In [1]:

```
#Step-1 Importing all the required libraries
import numpy as np
import pandas as pd
import seaborn as sns
import matplotlib.pyplot as plt
from sklearn import preprocessing, svm
from sklearn.model_selection import train_test_split
from sklearn.linear_model import LinearRegression
```

In [2]:

```
#Step-2: Reading the Dataset
df=pd.read_csv(r"C:\Users\yasoda\Documents\202U1A05C1\used_cars_data.csv")
df
```

Out[2]:

	S.No.	Name	Location	Year	Kilometers_Driven	Fuel_Type	Transmission	Owner_Type	Mileage	Engine	Power	Seats	New_Price
0	0	Maruti Wagon R LXI CNG	Mumbai	2010	72000	CNG	Manual	First	26.6 km/kg	998 CC	58.16 bhp	5.0	NaN
1	1	Hyundai Creta 1.6 CRDi SX Option	Pune	2015	41000	Diesel	Manual	First	19.67 kmpl	1582 CC	126.2 bhp	5.0	NaN
2	2	Honda Jazz V	Chennai	2011	46000	Petrol	Manual	First	18.2 kmpl	1199 CC	88.7 bhp	5.0	8.61 Lakh
3	3	Maruti Ertiga VDI	Chennai	2012	87000	Diesel	Manual	First	20.77 kmpl	1248 CC	88.76 bhp	7.0	NaN
4	4	Audi A4 New 2.0 TDI Multitronic	Coimbatore	2013	40670	Diesel	Automatic	Second	15.2 kmpl	1968 CC	140.8 bhp	5.0	NaN
...	...	...	...	...	...	...	...	...	...	...	...	...	...
7248	7248	Volkswagen Vento Diesel Trendline	Hyderabad	2011	89411	Diesel	Manual	First	20.54 kmpl	1598 CC	103.6 bhp	5.0	NaN
7249	7249	Volkswagen Polo GT TSI	Mumbai	2015	59000	Petrol	Automatic	First	17.21 kmpl	1197 CC	103.6 bhp	5.0	NaN
7250	7250	Nissan Micra Diesel XV	Kolkata	2012	28000	Diesel	Manual	First	23.08 kmpl	1461 CC	63.1 bhp	5.0	NaN
7251	7251	Volkswagen Polo GT TSI	Pune	2013	52262	Petrol	Automatic	Third	17.2 kmpl	1197 CC	103.6 bhp	5.0	NaN
7252	7252	Mercedes-Benz E-Class 2009-2013 E 220 CDI Avan...	Kochi	2014	72443	Diesel	Automatic	First	10.0 kmpl	2148 CC	170 bhp	5.0	NaN

7253 rows × 14 columns

In [3]:

```
df = df[['Kilometers_Driven','Year']]
#Taking only selected two attributes from dataset
df.columns = ['kil','yr']
```

In [4]:

```
print('This Dataframe contains %d Rows and %d Columns'%(df.shape))
```

```
This Dataframe contains 7253 Rows and 2 Columns
```

In [5]:

```
df.head()
```

Out[5]:

	kil	yr
0	72000	2010
1	41000	2015
2	46000	2011
3	87000	2012
4	40670	2013

In [6]:

```
df.tail()
```

Out[6]:

	kil	yr
7248	89411	2011
7249	59000	2015
7250	28000	2012
7251	52262	2013
7252	72443	2014

In [7]:
```
df.describe()
```

Out[7]:

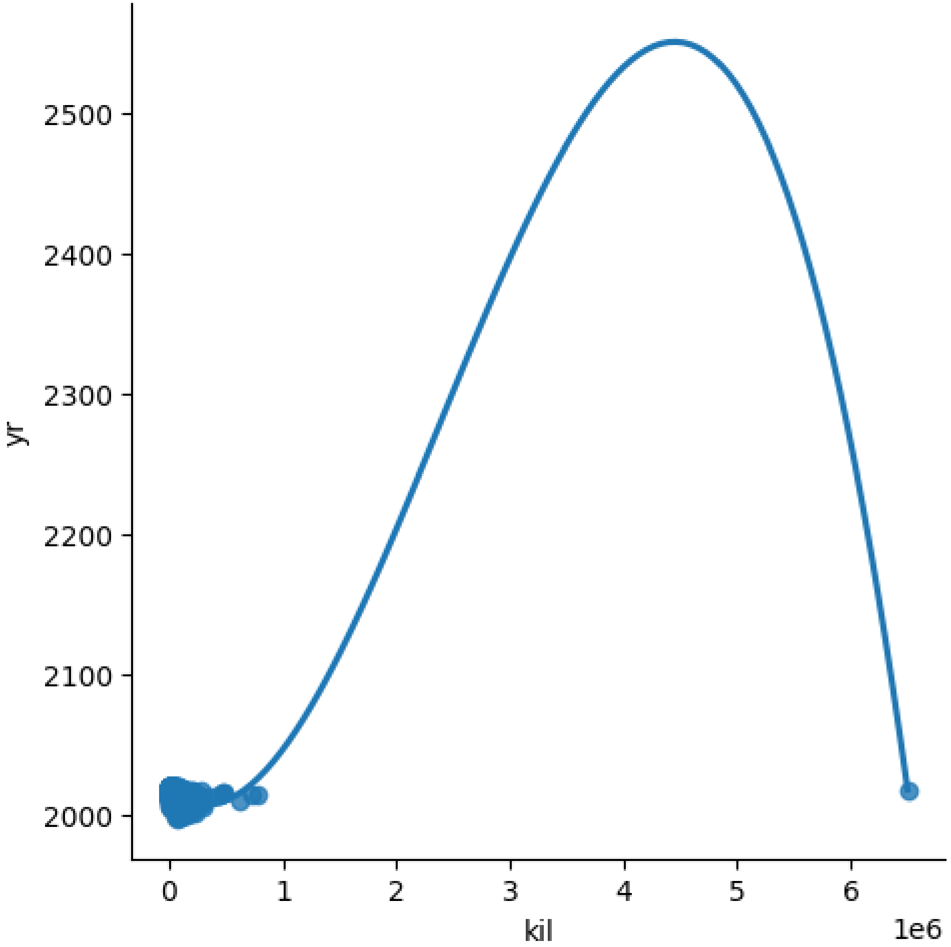
	kil	yr
count	7.253000e+03	7253.000000
mean	5.869906e+04	2013.365366
std	8.442772e+04	3.254421
min	1.710000e+02	1996.000000
25%	3.400000e+04	2011.000000
50%	5.341600e+04	2014.000000
75%	7.300000e+04	2016.000000
max	6.500000e+06	2019.000000

In [8]:
```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 7253 entries, 0 to 7252
Data columns (total 2 columns):
 #   Column  Non-Null Count  Dtype
---  ------  --------------  -----
 0   kil     7253 non-null   int64
 1   yr      7253 non-null   int64
dtypes: int64(2)
memory usage: 113.5 KB
```

In [9]:
```
#Step-3: Exploring the Data Scatter - plotting the data scatter
sns.lmplot(x="kil",y="yr", data = df, order = 3, ci = None)
```

Out[9]:
```
<seaborn.axisgrid.FacetGrid at 0x1cf21a18af0>
```



In [10]:

```
#Step-4: Data cleaning - Eliminating NaN OR missing input numbers
df.fillna(method ='ffill', inplace = True)
```

```
C:\Users\yasoda\AppData\Local\Temp\ipykernel_12684\3221840372.py:2: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returnin
g-a-view-versus-a-copy (https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-versu
s-a-copy)
  df.fillna(method ='ffill', inplace = True)
```

In [11]:

```
# Step-5: Training Our Model
X = np.array(df['kil']).reshape(-1, 1)
y = np.array(df['yr']).reshape(-1, 1)
#Seperating the data into independent and dependent variables and convert
#Now each dataset contains only one coloumn
```

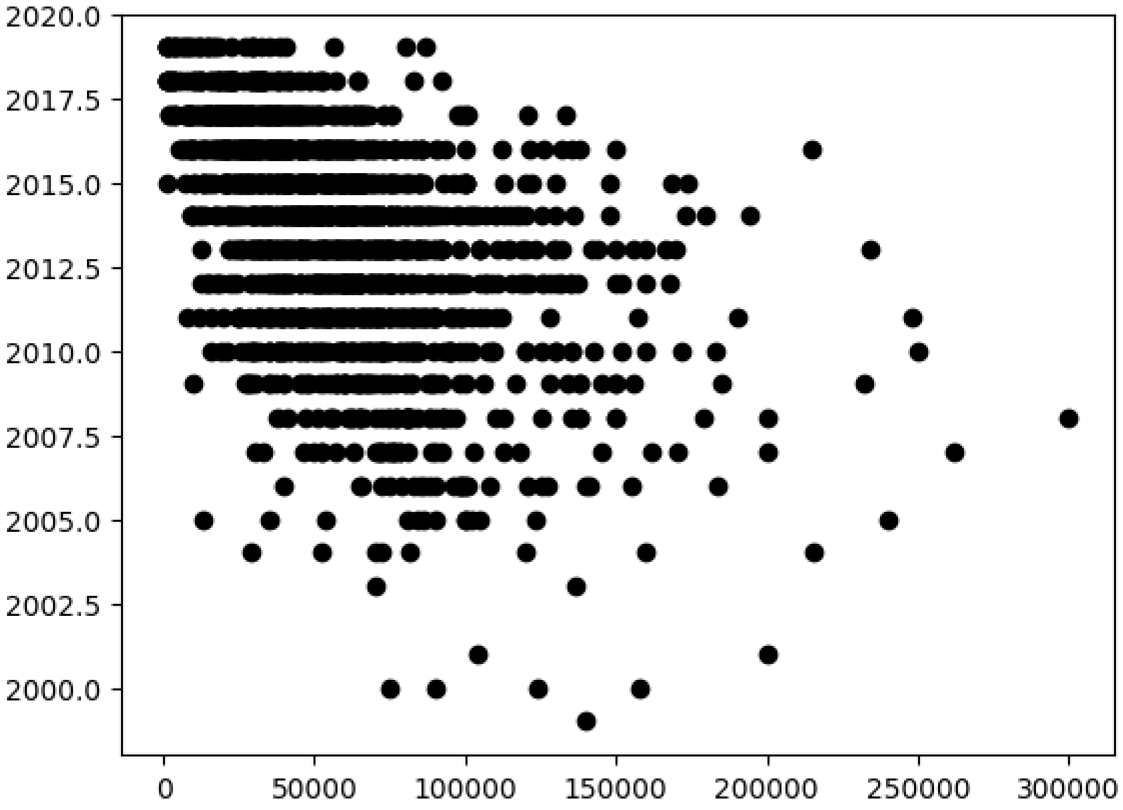
In [16]:

```
X_train,X_test,y_train,y_test = train_test_split(X, y, test_size = 0.25)
# Splitting the data into training data and test data
regr = LinearRegression()
regr.fit(X_train, y_train)
print(regr.score(X_test, y_test))
```

```
0.055282259839578l3
```

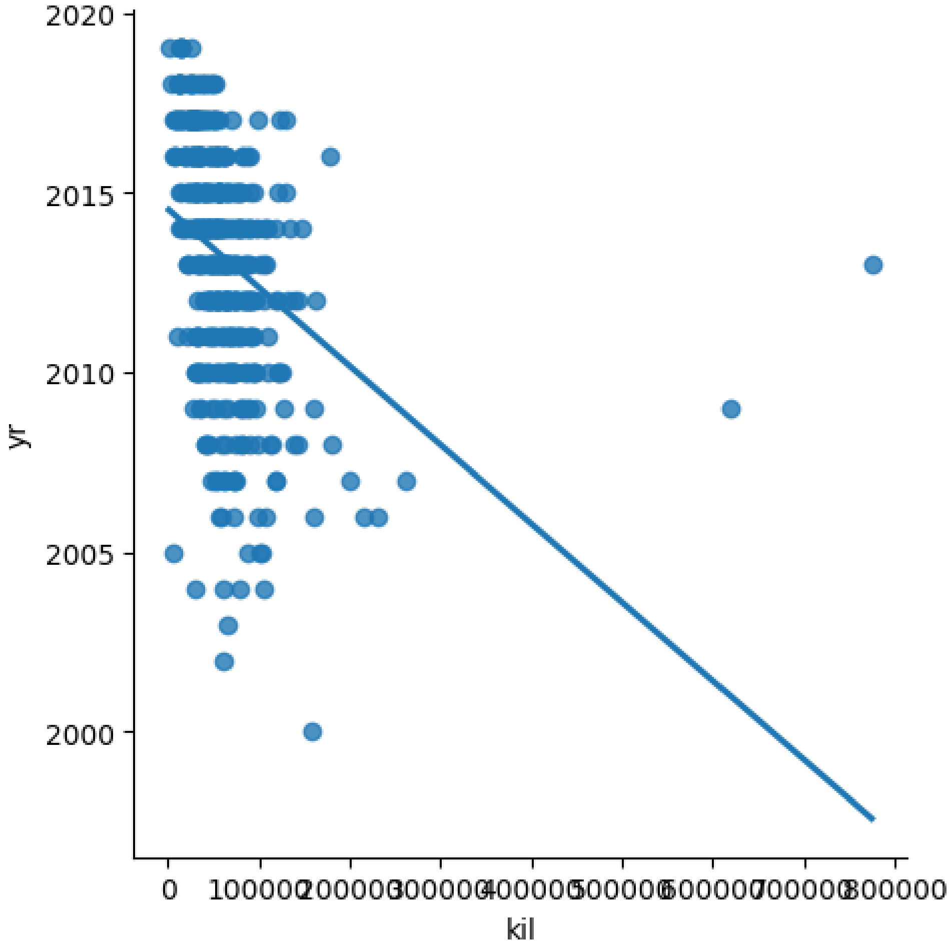
In [17]:

```
#step-6: Exploring Our Results
y_pred = regr.predict(X_test)
plt.scatter(X_test, y_test, color = 'k')
plt.show()
# Data scatter of predicted values
```



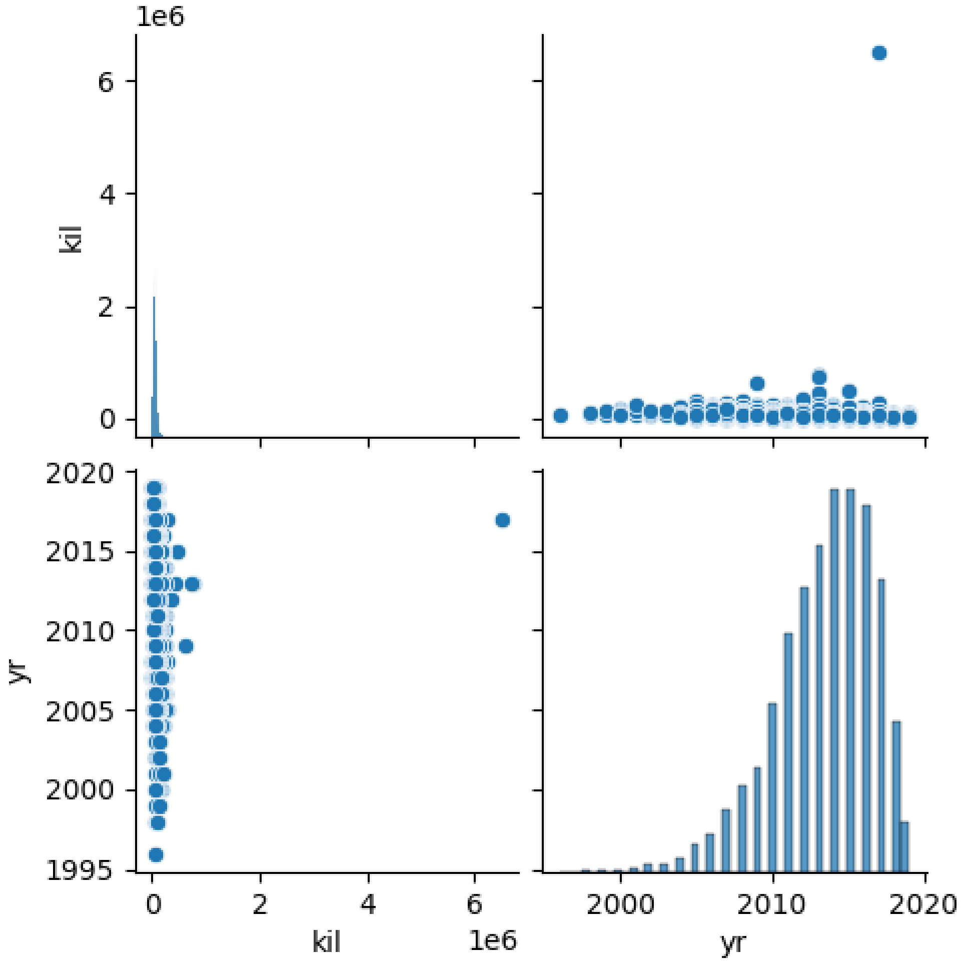
```
In [14]: # Step-7: Working with a smaller Dataset
         df500 = df[:][:500]
         # Selecting the 1st 500 rows of teh data
         sns.lmplot(x = "kil", y = "yr", data = df500, order = 1, ci = None)
```

```
Out[14]: <seaborn.axisgrid.FacetGrid at 0x1cf23cbe1d0>
```



```
In [15]: sns.pairplot(df)

Out[15]: <seaborn.axisgrid.PairGrid at 0x1cf706278b0>
```


1e6
kil
yr
kil
1e6
yr