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\thara\Downloads\fiat500_VehicleSelection_Dataset (2).csv")
df
```

Out[2]:

	ID	model	engine_power	age_in_days	km	previous_owners	lat	
0	1	lounge	51	882	25000	1	44.907242	8.611
1	2	pop	51	1186	32500	1	45.666359	12.241
2	3	sport	74	4658	142228	1	45.503300	11.417
3	4	lounge	51	2739	160000	1	40.633171	17.634
4	5	pop	73	3074	106880	1	41.903221	12.495
...	...	...	...	...	...	...	...	
1533	1534	sport	51	3712	115280	1	45.069679	7.704
1534	1535	lounge	74	3835	112000	1	45.845692	8.666
1535	1536	pop	51	2223	60457	1	45.481541	9.413
1536	1537	lounge	51	2557	80750	1	45.000702	7.682
1537	1538	pop	51	1766	54276	1	40.323410	17.568

1538 rows × 9 columns

In [5]:

```
df = df[['age_in_days','price']]
#Taking only selected two attributes from dataset
df.columns = ['age_in_days','price']
```

In [6]:

```
df.head()
```

Out[6]:

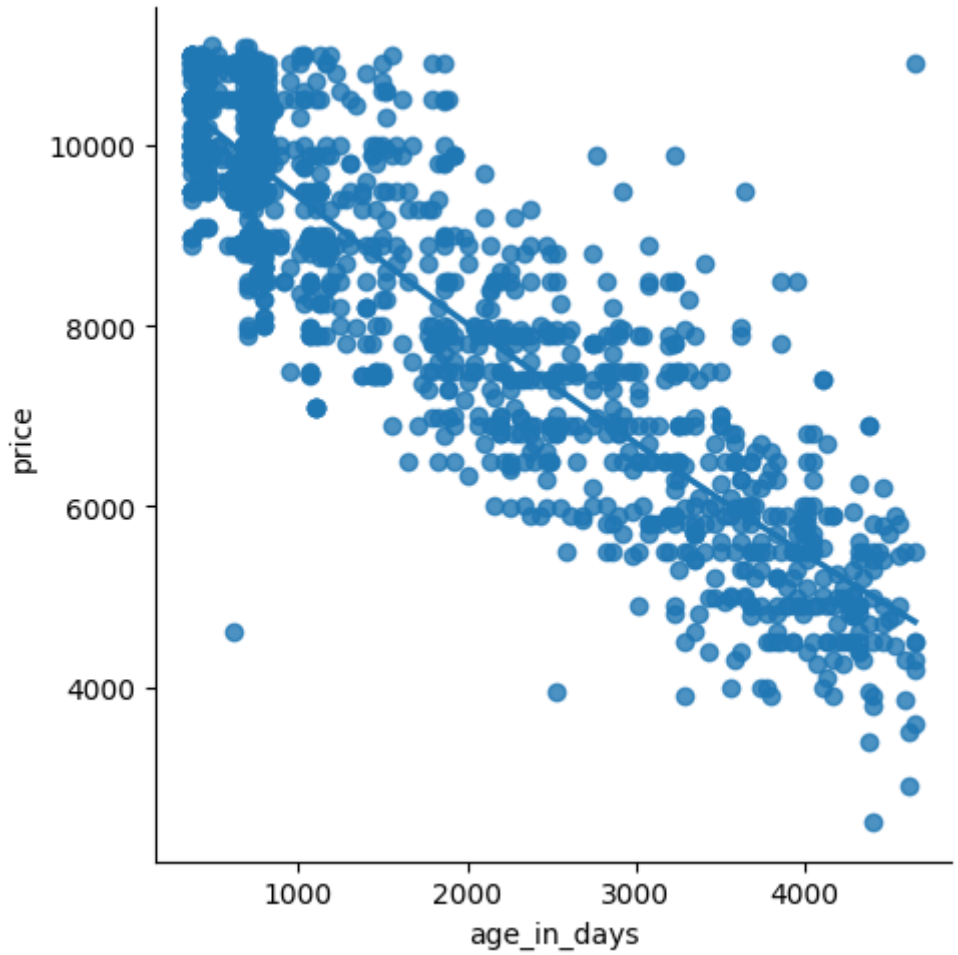
	age_in_days	price
0	882	8900
1	1186	8800
2	4658	4200
3	2739	6000
4	3074	5700

In [7]:

```
#Step-3: Exploring the Data Scatter - plotting the data scatter
sns.lmplot(x="age_in_days",y="price",data=df,order=2,ci=None)
```

Out[7]:

```
<seaborn.axisgrid.FacetGrid at 0x21dbafb6a50>
```



In [8]:

```
#step 4: Dta cleaning - eliminating NON and missing input numbers
df.fillna(method='ffill',inplace=True)
```

```
C:\Users\smb06\AppData\Local\Temp\ipykernel_2788\477090421.py:2: SettingWi
thCopyWarning:
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-doc
s/stable/user_guide/indexing.html#returning-a-view-versus-a-copy (https://
pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-
view-versus-a-copy)
  df.fillna(method='ffill',inplace=True)
```

In [11]:

```
#step 5:Training our model
X=np.array(df['age_in_days']).reshape(-1, 1)
y=np.array(df['price']).reshape(-1, 1)
#separating the data into independent and dependent variables and convert
#how each dataframe contains only one coloumn
```

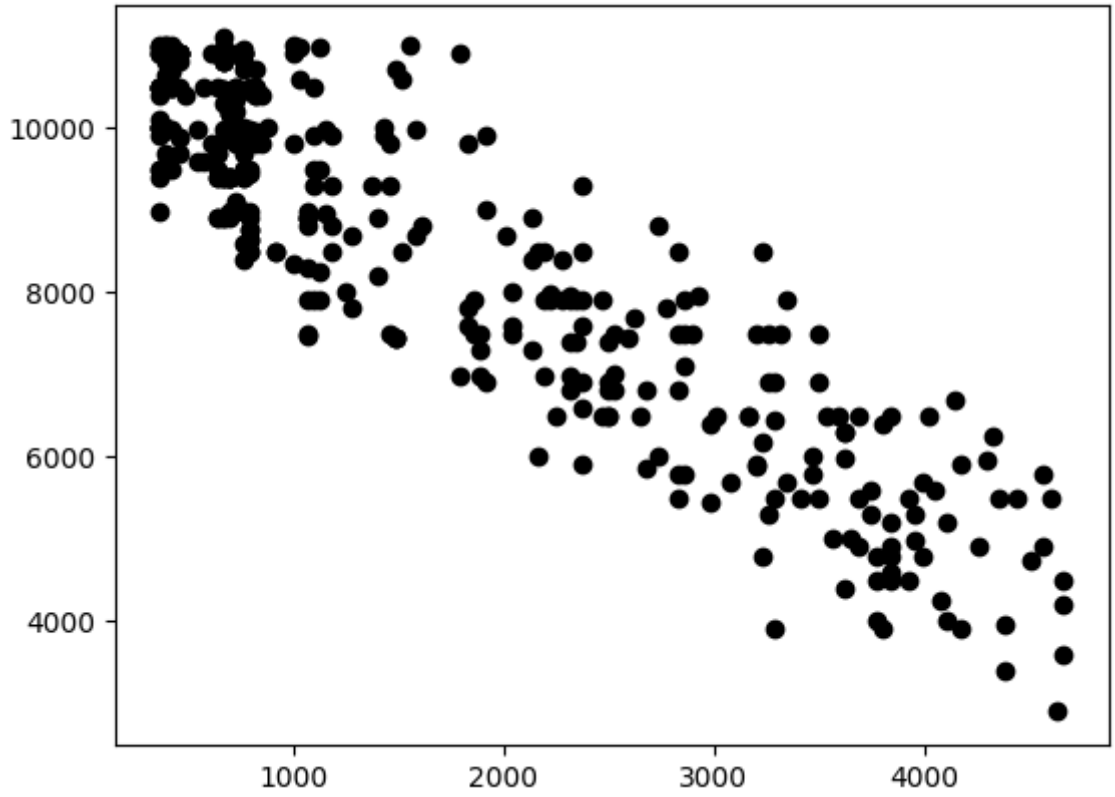
In [12]:

```
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))
```

```
0.824718937325458
```

In [13]:

```
#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
```

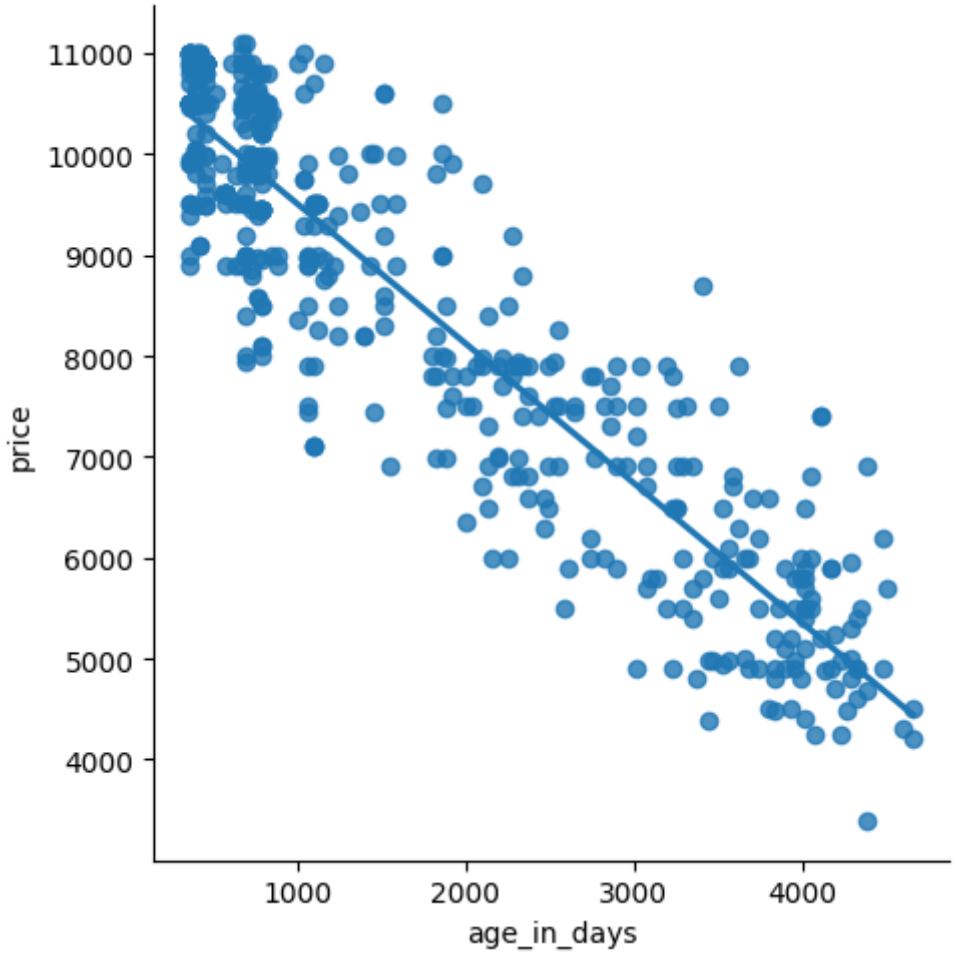


In [14]:

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

Out[14]:

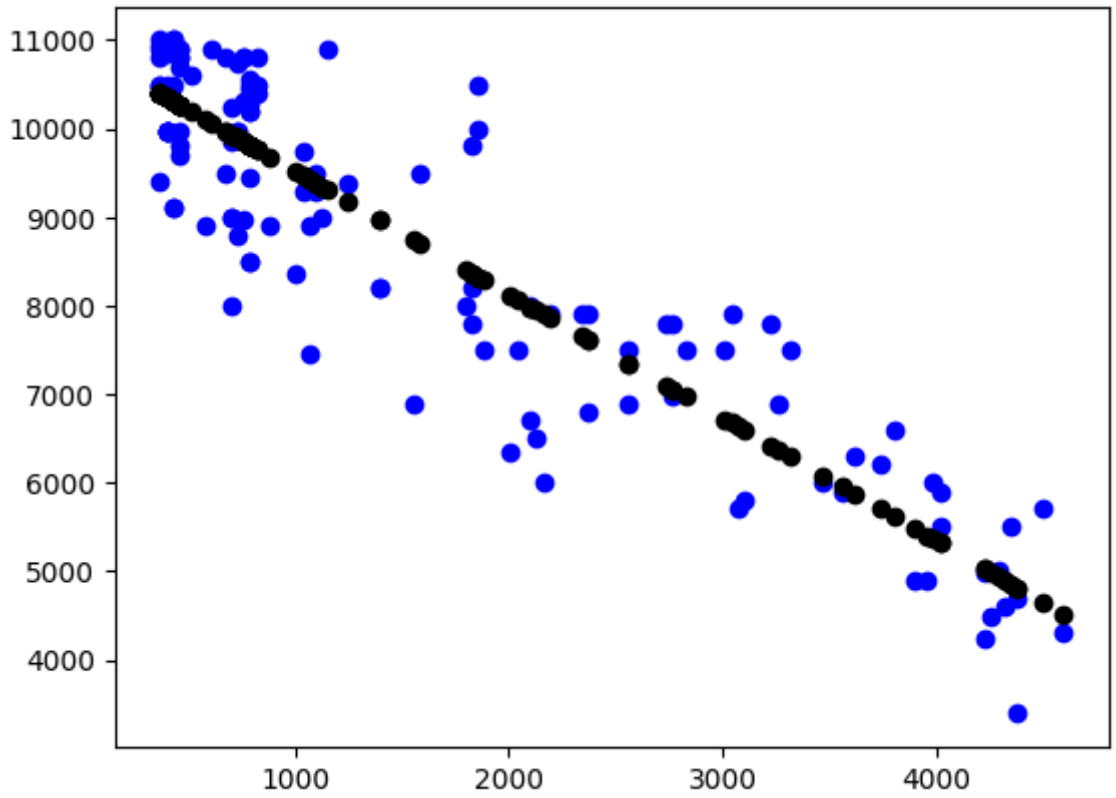
```
<seaborn.axisgrid.FacetGrid at 0x21dbba8bc50>
```



In [15]:

```
df500.fillna(method = 'ffill', inplace = True)
X = np.array(df500['age_in_days']).reshape(-1, 1)
y = np.array(df500['price']).reshape(-1, 1)
df500.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.scatter(X_test, y_pred, color = 'k')
plt.show()
```

```
Regression: 0.8313697991061803
```



In [16]:

```
#Step-8: Evaluation of model

from sklearn.linear_model import LinearRegression

from sklearn.metrics import r2_score

#Train the model

model = LinearRegression()

model.fit(X_train, y_train)

#Evaluating the model on the test set

y_pred = model.predict(X_test)

r2 = r2_score(y_test, y_pred)

print("R2 score:",r2)
```

```
R2 score: 0.8313697991061803
```

In [ ]:

```
#step9:conclusion
Dataset we have taken is poor for Linear Model,but with the smaller data works well with
```