In [3]:

```
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 [4]:

```
df=pd.read_csv(r"C:\Users\pucha\Downloads\fiat500_VehicleSelection_Dataset.csv")
df
```

Out[4]:

	ID	model	engine_power	age_in_days	km	previous_owners	lat	
0	1	lounge	51	882	25000	1	44.907242	8.61
1	2	pop	51	1186	32500	1	45.666359	12.24
2	3	sport	74	4658	142228	1	45.503300	11.41
3	4	lounge	51	2739	160000	1	40.633171	17.63
4	5	pop	73	3074	106880	1	41.903221	12.49
...	...	...	...	...	...	...	...	
1533	1534	sport	51	3712	115280	1	45.069679	7.70
1534	1535	lounge	74	3835	112000	1	45.845692	8.66
1535	1536	pop	51	2223	60457	1	45.481541	9.41
1536	1537	lounge	51	2557	80750	1	45.000702	7.68
1537	1538	pop	51	1766	54276	1	40.323410	17.56

1538 rows × 9 columns

In [5]:

```
df=df[['age_in_days','km','price']]
df.columns=['age','km','pr']
df.head(10)
```

Out[5]:

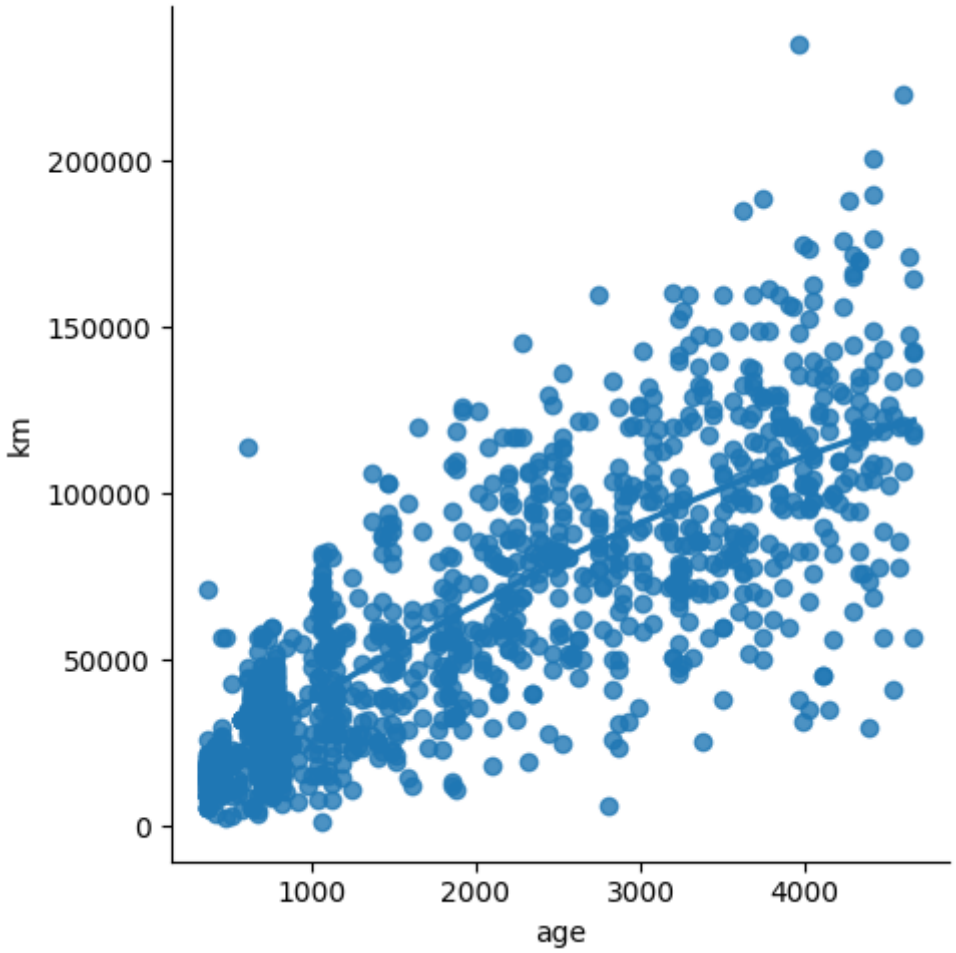
	age	km	pr
0	882	25000	8900
1	1186	32500	8800
2	4658	142228	4200
3	2739	160000	6000
4	3074	106880	5700
5	3623	70225	7900
6	731	11600	10750
7	1521	49076	9190
8	4049	76000	5600
9	3653	89000	6000

In [6]:

```
sns.lmplot(x="age",y="km",data=df,order=2,ci=None)
```

Out[6]:

```
<seaborn.axisgrid.FacetGrid at 0x2301e2d03d0>
```



In [7]:

```
df.describe()
```

Out[7]:

	age	km	pr
count	1538.000000	1538.000000	1538.000000
mean	1650.980494	53396.011704	8576.003901
std	1289.522278	40046.830723	1939.958641
min	366.000000	1232.000000	2500.000000
25%	670.000000	20006.250000	7122.500000
50%	1035.000000	39031.000000	9000.000000
75%	2616.000000	79667.750000	10000.000000
max	4658.000000	235000.000000	11100.000000

In [8]:

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 1538 entries, 0 to 1537
Data columns (total 3 columns):
 #   Column  Non-Null Count  Dtype
---  ------  --------------  -----
 0   age     1538 non-null   int64
 1   km      1538 non-null   int64
 2   pr      1538 non-null   int64
dtypes: int64(3)
memory usage: 36.2 KB
```

In [9]:

```
df.fillna(method='ffill',inplace=True)
```

```
C:\Users\pucha\AppData\Local\Temp\ipykernel_17880\4116506308.py:1: Sett
ingWithCopyWarning:
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#returning-a-view-versus-a-copy (ht
tps://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#ret
urning-a-view-versus-a-copy)
  df.fillna(method='ffill',inplace=True)
```

In [10]:

```
x=np.array(df['age']).reshape(-1,1)
y=np.array(df['km']).reshape(-1,1)
df.dropna(inplace=True)
```

```
C:\Users\pucha\AppData\Local\Temp\ipykernel_17880\1479818408.py:3: Sett
ingWithCopyWarning:
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#returning-a-view-versus-a-copy (ht
tps://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#ret
urning-a-view-versus-a-copy)
  df.dropna(inplace=True)
```

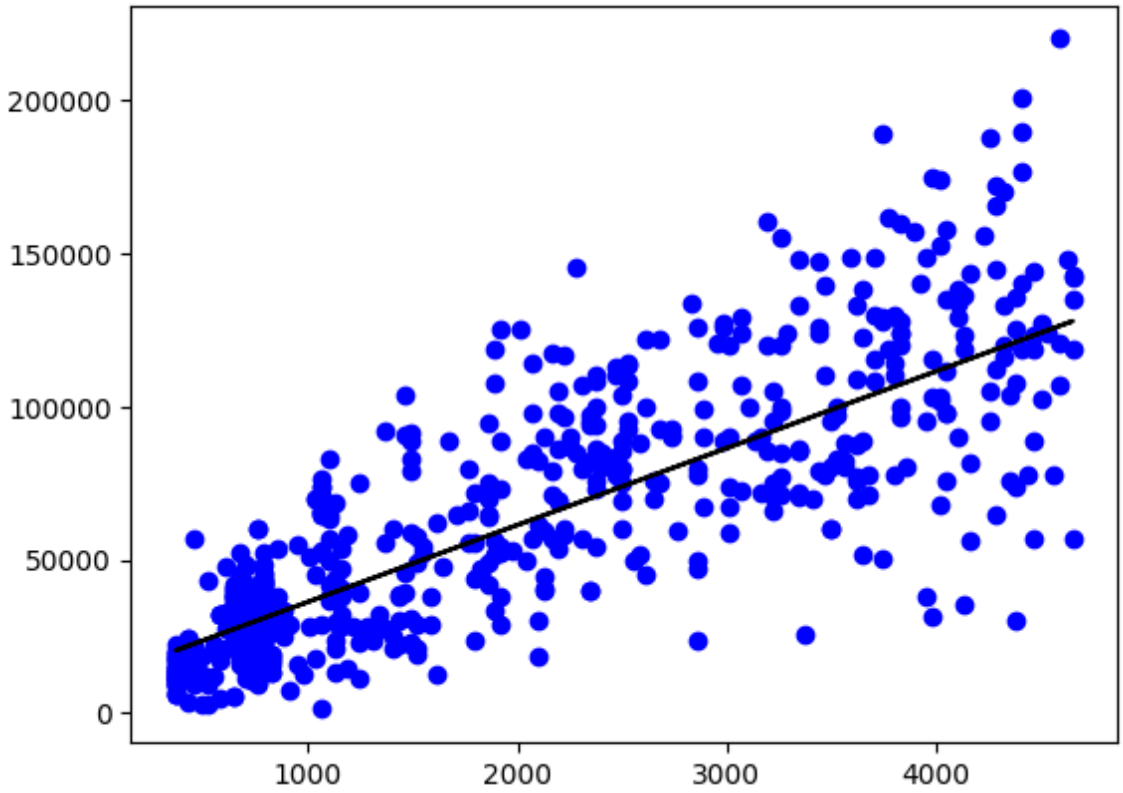
In [11]:

```
x_train,x_test,y_train,y_test=train_test_split(x,y,test_size=0.5)
regr=LinearRegression()
regr.fit(x_train,y_train)
print(regr.score(x_test,y_test))
```

```
0.7081558367418177
```

In [12]:

```
y_pred=regr.predict(x_test)
plt.scatter(x_test,y_test,color='b')
plt.plot(x_test,y_pred,color='black')
plt.show()
```

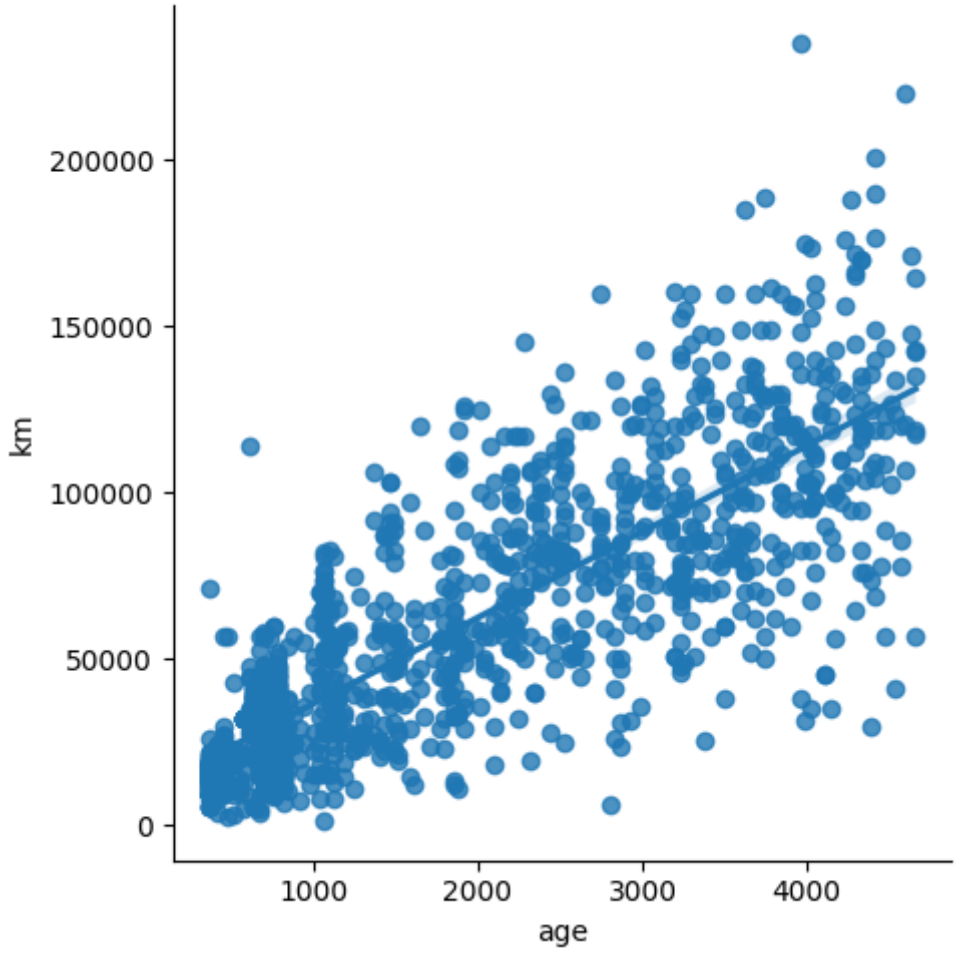


In [15]:

```
df1900=df[:][:1900]
sns.lmplot(x="age",y="km",data=df1900,order=1)
```

Out[15]:

```
<seaborn.axisgrid.FacetGrid at 0x2302048d720>
```



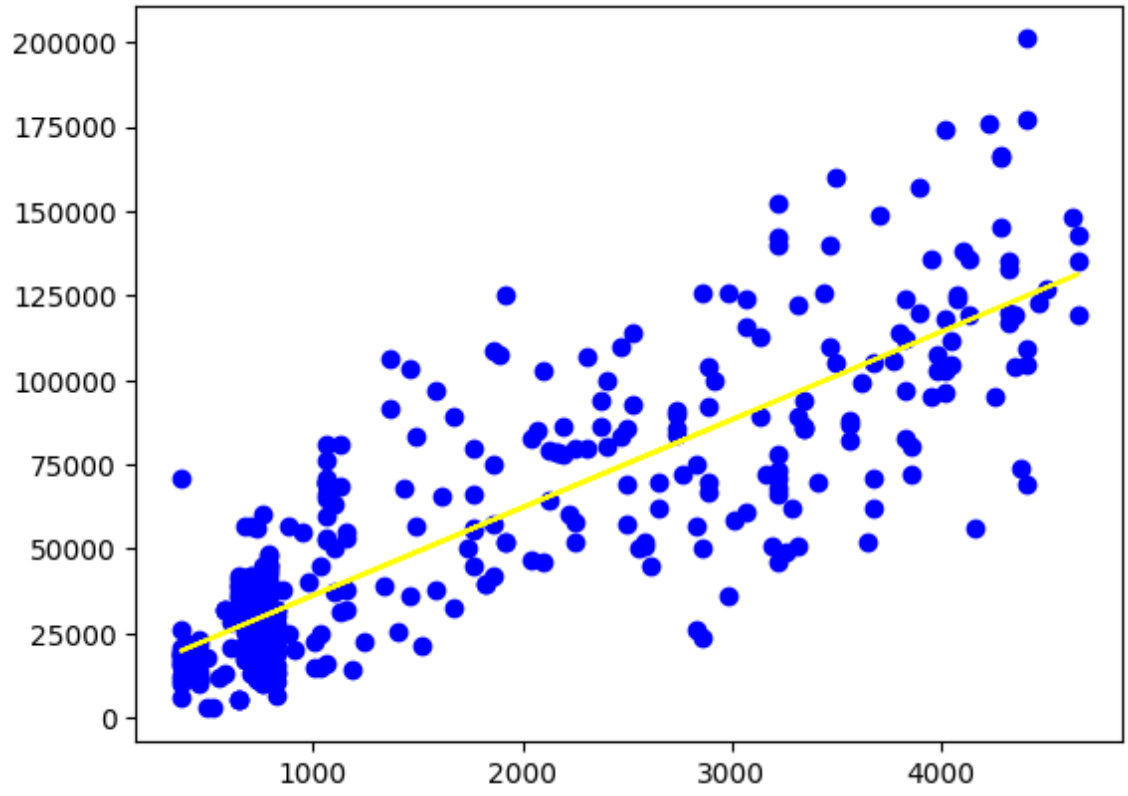
In [16]:

```
df1900.fillna(method='ffill',inplace=True)
x=np.array(df['age']).reshape(-1,1)
y=np.array(df['km']).reshape(-1,1)
df.dropna(inplace=True)
x_train,x_test,y_train,y_test=train_test_split(x,y,test_size=0.25)
regr=LinearRegression()
regr.fit(x_train,y_train)
print("Regression:",regr.score(x_test,y_test))
y_pred=regr.predict(x_test)
plt.scatter(x_test,y_test,color='b')
plt.plot(x_test,y_pred,color='yellow')
plt.show()
```

```
C:\Users\pucha\AppData\Local\Temp\ipykernel_17880\3612251693.py:4: Sett
ingWithCopyWarning:
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#returning-a-view-versus-a-copy (ht
tps://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#ret
urning-a-view-versus-a-copy)
  df.dropna(inplace=True)
```

```
Regression: 0.7115326258136627
```



In [17]:

```
from sklearn.linear_model import LinearRegression
from sklearn.metrics import r2_score
model=LinearRegression()
model.fit(x_train,y_train)
y_pred=model.predict(x_test)
r2=r2_score(y_test,y_pred)
print("R2_score:",r2)
```

```
R2_score: 0.7115326258136627
```

In [ ]:

```

```