrol	₹3,17,000	87,733	2nd Owner	WB
814	Toyota	Corolla	2013	Manual	Diesel	₹4,16,000	43,285	2nd Owner	WB
815	Toyota	YARIS	2018	Manual	Petrol	₹7,20,000	24,092	2nd Owner	WB

816 rows × 9 columns

In [ ]:

In [40]:
```
a = len(df)
df = df.sample(a)
df = df.reset_index()
df.drop('index',axis = 1,inplace = True)
```

In [ ]:

This is an scarped data from website

In [41]:
```
df
```

Out[41]:

	COMPANY	CAR NAME	CAR MANF YEAR	TRANSMMISTION	FUEL TYPE	PRICE	DRIVEN KM	OWNER TYPE	LOCATIONs
0	Toyota	YARIS	2020	Manual	Petrol	₹7,96,000	41,032	1st Owner	DL
1	Renault	TRIBER	2022	Automatic	Petrol	₹8,01,000	29,302	1st Owner	TS
2	Renault	Kwid	2020	Automatic	Petrol	₹4,82,000	12,413	1st Owner	TS
3	Toyota	YARIS	2018	Automatic	Petrol	₹8,98,000	33,951	1st Owner	TS
4	Maruti	Swift	2017	Manual	Diesel	₹6,32,000	58,006	1st Owner	TS
...	...	...	...	...	...	...	...	...	...
811	Tata	NEXON	2021	Automatic	Diesel	₹10,42,000	26,606	1st Owner	GJ
812	Maruti	S	2017	Manual	Diesel	₹5,85,000	49,727	1st Owner	GJ
813	Maruti	Swift	2020	Manual	Petrol	₹5,92,000	54,364	1st Owner	GJ
814	Toyota	YARIS	2021	Manual	Petrol	₹9,85,000	17,875	2nd Owner	KA
815	Maruti	Swift	2012	Manual	Petrol	₹2,82,000	83,421	1st Owner	DL

816 rows × 9 columns

In [42]:
```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 816 entries, 0 to 815
Data columns (total 9 columns):
 #   Column         Non-Null Count  Dtype 
---  ------         --------------  ----- 
 0   COMPANY        816 non-null    object
 1   CAR NAME       816 non-null    object
 2   CAR MANF YEAR  816 non-null    object
 3   TRANSMMISTION  816 non-null    object
 4   FUEL TYPE      816 non-null    object
 5   PRICE          816 non-null    object
 6   DRIVEN KM      816 non-null    object
 7   OWNER TYPE     816 non-null    object
 8   LOCATIONs      816 non-null    object
dtypes: object(9)
memory usage: 57.5+ KB
```

In [ ]:

Data Cleaning

In [ ]:

Cheecking duplicates

In [43]:
```
df.duplicated().value_counts()
```

Out[43]:
```
False    742
True      74
dtype: int64
```

In [54]:
```
df = df.drop_duplicates()
```

In [55]:
```
df
```

Out[55]:

	COMPANY	CAR NAME	CAR MANF YEAR	TRANSMMISTION	FUEL TYPE	PRICE	DRIVEN KM	OWNER TYPE	LOCATIONs
0	Toyota	YARIS	2020	Manual	Petrol	₹7,96,000	41,032	1st Owner	DL
1	Renault	TRIBER	2022	Automatic	Petrol	₹8,01,000	29,302	1st Owner	TS
2	Renault	Kwid	2020	Automatic	Petrol	₹4,82,000	12,413	1st Owner	TS
3	Toyota	YARIS	2018	Automatic	Petrol	₹8,98,000	33,951	1st Owner	TS
4	Maruti	Swift	2017	Manual	Diesel	₹6,32,000	58,006	1st Owner	TS
...	...	...	...	...	...	...	...	...	...
811	Tata	NEXON	2021	Automatic	Diesel	₹10,42,000	26,606	1st Owner	GJ
812	Maruti	S	2017	Manual	Diesel	₹5,85,000	49,727	1st Owner	GJ
813	Maruti	Swift	2020	Manual	Petrol	₹5,92,000	54,364	1st Owner	GJ
814	Toyota	YARIS	2021	Manual	Petrol	₹9,85,000	17,875	2nd Owner	KA
815	Maruti	Swift	2012	Manual	Petrol	₹2,82,000	83,421	1st Owner	DL

742 rows × 9 columns

In [58]:
```
df.duplicated().value_counts()
```

Out[58]:
```
False    742
dtype: int64
```

cheeking null values

In [59]:
```
df.isna().sum()
```

Out[59]:
```
COMPANY          0
CAR NAME         0
CAR MANF YEAR    0
TRANSMMISTION    0
FUEL TYPE        0
PRICE            0
DRIVEN KM        0
OWNER TYPE       0
LOCATIONs        0
dtype: int64
```

removing un-wanted things based on columns

In [60]:
```
df['PRICE'] = df['PRICE'].str.replace(',' ,'')
df['PRICE'] = df['PRICE'].str.replace('₹','')
df['DRIVEN KM'] = df['DRIVEN KM'].str.replace(',' , '')
```

In [61]:
```
df = df.reset_index()
df.drop('index' ,axis = 1 ,inplace = True)
```

In [62]:
```
df
```

Out[62]:

	COMPANY	CAR NAME	CAR MANF YEAR	TRANSMMISTION	FUEL TYPE	PRICE	DRIVEN KM	OWNER TYPE	LOCATIONs
0	Toyota	YARIS	2020	Manual	Petrol	796000	41032	1st Owner	DL
1	Renault	TRIBER	2022	Automatic	Petrol	801000	29302	1st Owner	TS
2	Renault	Kwid	2020	Automatic	Petrol	482000	12413	1st Owner	TS
3	Toyota	YARIS	2018	Automatic	Petrol	898000	33951	1st Owner	TS
4	Maruti	Swift	2017	Manual	Diesel	632000	58006	1st Owner	TS
...	...	...	...	...	...	...	...	...	...
737	Tata	NEXON	2021	Automatic	Diesel	1042000	26606	1st Owner	GJ
738	Maruti	S	2017	Manual	Diesel	585000	49727	1st Owner	GJ
739	Maruti	Swift	2020	Manual	Petrol	592000	54364	1st Owner	GJ
740	Toyota	YARIS	2021	Manual	Petrol	985000	17875	2nd Owner	KA
741	Maruti	Swift	2012	Manual	Petrol	282000	83421	1st Owner	DL

742 rows × 9 columns

In [63]:
```
df['CAR MANF YEAR']=pd.to_datetime(df['CAR MANF YEAR'])
```

In [64]:
```
df['CAR MANF YEAR']=(df['CAR MANF YEAR'].dt.year)
```

In [65]:
```
df
```

Out[65]:

	COMPANY	CAR NAME	CAR MANF YEAR	TRANSMMISTION	FUEL TYPE	PRICE	DRIVEN KM	OWNER TYPE	LOCATIONs
0	Toyota	YARIS	2020	Manual	Petrol	796000	41032	1st Owner	DL
1	Renault	TRIBER	2022	Automatic	Petrol	801000	29302	1st Owner	TS
2	Renault	Kwid	2020	Automatic	Petrol	482000	12413	1st Owner	TS
3	Toyota	YARIS	2018	Automatic	Petrol	898000	33951	1st Owner	TS
4	Maruti	Swift	2017	Manual	Diesel	632000	58006	1st Owner	TS
...	...	...	...	...	...	...	...	...	...
737	Tata	NEXON	2021	Automatic	Diesel	1042000	26606	1st Owner	GJ
738	Maruti	S	2017	Manual	Diesel	585000	49727	1st Owner	GJ
739	Maruti	Swift	2020	Manual	Petrol	592000	54364	1st Owner	GJ
740	Toyota	YARIS	2021	Manual	Petrol	985000	17875	2nd Owner	KA
741	Maruti	Swift	2012	Manual	Petrol	282000	83421	1st Owner	DL

742 rows × 9 columns

In [66]:
```
df.to_csv('final data cars.csv') # data stored in final data cars as csv
```

In [67]:
```
df1 = pd.read_csv('final data cars.csv')
df1
```

Out[67]:

	Unnamed: 0	COMPANY	CAR NAME	CAR MANF YEAR	TRANSMMISTION	FUEL TYPE	PRICE	DRIVEN KM	OWNER TYPE	LOCATIONs
0	0	Toyota	YARIS	2020	Manual	Petrol	796000	41032	1st Owner	DL
1	1	Renault	TRIBER	2022	Automatic	Petrol	801000	29302	1st Owner	TS
2	2	Renault	Kwid	2020	Automatic	Petrol	482000	12413	1st Owner	TS
3	3	Toyota	YARIS	2018	Automatic	Petrol	898000	33951	1st Owner	TS
4	4	Maruti	Swift	2017	Manual	Diesel	632000	58006	1st Owner	TS
...	...	...	...	...	...	...	...	...	...	...
737	737	Tata	NEXON	2021	Automatic	Diesel	1042000	26606	1st Owner	GJ
738	738	Maruti	S	2017	Manual	Diesel	585000	49727	1st Owner	GJ
739	739	Maruti	Swift	2020	Manual	Petrol	592000	54364	1st Owner	GJ
740	740	Toyota	YARIS	2021	Manual	Petrol	985000	17875	2nd Owner	KA
741	741	Maruti	Swift	2012	Manual	Petrol	282000	83421	1st Owner	DL

742 rows × 10 columns

In [68]:
```
df1.drop('Unnamed: 0', axis = 1 , inplace = True)
```

In [69]:
```
df1
```

Out[69]:

	COMPANY	CAR NAME	CAR MANF YEAR	TRANSMMISTION	FUEL TYPE	PRICE	DRIVEN KM	OWNER TYPE	LOCATIONs
0	Toyota	YARIS	2020	Manual	Petrol	796000	41032	1st Owner	DL
1	Renault	TRIBER	2022	Automatic	Petrol	801000	29302	1st Owner	TS
2	Renault	Kwid	2020	Automatic	Petrol	482000	12413	1st Owner	TS
3	Toyota	YARIS	2018	Automatic	Petrol	898000	33951	1st Owner	TS
4	Maruti	Swift	2017	Manual	Diesel	632000	58006	1st Owner	TS
...	...	...	...	...	...	...	...	...	...
737	Tata	NEXON	2021	Automatic	Diesel	1042000	26606	1st Owner	GJ
738	Maruti	S	2017	Manual	Diesel	585000	49727	1st Owner	GJ
739	Maruti	Swift	2020	Manual	Petrol	592000	54364	1st Owner	GJ
740	Toyota	YARIS	2021	Manual	Petrol	985000	17875	2nd Owner	KA
741	Maruti	Swift	2012	Manual	Petrol	282000	83421	1st Owner	DL

742 rows × 9 columns

In [ ]:

In [70]:
```
df1.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 742 entries, 0 to 741
Data columns (total 9 columns):
 #   Column         Non-Null Count  Dtype 
---  ------         --------------  ----- 
 0   COMPANY        742 non-null    object
 1   CAR NAME       742 non-null    object
 2   CAR MANF YEAR  742 non-null    int64 
 3   TRANSMMISTION  742 non-null    object
 4   FUEL TYPE      742 non-null    object
 5   PRICE          742 non-null    int64 
 6   DRIVEN KM      742 non-null    int64 
 7   OWNER TYPE     742 non-null    object
 8   LOCATIONs      742 non-null    object
dtypes: int64(3), object(6)
memory usage: 52.3+ KB
```

In [ ]:
```
```

Exploratory Data Analysis

In [71]:
```
df1.describe()
```

Out[71]:

	CAR MANF YEAR	PRICE	DRIVEN KM
count	742.000000	7.420000e+02	742.000000
mean	2017.345013	5.837268e+05	45098.028302
std	2.910653	2.872906e+05	26481.525241
min	2010.000000	1.180000e+05	100.000000
25%	2016.000000	3.722500e+05	25004.750000
50%	2018.000000	5.415000e+05	43886.000000
75%	2019.000000	7.400000e+05	65479.500000
max	2022.000000	2.164000e+06	99943.000000

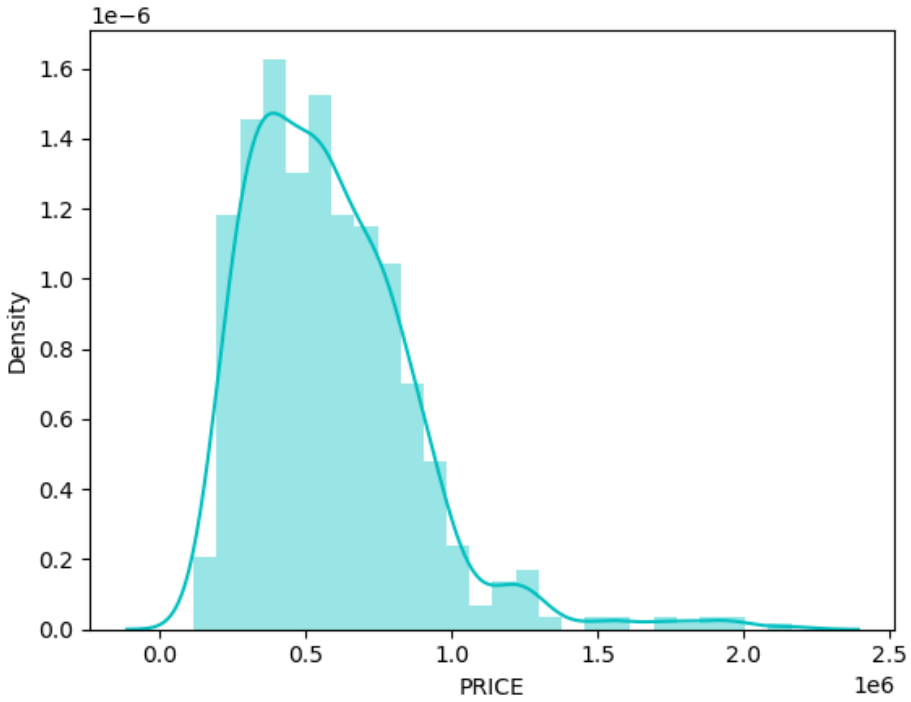
In [72]:
```
df1.head()
```

Out[72]:

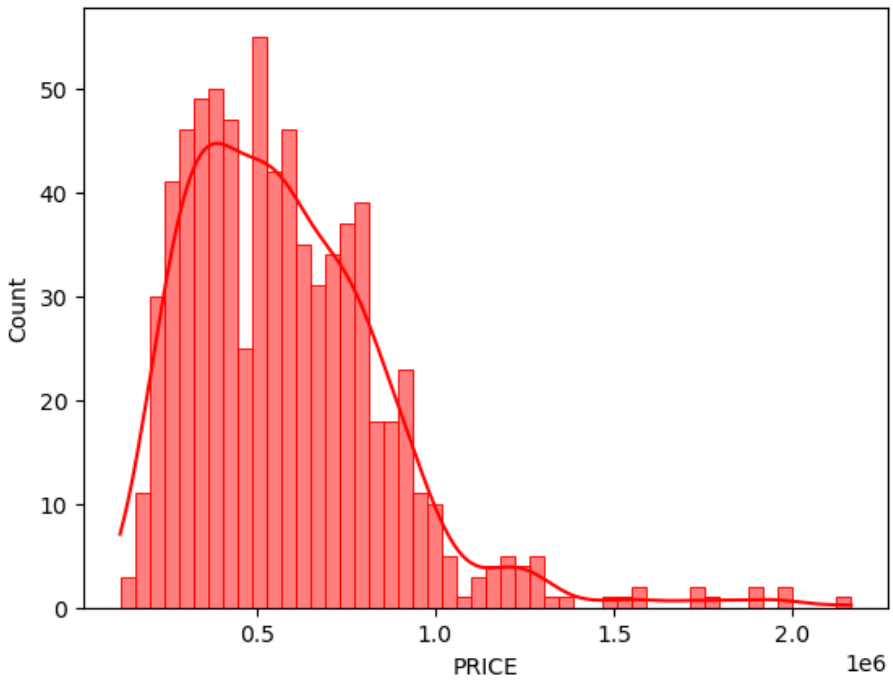
	COMPANY	CAR NAME	CAR MANF YEAR	TRANSMMISTION	FUEL TYPE	PRICE	DRIVEN KM	OWNER TYPE	LOCATIONs
0	Toyota	YARIS	2020	Manual	Petrol	796000	41032	1st Owner	DL
1	Renault	TRIBER	2022	Automatic	Petrol	801000	29302	1st Owner	TS
2	Renault	Kwid	2020	Automatic	Petrol	482000	12413	1st Owner	TS
3	Toyota	YARIS	2018	Automatic	Petrol	898000	33951	1st Owner	TS
4	Maruti	Swift	2017	Manual	Diesel	632000	58006	1st Owner	TS

disribution of price columns

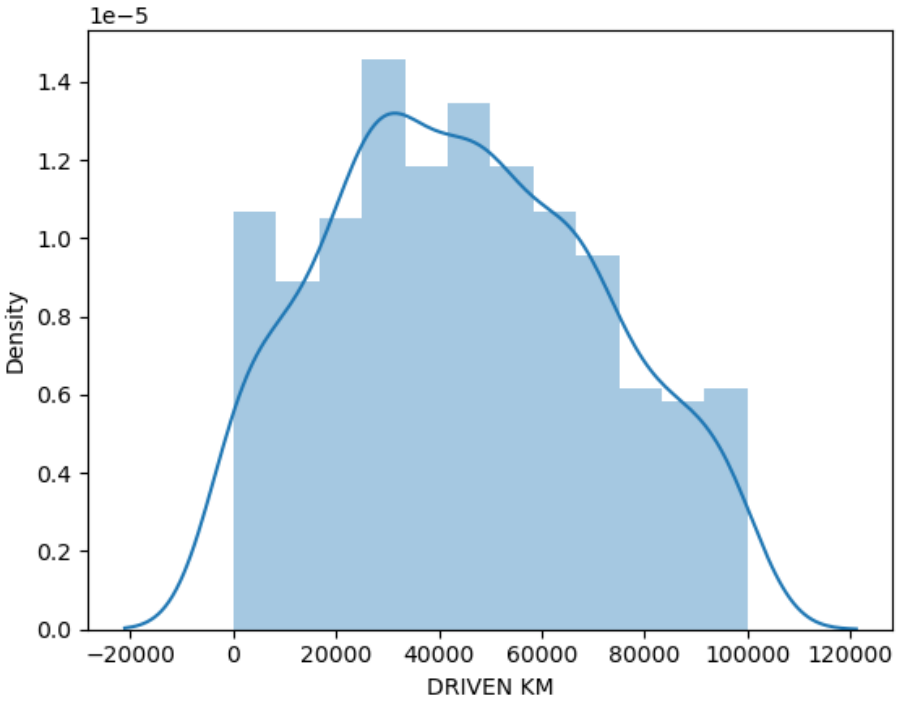
In [73]:
```
sns.distplot(df1['PRICE'],color = 'c')
plt.show()
```



In [74]:
```
sns.histplot(df1['PRICE'] , bins = 50,kde = True,color = 'r',ec = 'r')
plt.show()
```



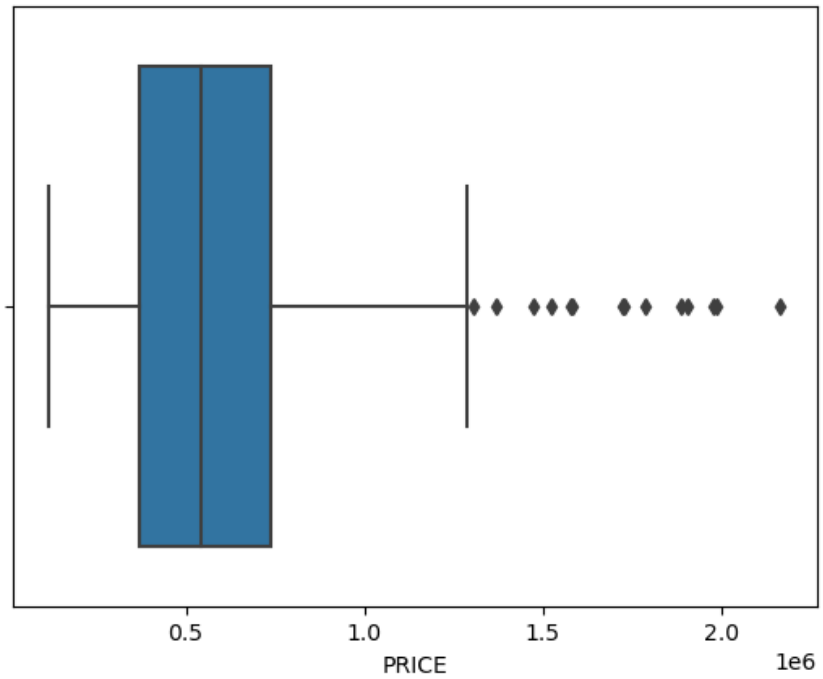
In [75]:
```
sns.distplot(df1['DRIVEN KM'])
plt.show()
```



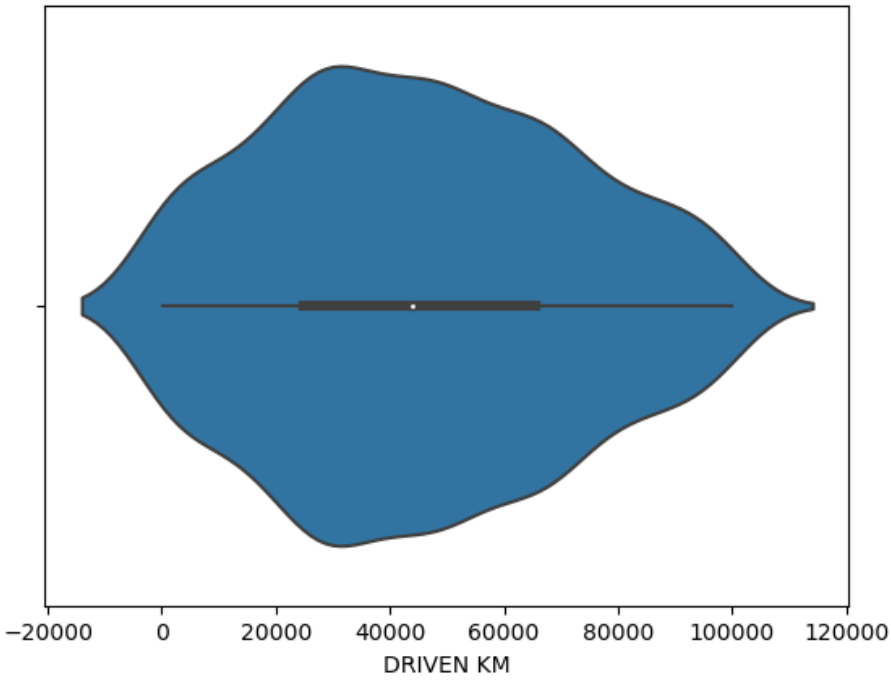
In [ ]:
```
```

outlayers detection

In [76]:
```
sns.boxplot(df1['PRICE'])
plt.show()
```



In [77]:
```
sns.violinplot(df1['DRIVEN KM'],)
plt.show()
```



In [ ]:

In [ ]:

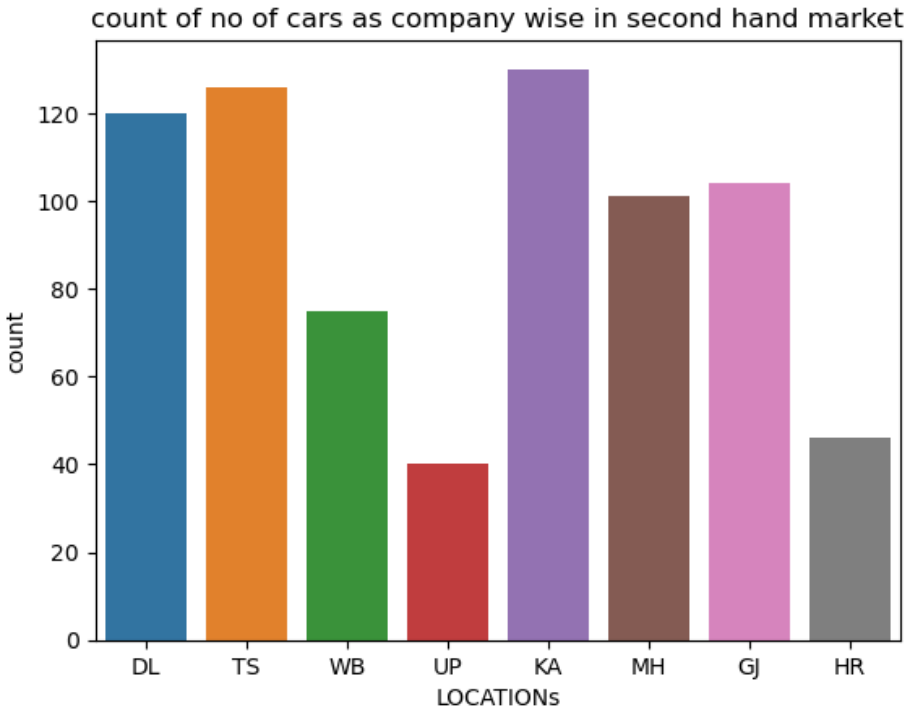
Univariate analysis

In [78]:
```
df.head()
```

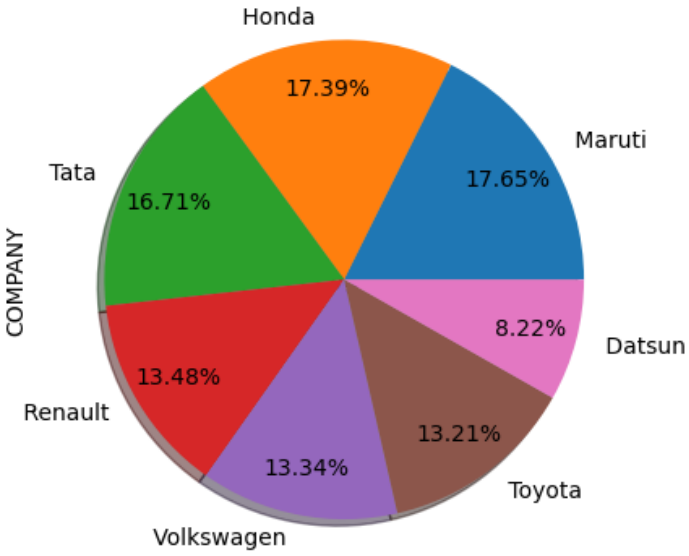
Out[78]:

	COMPANY	CAR NAME	CAR MANF YEAR	TRANSMMISTION	FUEL TYPE	PRICE	DRIVEN KM	OWNER TYPE	LOCATIONs
0	Toyota	YARIS	2020	Manual	Petrol	796000	41032	1st Owner	DL
1	Renault	TRIBER	2022	Automatic	Petrol	801000	29302	1st Owner	TS
2	Renault	Kwid	2020	Automatic	Petrol	482000	12413	1st Owner	TS
3	Toyota	YARIS	2018	Automatic	Petrol	898000	33951	1st Owner	TS
4	Maruti	Swift	2017	Manual	Diesel	632000	58006	1st Owner	TS

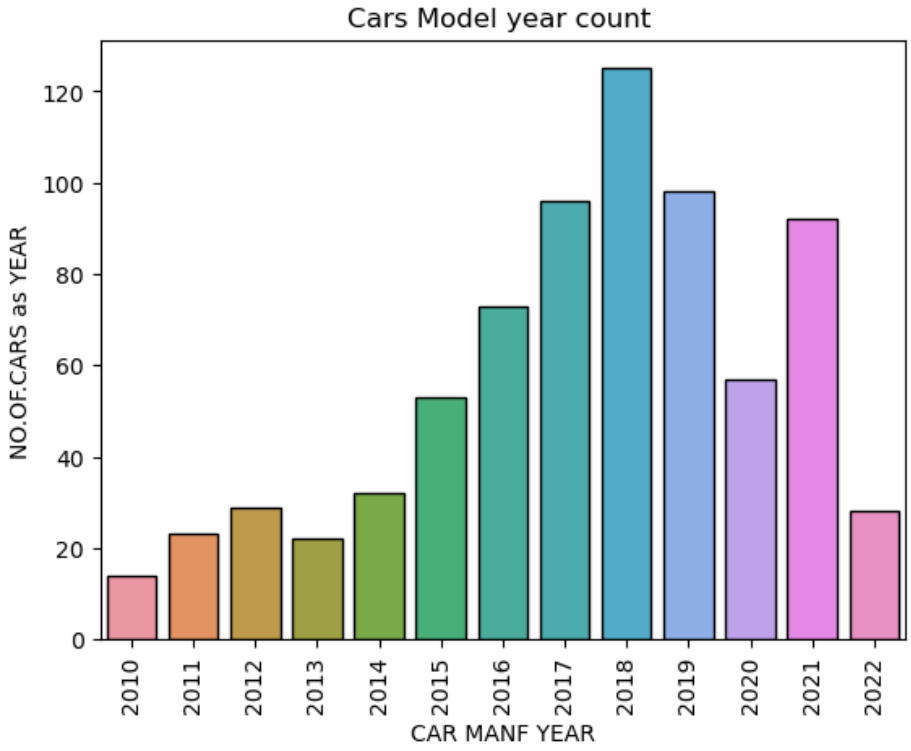
In [79]:
```
sns.countplot(x = df['LOCATIONs'])
plt.title('count of no of cars as company wise in second hand market')
plt.show()
```



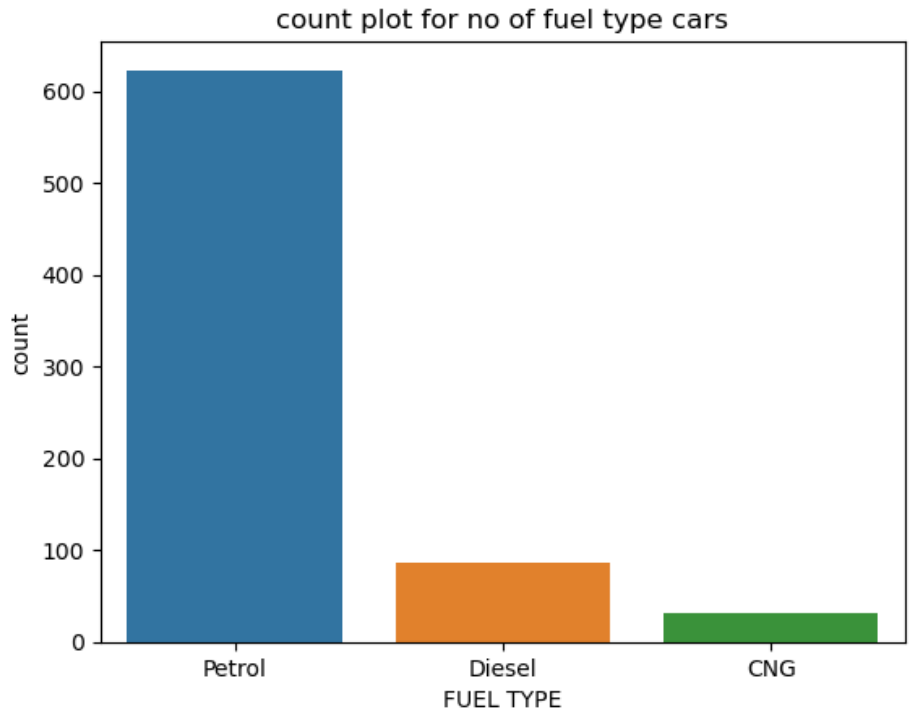
In [80]:
```
df['COMPANY'].value_counts().plot(kind = 'pie', autopct = '%0.2F%%',shadow = True,pctdistance=0.8,)
plt.show()
```



In [81]:
```
sns.countplot(df1['CAR MANF YEAR'],ec = 'k')
plt.xticks(rotation = 90)
plt.title('Cars Model year count ')
plt.ylabel('NO.OF.CARS as YEAR')
plt.show()
```

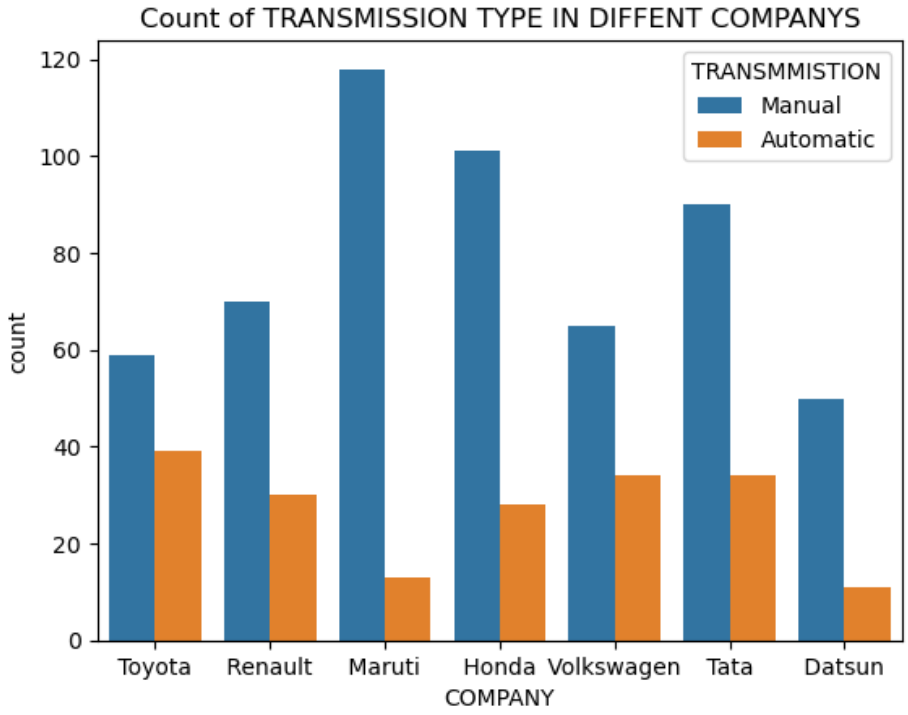


In [82]:
```
sns.countplot(df1['FUEL TYPE'])
plt.title('count plot for no of fuel type cars')
plt.show()
```

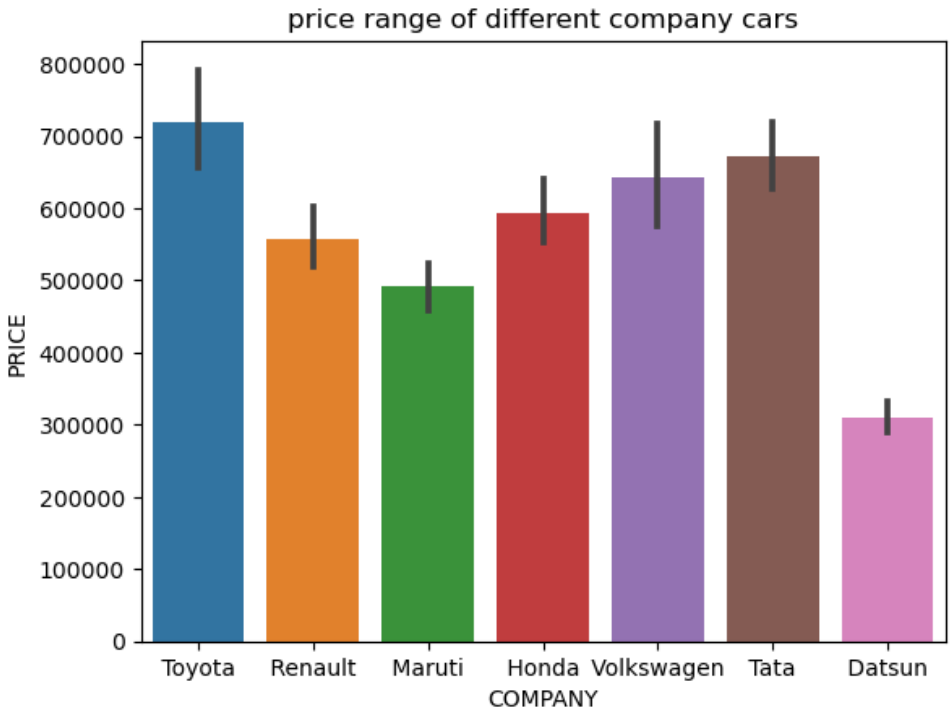


Bi- variate analysis

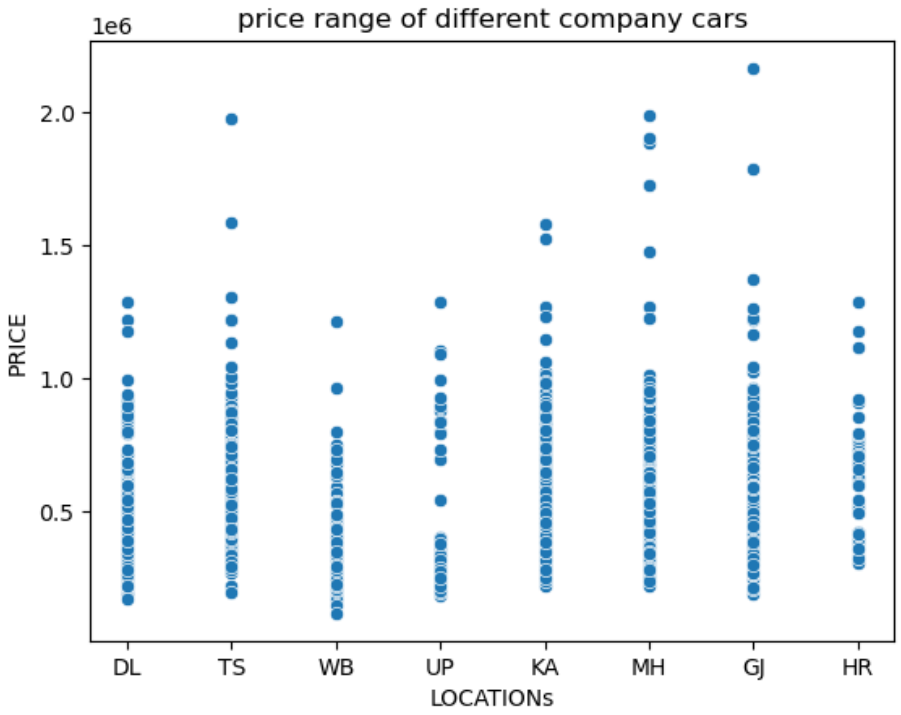
In [83]:
```
sns.countplot(df1['COMPANY'],hue = df1['TRANSMMISTION'])
plt.title('Count of TRANSMISSION TYPE IN DIFFENT COMPANYS')
plt.show()
```



In [84]:
```
sns.barplot(df1['COMPANY'],df1['PRICE'])
plt.title('price range of different company cars')
plt.show()
```



In [85]:
```
sns.scatterplot(df1['LOCATIONs'],df1['PRICE'])
plt.title('price range of different company cars')
plt.show()
```

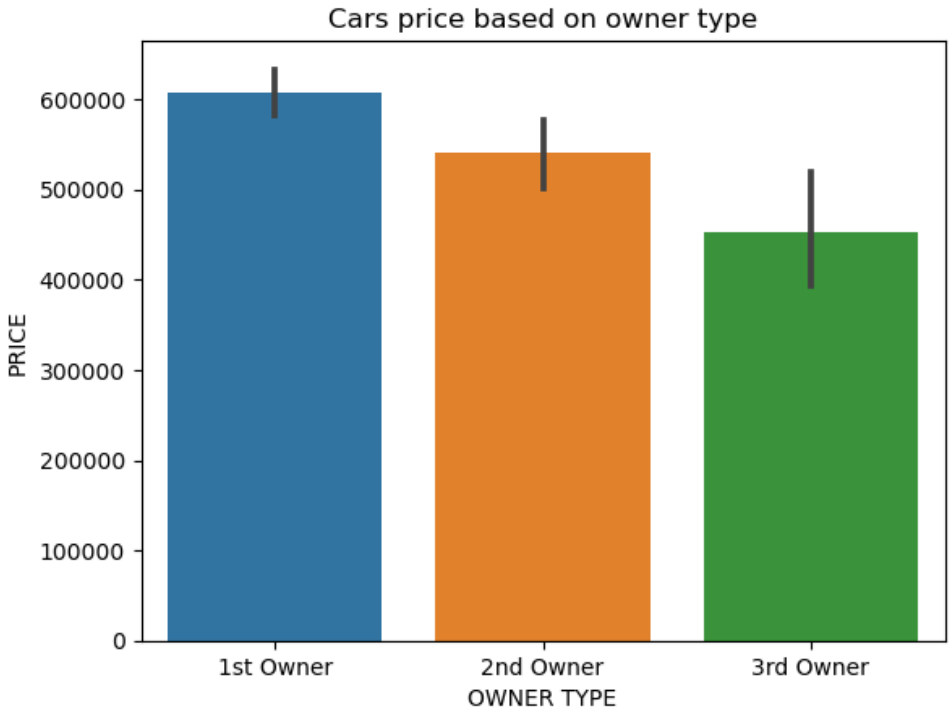


In [86]:
```
df1.head()
```

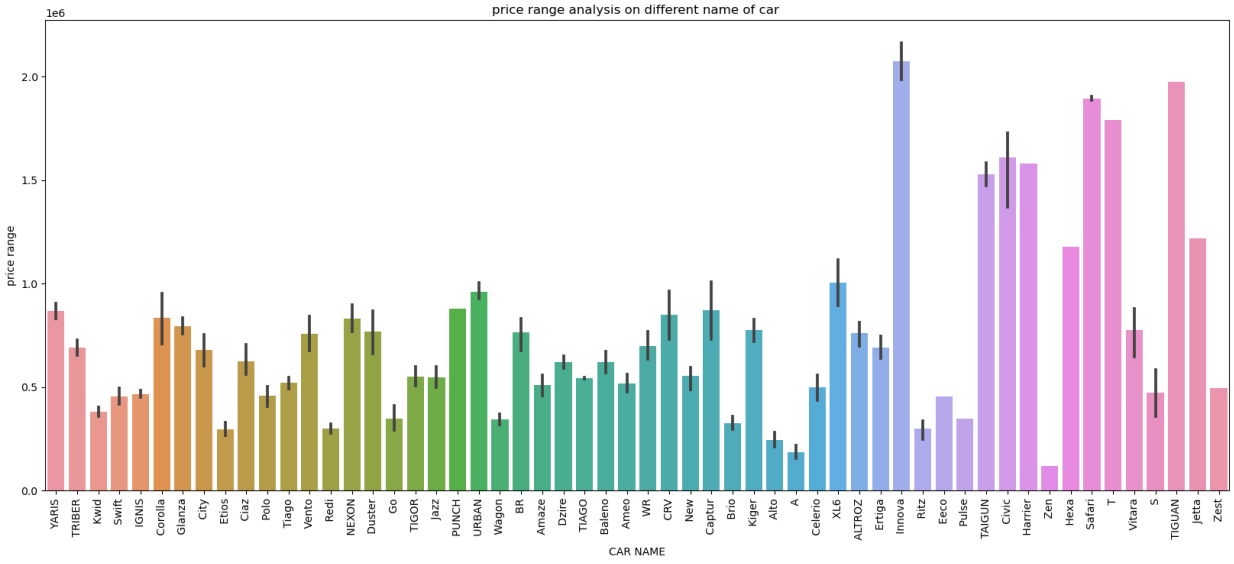
Out[86]:

	COMPANY	CAR NAME	CAR MANF YEAR	TRANSMMISTION	FUEL TYPE	PRICE	DRIVEN KM	OWNER TYPE	LOCATIONs
0	Toyota	YARIS	2020	Manual	Petrol	796000	41032	1st Owner	DL
1	Renault	TRIBER	2022	Automatic	Petrol	801000	29302	1st Owner	TS
2	Renault	Kwid	2020	Automatic	Petrol	482000	12413	1st Owner	TS
3	Toyota	YARIS	2018	Automatic	Petrol	898000	33951	1st Owner	TS
4	Maruti	Swift	2017	Manual	Diesel	632000	58006	1st Owner	TS

In [87]:
```
sns.barplot(df1['OWNER TYPE'],df1['PRICE'])
plt.title('Cars price based on owner type')
plt.show()
```

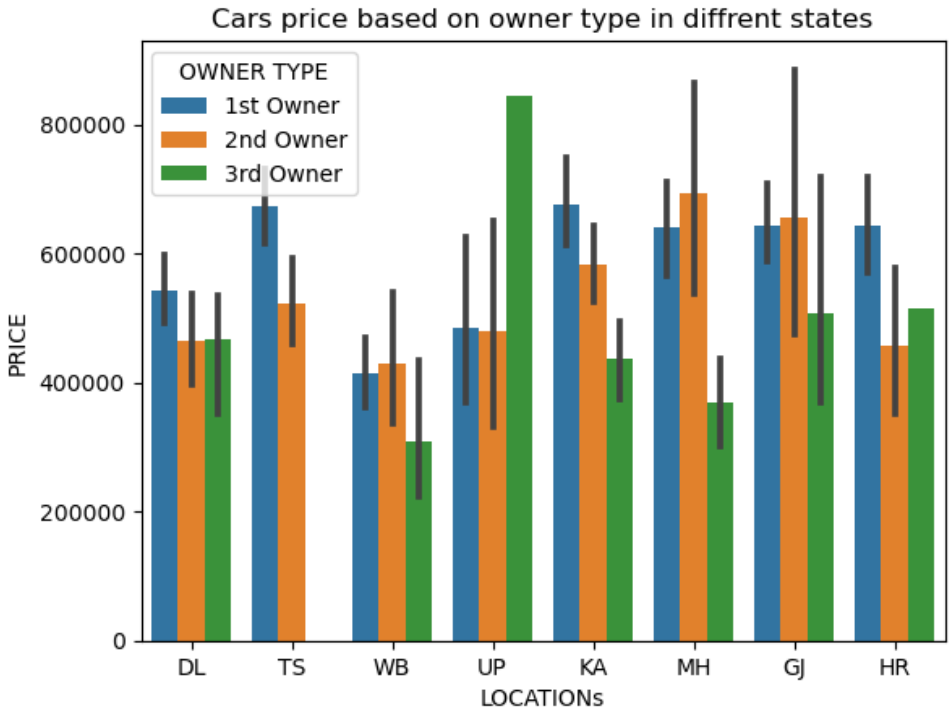


In [88]:
```
plt.figure(figsize=(20,8))
sns.barplot(x = df1['CAR NAME'],y = df1['PRICE'])
plt.title('price range analysis on different name of car ')
plt.xticks(rotation = 90)
plt.ylabel('price range')
plt.show()
```

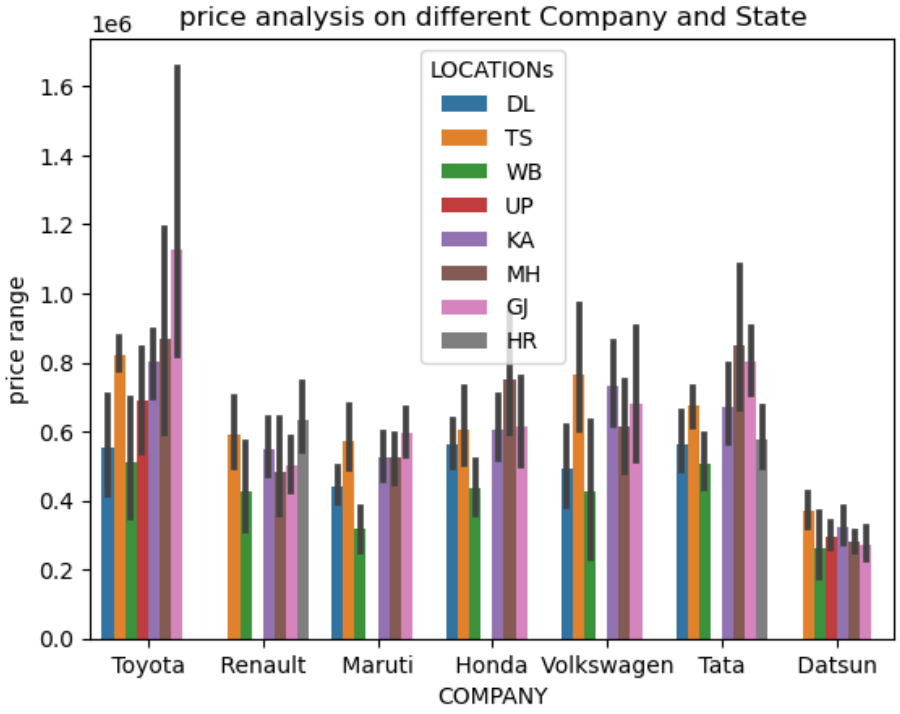


Multivariate analysis

In [102]:
```
sns.barplot(df['LOCATIONs'],df1['PRICE'],hue = df1['OWNER TYPE'])
plt.title('Cars price based on owner type in diffrent states')
plt.show()
```



In [103]:
```
sns.barplot(x = df1['COMPANY'],y = df1['PRICE'],hue = df1['LOCATIONs'])
plt.title('price analysis on different Company and State')
plt.ylabel('price range')
plt.show()
```

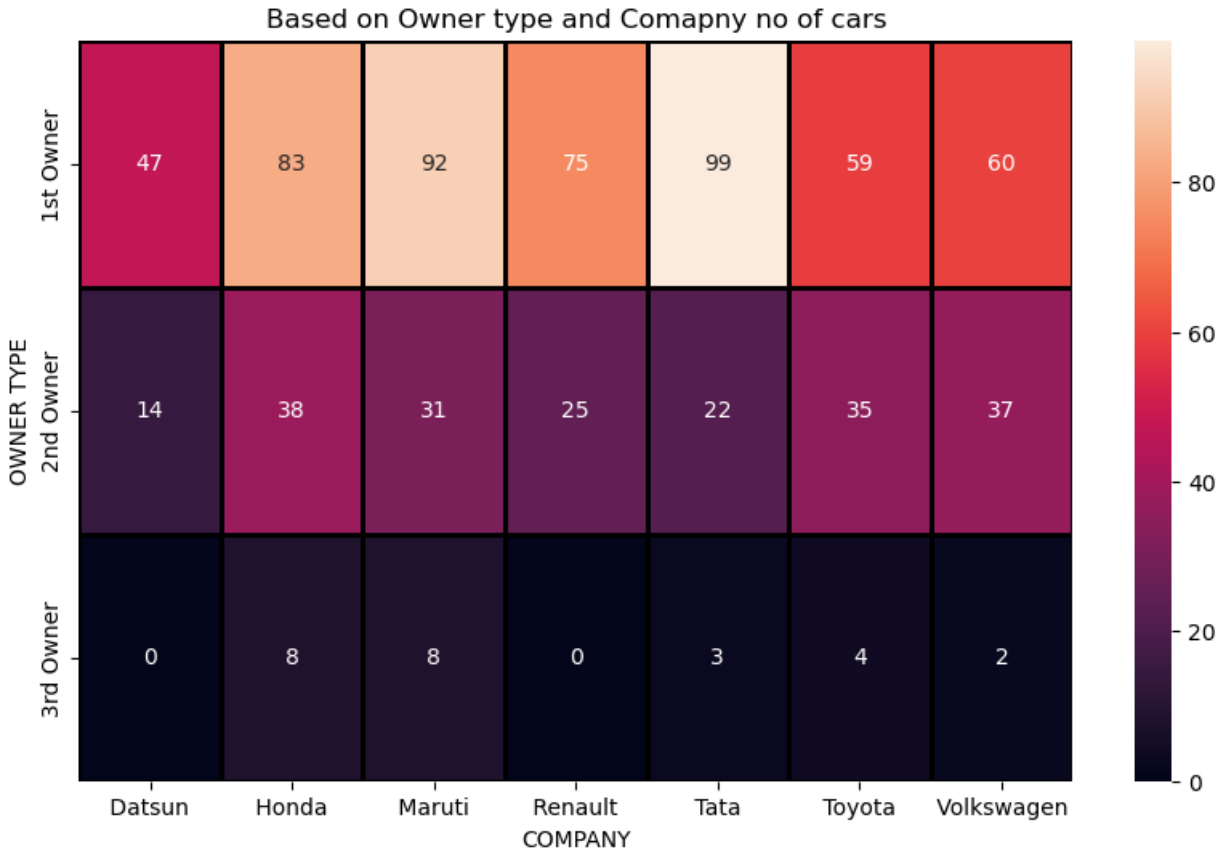


In [104]:
```
dfh = pd.crosstab(index = df1['OWNER TYPE'],columns = df1['COMPANY'])
dfh
```

Out[104]:

OWNER TYPE \ COMPANY	Datsun	Honda	Maruti	Renault	Tata	Toyota	Volkswagen
1st Owner	47	83	92	75	99	59	60
2nd Owner	14	38	31	25	22	35	37
3rd Owner	0	8	8	0	3	4	2

In [105]:
```
plt.figure(figsize=(10,6))
sns.heatmap(dfh, linecolor = 'k' , linewidth = 2 , annot = True)
plt.title('Based on Owner type and Comapny no of cars')
plt.show()
```

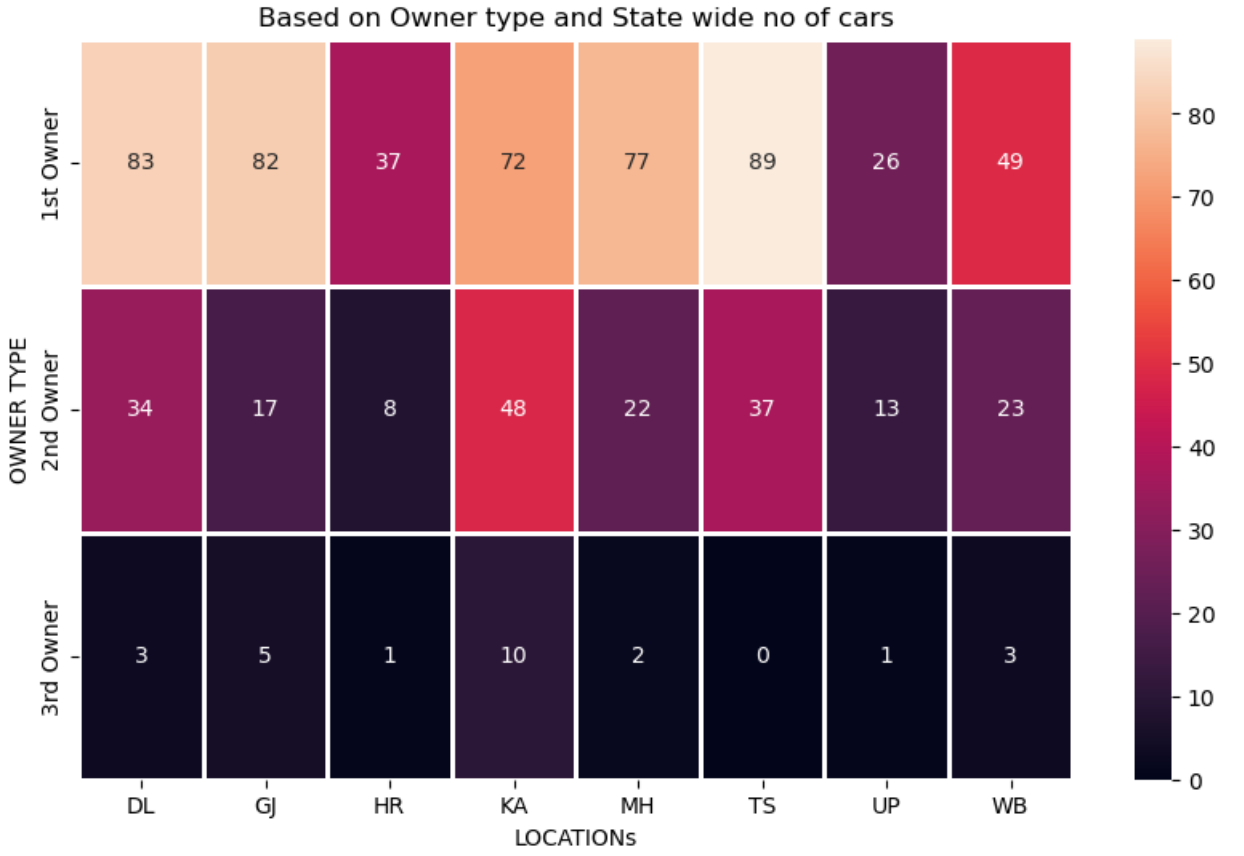


In [106]:
```
dfh1 = pd.crosstab(index = df1['OWNER TYPE'],columns = df1['LOCATIONs'])
dfh1
```

Out[106]:

OWNER TYPE \ LOCATIONs	DL	GJ	HR	KA	MH	TS	UP	WB
1st Owner	83	82	37	72	77	89	26	49
2nd Owner	34	17	8	48	22	37	13	23
3rd Owner	3	5	1	10	2	0	1	3

In [107]:
```
plt.figure(figsize=(10,6))
sns.heatmap(dfh1,ec = 'k',linewidth = 2 , annot = True)
plt.title('Based on Owner type and State wide no of cars')
plt.show()
```



In [ ]:

In [ ]:

Top 10 Cars having least & highest prices in different locations?

In [108]:
```
df1.head()
```

Out[108]:

	COMPANY	CAR NAME	CAR MANF YEAR	TRANSMMISTION	FUEL TYPE	PRICE	DRIVEN KM	OWNER TYPE	LOCATIONs
0	Toyota	YARIS	2020	Manual	Petrol	796000	41032	1st Owner	DL
1	Renault	TRIBER	2022	Automatic	Petrol	801000	29302	1st Owner	TS
2	Renault	Kwid	2020	Automatic	Petrol	482000	12413	1st Owner	TS
3	Toyota	YARIS	2018	Automatic	Petrol	898000	33951	1st Owner	TS
4	Maruti	Swift	2017	Manual	Diesel	632000	58006	1st Owner	TS

In [109]:
```
df1.sort_values(by = 'PRICE',ascending = False).head(10)
```

Out[109]:

	COMPANY	CAR NAME	CAR MANF YEAR	TRANSMMISTION	FUEL TYPE	PRICE	DRIVEN KM	OWNER TYPE	LOCATIONs
560	Toyota	Innova	2021	Manual	Diesel	2164000	17721	2nd Owner	GJ
185	Toyota	Innova	2020	Manual	Diesel	1984000	47338	2nd Owner	MH
592	Volkswagen	TIGUAN	2018	Automatic	Diesel	1975000	92569	1st Owner	TS
510	Tata	Safari	2021	Automatic	Diesel	1903000	14915	2nd Owner	MH
469	Tata	Safari	2021	Manual	Diesel	1885000	32656	1st Owner	MH
516	Volkswagen	T	2019	Automatic	Petrol	1788000	34211	1st Owner	GJ
411	Honda	Civic	2019	Automatic	Petrol	1728000	24520	1st Owner	MH
535	Honda	Civic	2020	Automatic	Petrol	1724000	30097	1st Owner	MH
403	Volkswagen	TAIGUN	2022	Manual	Petrol	1583000	15956	1st Owner	TS
414	Tata	Harrier	2019	Manual	Diesel	1578000	28315	1st Owner	KA

In [110]:
```
df1.sort_values(by = 'PRICE',ascending = False).tail(10)
```

Out[110]:

	COMPANY	CAR NAME	CAR MANF YEAR	TRANSMMISTION	FUEL TYPE	PRICE	DRIVEN KM	OWNER TYPE	LOCATIONs
300	Honda	City	2010	Manual	Petrol	190000	114	1st Owner	DL
214	Maruti	Alto	2012	Manual	Petrol	189000	68473	1st Owner	WB
104	Datsun	Redi	2017	Manual	Petrol	186000	26603	1st Owner	UP
216	Maruti	Alto	2014	Manual	Petrol	182000	46318	1st Owner	WB
97	Datsun	Go	2014	Manual	Petrol	176000	62884	1st Owner	WB
262	Maruti	Alto	2014	Manual	Petrol	173000	85119	1st Owner	WB
684	Maruti	Swift	2010	Manual	Petrol	171000	41170	1st Owner	DL
114	Maruti	A	2010	Manual	Petrol	155000	79497	1st Owner	WB
298	Maruti	Alto	2011	Manual	Petrol	150000	42709	1st Owner	WB
415	Maruti	Zen	2010	Manual	Petrol	118000	44057	2nd Owner	WB

Which Car has lowest price an highest price in Telangana

In [ ]:
```
```

In [111]:
```
dfg = df1.groupby('LOCATIONs')
```

In [112]:
```
dft = dfg.get_group('TS')
dft
```

Out[112]:

	COMPANY	CAR NAME	CAR MANF YEAR	TRANSMMISTION	FUEL TYPE	PRICE	DRIVEN KM	OWNER TYPE	LOCATIONs
1	Renault	TRIBER	2022	Automatic	Petrol	801000	29302	1st Owner	TS
2	Renault	Kwid	2020	Automatic	Petrol	482000	12413	1st Owner	TS
3	Toyota	YARIS	2018	Automatic	Petrol	898000	33951	1st Owner	TS
4	Maruti	Swift	2017	Manual	Diesel	632000	58006	1st Owner	TS
21	Renault	Duster	2015	Manual	Diesel	553000	91556	1st Owner	TS
...	...	...	...	...	...	...	...	...	...
700	Maruti	Ritz	2012	Manual	Diesel	313000	118	2nd Owner	TS
705	Renault	TRIBER	2021	Automatic	Petrol	714000	18023	1st Owner	TS
708	Volkswagen	Polo	2016	Manual	Petrol	435200	89240	1st Owner	TS
720	Renault	Kiger	2021	Manual	Petrol	743000	51670	1st Owner	TS
728	Renault	Kwid	2016	Manual	Petrol	296000	42203	2nd Owner	TS

126 rows × 9 columns

In [113]:
```
# Highest price car
dft[dft['PRICE'] == dft['PRICE'].max()]
```

Out[113]:

	COMPANY	CAR NAME	CAR MANF YEAR	TRANSMMISTION	FUEL TYPE	PRICE	DRIVEN KM	OWNER TYPE	LOCATIONs
592	Volkswagen	TIGUAN	2018	Automatic	Diesel	1975000	92569	1st Owner	TS

In [114]:
```
# Lowest price car
dft[dft['PRICE'] == dft['PRICE'].min()]
```

Out[114]:

	COMPANY	CAR NAME	CAR MANF YEAR	TRANSMMISTION	FUEL TYPE	PRICE	DRIVEN KM	OWNER TYPE	LOCATIONs
506	Maruti	Alto	2012	Manual	Petrol	199000	77013	2nd Owner	TS

In [ ]:
```

```

cars which are 2021 models in location of TS

In [115]:
```
dft[dft['CAR MANF YEAR'] == 2021]
```

Out[115]:

	COMPANY	CAR NAME	CAR MANF YEAR	TRANSMMISTION	FUEL TYPE	PRICE	DRIVEN KM	OWNER TYPE	LOCATIONs
33	Datsun	Go	2021	Manual	Petrol	578000	48957	1st Owner	TS
40	Toyota	URBAN	2021	Manual	Petrol	926000	5676	1st Owner	TS
93	Honda	WR	2021	Manual	Petrol	896000	29919	1st Owner	TS
99	Renault	Kiger	2021	Manual	Petrol	811000	30423	2nd Owner	TS
101	Tata	NEXON	2021	Manual	Petrol	878000	44641	1st Owner	TS
113	Renault	Kiger	2021	Automatic	Petrol	981000	13505	1st Owner	TS
173	Tata	ALTROZ	2021	Manual	Diesel	852000	61626	1st Owner	TS
190	Maruti	XL6	2021	Automatic	Petrol	1217000	44462	2nd Owner	TS
268	Tata	ALTROZ	2021	Manual	Petrol	760000	12280	1st Owner	TS
269	Datsun	Redi	2021	Manual	Petrol	470000	18569	1st Owner	TS
284	Tata	Tiago	2021	Manual	Petrol	572000	43559	1st Owner	TS
293	Datsun	Redi	2021	Manual	Petrol	499000	33730	1st Owner	TS
308	Tata	ALTROZ	2021	Manual	Petrol	749000	14741	1st Owner	TS
607	Volkswagen	Polo	2021	Manual	Petrol	753000	30088	1st Owner	TS
637	Toyota	URBAN	2021	Automatic	Petrol	1044000	37224	1st Owner	TS
686	Renault	Kwid	2021	Manual	Petrol	430000	29828	1st Owner	TS
696	Datsun	Redi	2021	Manual	Petrol	477000	24021	1st Owner	TS
705	Renault	TRIBER	2021	Automatic	Petrol	714000	18023	1st Owner	TS
720	Renault	Kiger	2021	Manual	Petrol	743000	51670	1st Owner	TS

In [ ]:

In [ ]:

In [ ]: