SUMESH R -20104169

In [1]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
from sklearn.model_selection import train_test_split
from sklearn.linear_model import LinearRegression
```

In [2]:
```
df = pd.read_csv("1_fiat500_VehicleSelection_Dataset.csv")[0:1500].dropna(axis="columns
df
```

Out[2]:

	ID	model	engine_power	age_in_days	km	previous_owners	lat	lon	p
0	1.0	lounge	51.0	882.0	25000.0	1.0	44.907242	8.611559868	8
1	2.0	pop	51.0	1186.0	32500.0	1.0	45.666359	12.24188995	8
2	3.0	sport	74.0	4658.0	142228.0	1.0	45.503300	11.41784	4
3	4.0	lounge	51.0	2739.0	160000.0	1.0	40.633171	17.63460922	6
4	5.0	pop	73.0	3074.0	106880.0	1.0	41.903221	12.49565029	5
...	...	...	...	...	...	...	...	...	
1495	1496.0	pop	62.0	3347.0	80000.0	3.0	44.283878	11.88813972	7
1496	1497.0	pop	51.0	1461.0	91055.0	3.0	44.508839	11.46907997	7
1497	1498.0	lounge	51.0	397.0	15840.0	3.0	38.122070	13.36112022	10
1498	1499.0	sport	51.0	1400.0	60000.0	1.0	45.802021	9.187789917	10
1499	1500.0	pop	51.0	1066.0	53100.0	1.0	38.122070	13.36112022	8

1500 rows × 9 columns

In [3]:
```
df.head()
```

Out[3]:

	ID	model	engine_power	age_in_days	km	previous_owners	lat	lon	price
0	1.0	lounge	51.0	882.0	25000.0	1.0	44.907242	8.611559868	8900
1	2.0	pop	51.0	1186.0	32500.0	1.0	45.666359	12.24188995	8800
2	3.0	sport	74.0	4658.0	142228.0	1.0	45.503300	11.41784	4200
3	4.0	lounge	51.0	2739.0	160000.0	1.0	40.633171	17.63460922	6000
4	5.0	pop	73.0	3074.0	106880.0	1.0	41.903221	12.49565029	5700

Data cleaning and pre processing

In [4]:

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 1500 entries, 0 to 1499
Data columns (total 9 columns):
 #   Column           Non-Null Count  Dtype  
---  ------           --------------  -----  
 0   ID               1500 non-null   float64
 1   model            1500 non-null   object 
 2   engine_power     1500 non-null   float64
 3   age_in_days      1500 non-null   float64
 4   km               1500 non-null   float64
 5   previous_owners  1500 non-null   float64
 6   lat              1500 non-null   float64
 7   lon              1500 non-null   object 
 8   price            1500 non-null   object 
dtypes: float64(6), object(3)
memory usage: 105.6+ KB
```

In [5]:

```
df.describe()
```

Out[5]:

	ID	engine_power	age_in_days	km	previous_owners	lat
count	1500.000000	1500.000000	1500.000000	1500.000000	1500.000000	1500.000000
mean	750.500000	51.875333	1641.629333	53074.900000	1.126667	43.545904
std	433.157015	3.911606	1288.091104	39955.013731	0.421197	2.112907
min	1.000000	51.000000	366.000000	1232.000000	1.000000	36.855839
25%	375.750000	51.000000	670.000000	20000.000000	1.000000	41.802990
50%	750.500000	51.000000	1035.000000	38720.000000	1.000000	44.360376
75%	1125.250000	51.000000	2616.000000	78170.250000	1.000000	45.467960
max	1500.000000	77.000000	4658.000000	235000.000000	4.000000	46.795612

In [6]:

```
df.columns
```

Out[6]:

```
Index(['ID', 'model', 'engine_power', 'age_in_days', 'km', 'previous_owners',
       'lat', 'lon', 'price'],
      dtype='object')
```

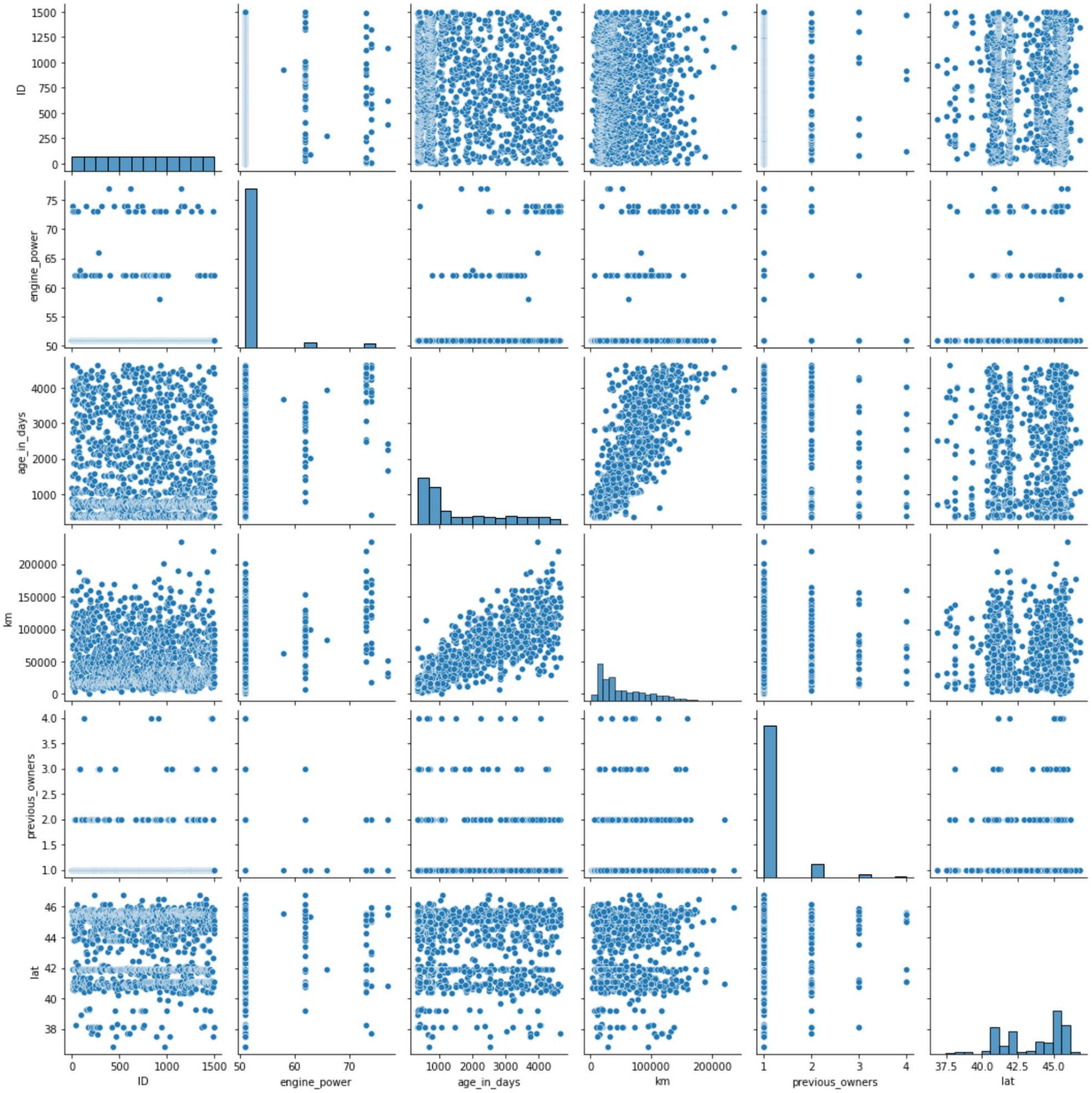
EDA and VISUALIZATION

In [7]:

```
sns.pairplot(df)
```

Out[7]:

```
<seaborn.axisgrid.PairGrid at 0x26b9813ad90>
```



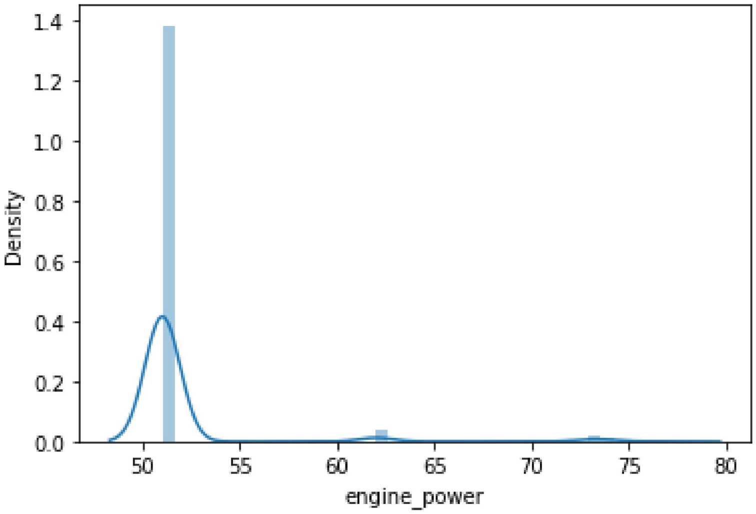
In [8]:

```
sns.distplot(df["engine_power"])
```

```
C:\ProgramData\Anaconda3\lib\site-packages\seaborn\distributions.py:2557: FutureWarning:
`distplot` is a deprecated function and will be removed in a future version. Please adap
t your code to use either `displot` (a figure-level function with similar flexibility) o
r `histplot` (an axes-level function for histograms).
  warnings.warn(msg, FutureWarning)
```

Out[8]:

```
<AxesSubplot:xlabel='engine_power', ylabel='Density'>
```



In [9]:

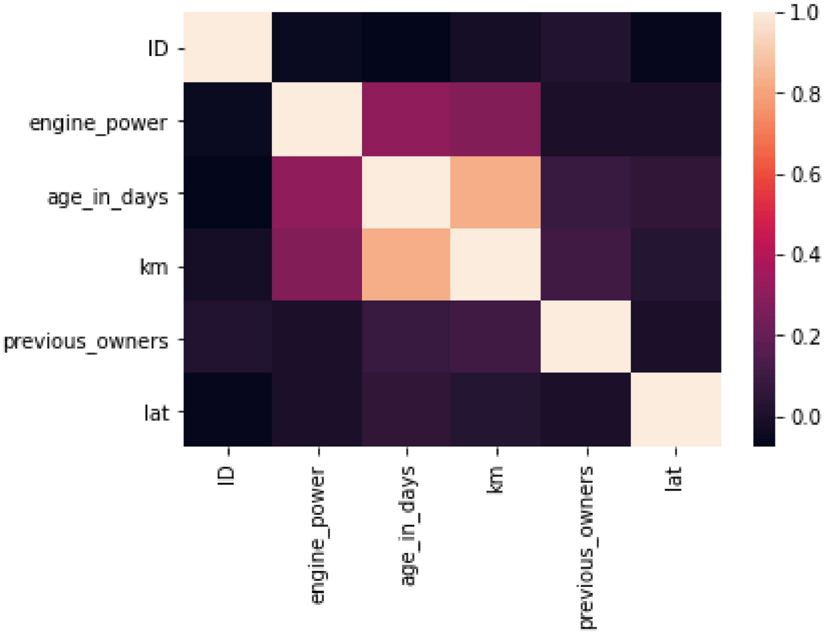
```
df1 = df[['ID', 'model', 'engine_power', 'age_in_days', 'km', 'previous_owners',
       'lat', 'lon', 'price']]
```

In [10]:

```
sns.heatmap(df1.corr())
```

Out[10]:

```
<AxesSubplot:>
```



In [11]:

```
x = df1[['ID', 'age_in_days', 'km', 'previous_owners',
       'lat']]
y = df1['engine_power']
```

split the data into training and test data

In [12]:

```
x_train, x_test, y_train, y_test = train_test_split(x,y,test_size=0.3)
```

In [13]:

```
lr = LinearRegression()
lr.fit(x_train, y_train)
```

Out[13]:

```
LinearRegression()
```

In [14]:

```
lr.intercept_
```

Out[14]:

```
52.76671328218245
```

In [15]:

```
coeff = pd.DataFrame(lr.coef_, x.columns, columns =['Co-efficient'])
coeff
```

Out[15]:

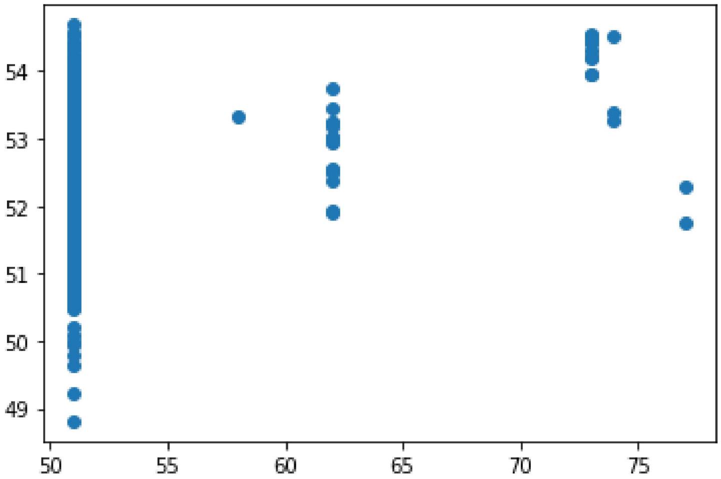
	Co-efficient
ID	-0.000219
age_in_days	0.000745
km	0.000005
previous_owners	-0.581619
lat	-0.036866

In [16]:

```
prediction = lr.predict(x_test)
plt.scatter(y_test, prediction)
```

Out[16]:

```
<matplotlib.collections.PathCollection at 0x26b9a027e20>
```



In [17]:

```
lr.score(x_test,y_test)
```

Out[17]:

```
0.107544924049784
```