In [19]:
```
import pandas as pd
```

In [20]:
```
data=pd.read_csv("/home/placement/Downloads/fiat500(1).csv")
```

In [21]:
```
data.describe
```

Out[21]:
```
<bound method NDFrame.describe of         ID   model  engine_power  age_in_days      km  previous_owners
\
0        1  lounge            51          882   25000                1
1        2     pop            51         1186   32500                1
2        3   sport            74         4658  142228                1
3        4  lounge            51         2739  160000                1
4        5     pop            73         3074  106880                1
...    ...     ...           ...          ...     ...              ...
1533  1534   sport            51         3712  115280                1
1534  1535  lounge            74         3835  112000                1
1535  1536     pop            51         2223   60457                1
1536  1537  lounge            51         2557   80750                1
1537  1538     pop            51         1766   54276                1

            lat        lon  price
0     44.907242   8.611560   8900
1     45.666359  12.241890   8800
2     45.503300  11.417840   4200
3     40.633171  17.634609   6000
4     41.903221  12.495650   5700
...         ...        ...    ...
1533  45.069679   7.704920   5200
1534  45.845692   8.666870   4600
1535  45.481541   9.413480   7500
1536  45.000702   7.682270   5990
1537  40.323410  17.568270   7900

[1538 rows x 9 columns]>
```

In [22]:
```
data.tail(10)
```

Out[22]:

	ID	model	engine_power	age_in_days	km	previous_owners	lat	lon	price
1528	1529	lounge	51	2861	126000	1	43.841980	10.51531	5500
1529	1530	lounge	51	731	22551	1	38.122070	13.36112	9900
1530	1531	lounge	51	670	29000	1	45.764648	8.99450	10800
1531	1532	sport	73	4505	127000	1	45.528511	9.59323	4750
1532	1533	pop	51	1917	52008	1	45.548000	11.54947	9900
1533	1534	sport	51	3712	115280	1	45.069679	7.70492	5200
1534	1535	lounge	74	3835	112000	1	45.845692	8.66687	4600
1535	1536	pop	51	2223	60457	1	45.481541	9.41348	7500
1536	1537	lounge	51	2557	80750	1	45.000702	7.68227	5990
1537	1538	pop	51	1766	54276	1	40.323410	17.56827	7900

In [ ]:

In [ ]:

In [ ]:

In [23]:
```
data.tail(10)
```

Out[23]:

	ID	model	engine_power	age_in_days	km	previous_owners	lat	lon	price
1528	1529	lounge	51	2861	126000	1	43.841980	10.51531	5500
1529	1530	lounge	51	731	22551	1	38.122070	13.36112	9900
1530	1531	lounge	51	670	29000	1	45.764648	8.99450	10800
1531	1532	sport	73	4505	127000	1	45.528511	9.59323	4750
1532	1533	pop	51	1917	52008	1	45.548000	11.54947	9900
1533	1534	sport	51	3712	115280	1	45.069679	7.70492	5200
1534	1535	lounge	74	3835	112000	1	45.845692	8.66687	4600
1535	1536	pop	51	2223	60457	1	45.481541	9.41348	7500
1536	1537	lounge	51	2557	80750	1	45.000702	7.68227	5990
1537	1538	pop	51	1766	54276	1	40.323410	17.56827	7900

In [24]:
```
data.head(10)
```

Out[24]:

	ID	model	engine_power	age_in_days	km	previous_owners	lat	lon	price
0	1	lounge	51	882	25000	1	44.907242	8.611560	8900
1	2	pop	51	1186	32500	1	45.666359	12.241890	8800
2	3	sport	74	4658	142228	1	45.503300	11.417840	4200
3	4	lounge	51	2739	160000	1	40.633171	17.634609	6000
4	5	pop	73	3074	106880	1	41.903221	12.495650	5700
5	6	pop	74	3623	70225	1	45.000702	7.682270	7900
6	7	lounge	51	731	11600	1	44.907242	8.611560	10750
7	8	lounge	51	1521	49076	1	41.903221	12.495650	9190
8	9	sport	73	4049	76000	1	45.548000	11.549470	5600
9	10	sport	51	3653	89000	1	45.438301	10.991700	6000

In [25]:
```
data['model'].unique()
```

Out[25]:
```
array(['lounge', 'pop', 'sport'], dtype=object)
```

In [26]:
```
data['price'].unique()
```

Out[26]:
```
array([ 8900,  8800,  4200,  6000,  5700,  7900, 10750,  9190,  5600,
        8950, 10990,  9700,  4800,  9300,  9500,  5250,  7990,  7300,
       10500,  6990, 10600, 10200,  9990, 10800,  6800,  4950, 10640,
        5900,  5200,  9790,  5000,  8990,  7200,  9950,  9000,  4890,
       10900,  5999, 10400,  7500,  4900,  4300,  6999,  5990,  5500,
        7450,  8250,  9800,  9900,  4490,  7400, 10700,  7800, 10050,
        4799,  8100,  5800,  9390,  7490,  9970,  8980, 10465,  5950,
        8500,  8790, 10000,  9400,  6100,  6500, 10650, 10950, 11000,
        7700,  6300, 10250,  4990,  8200, 10550,  6900,  6700,  9490,
       10279, 11090,  8000,  5400,  8700, 10280,  4500,  4250,  9450,
        9590,  9600,  5399, 10670,  5300, 10850,  7600,  5100,  6600,
        9435, 10300,  4390,  8390, 10470,  3390,  9980,  9850,  5490,
        7950,  9750,  4600, 10999,  9100,  6200,  8400,  8750,  8290,
        7100,  9999,  8999,  5699,  8579,  6350,  8600,  9979,  8580,
        9499, 10450, 10590,  4690,  6599,  4400,  9200,  8850,  4700,
        8350,  6490,  7999,  8899,  7000,  6400,  8300,  4450, 10490,
        8499, 10499,  9480,  5850,  7480,  6290,  8450,  4299,  4399,
       10790,  7590,  9899,  9840,  9890,  4790,  9290,  6699,  4999,
       11100,  8650,  5499,  5880,  6499, 10870, 10690,  7495,  5799,
       10100,  5450, 10350,  3990,  8190,  6190, 10390,  7390,  7790,
       10399,  3500,  3600,  8399,  6890,  2500,  7190,  7380,  3900,
        9780,  9879,  7699,  9550,  7885, 10180,  3800,  9699,  7479,
        5790,  6250,  7350,  9299,  8490,  8799, 10890,  7799,  3950,
        6790,  4000,  5550,  6450,  9690,  6799,  2900,  6950,  5199,
        8890,  8979,  3850,  5290,  4100,  4750])
```

In [27]:
```
list(data.columns)
```

Out[27]:
```
['ID',
 'model',
 'engine_power',
 'age_in_days',
 'km',
 'previous_owners',
 'lat',
 'lon',
 'price']
```

In [28]:
```
list(data.columns[3])
```

Out[28]:
```
['a', 'g', 'e', '_', 'i', 'n', '_', 'd', 'a', 'y', 's']
```

In [ ]:

In [ ]:

In [ ]:

In [ ]:

In [29]:
```
data.groupby(['previous_owners']).count()
```

Out[29]:

previous_owners	ID	model	engine_power	age_in_days	km	lat	lon	price
1	1389	1389	1389	1389	1389	1389	1389	1389
2	117	117	117	117	117	117	117	117
3	23	23	23	23	23	23	23	23
4	9	9	9	9	9	9	9	9

In [30]:
```
data.groupby(['model']).count()
```

Out[30]:

model	ID	engine_power	age_in_days	km	previous_owners	lat	lon	price
lounge	1094	1094	1094	1094	1094	1094	1094	1094
pop	358	358	358	358	358	358	358	358
sport	86	86	86	86	86	86	86	86

In [32]:
```
data1=data.drop(['lat','ID'],axis=1)
```

In [33]:
```
data1=data.drop(['lat','ID'],axis=1)
```

In [ ]:
```

```

In [34]:
```
data1.head()
```

Out[34]:

	model	engine_power	age_in_days	km	previous_owners	lon	price
0	lounge	51	882	25000	1	8.611560	8900
1	pop	51	1186	32500	1	12.241890	8800
2	sport	74	4658	142228	1	11.417840	4200
3	lounge	51	2739	160000	1	17.634609	6000
4	pop	73	3074	106880	1	12.495650	5700

In [35]:
```
data['price'].sum()
```

Out[35]:
```
13189894
```

In [36]:
```
data2=data.loc[(data.model=='longe')]
data2
```

Out[36]:

ID	model	engine_power	age_in_days	km	previous_owners	lat	lon	price

In [ ]:
```

```

In [37]:
```
data2=data.loc[(data.model=='lounge')]
data2
```

Out[37]:

	ID	model	engine_power	age_in_days	km	previous_owners	lat	lon	price
0	1	lounge	51	882	25000	1	44.907242	8.611560	8900
3	4	lounge	51	2739	160000	1	40.633171	17.634609	6000
6	7	lounge	51	731	11600	1	44.907242	8.611560	10750
7	8	lounge	51	1521	49076	1	41.903221	12.495650	9190
11	12	lounge	51	366	17500	1	45.069679	7.704920	10990
...	...	...	...	...	...	...	...	...	...
1528	1529	lounge	51	2861	126000	1	43.841980	10.515310	5500
1529	1530	lounge	51	731	22551	1	38.122070	13.361120	9900
1530	1531	lounge	51	670	29000	1	45.764648	8.994500	10800
1534	1535	lounge	74	3835	112000	1	45.845692	8.666870	4600
1536	1537	lounge	51	2557	80750	1	45.000702	7.682270	5990

1094 rows × 9 columns

In [38]:
```
data2=data.loc[(data.model=='km')]
data2
```

Out[38]:

	ID	model	engine_power	age_in_days	km	previous_owners	lat	lon	price

In [39]:
```
data2=data.loc[(data.km<=25000)]
data2
```

Out[39]:

	ID	model	engine_power	age_in_days	km	previous_owners	lat	lon	price
0	1	lounge	51	882	25000	1	44.907242	8.61156	8900
6	7	lounge	51	731	11600	1	44.907242	8.61156	10750
11	12	lounge	51	366	17500	1	45.069679	7.70492	10990
12	13	lounge	51	456	18450	1	45.426571	11.78813	9700
19	20	lounge	51	425	20030	1	45.354389	11.86926	10500
...	...	...	...	...	...	...	...	...	...
1520	1521	lounge	51	1035	15000	1	41.903221	12.49565	10990
1522	1523	lounge	51	366	14618	1	45.707249	11.47760	10500
1526	1527	lounge	51	1705	23600	1	38.122070	13.36112	9300
1527	1528	pop	51	517	3000	1	40.748241	14.52835	9999
1529	1530	lounge	51	731	22551	1	38.122070	13.36112	9900

492 rows × 9 columns

In [ ]:

In [40]:
```
data2=data.loc[(data.model=='pop')&(data.previous_owners==1)]
data2
```

Out[40]:

	ID	model	engine_power	age_in_days	km	previous_owners	lat	lon	price
1	2	pop	51	1186	32500	1	45.666359	12.241890	8800
4	5	pop	73	3074	106880	1	41.903221	12.495650	5700
5	6	pop	74	3623	70225	1	45.000702	7.682270	7900
10	11	pop	51	790	43286	1	40.871429	14.438960	8950
13	14	pop	51	3835	120000	1	40.531590	17.436159	4800
...	...	...	...	...	...	...	...	...	...
1524	1525	pop	51	2192	53300	1	40.609531	14.980930	7900
1527	1528	pop	51	517	3000	1	40.748241	14.528350	9999
1532	1533	pop	51	1917	52008	1	45.548000	11.549470	9900
1535	1536	pop	51	2223	60457	1	45.481541	9.413480	7500
1537	1538	pop	51	1766	54276	1	40.323410	17.568270	7900

327 rows × 9 columns

In [41]:
```
data2.iloc[10]
```

Out[41]:
```
ID                      42
model                  pop
engine_power            51
age_in_days            609
km                   28500
previous_owners          1
lat               45.746021
lon                9.04997
price                10900
Name: 41, dtype: object
```

In [ ]:

In [ ]:

In [42]:
```
data2=data.loc[(data.model=='pop')^(data.model=='launge')]
data2
```

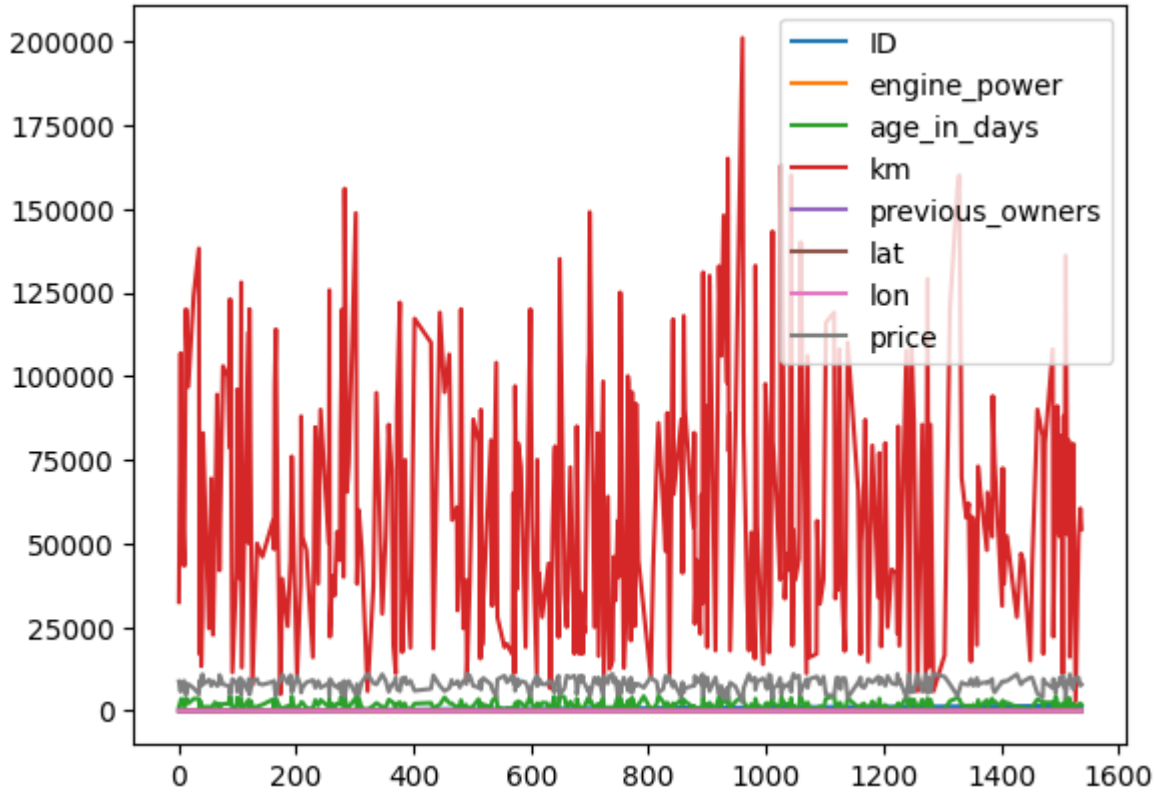
Out[42]:

	ID	model	engine_power	age_in_days	km	previous_owners	lat	lon	price
1	2	pop	51	1186	32500	1	45.666359	12.241890	8800
4	5	pop	73	3074	106880	1	41.903221	12.495650	5700
5	6	pop	74	3623	70225	1	45.000702	7.682270	7900
10	11	pop	51	790	43286	1	40.871429	14.438960	8950
13	14	pop	51	3835	120000	1	40.531590	17.436159	4800
...	...	...	...	...	...	...	...	...	...
1524	1525	pop	51	2192	53300	1	40.609531	14.980930	7900
1527	1528	pop	51	517	3000	1	40.748241	14.528350	9999
1532	1533	pop	51	1917	52008	1	45.548000	11.549470	9900
1535	1536	pop	51	2223	60457	1	45.481541	9.413480	7500
1537	1538	pop	51	1766	54276	1	40.323410	17.568270	7900

358 rows × 9 columns

In [44]:
```
data2=data.loc[(data.model=='pop')|(data.model=='launge')]
data2
data2.plot()
```

Out[44]: <Axes: >



In [45]:
```
data2[1:13]
```

Out[45]:

	ID	model	engine_power	age_in_days	km	previous_owners	lat	lon	price
4	5	pop	73	3074	106880	1	41.903221	12.495650	5700
5	6	pop	74	3623	70225	1	45.000702	7.682270	7900
10	11	pop	51	790	43286	1	40.871429	14.438960	8950
13	14	pop	51	3835	120000	1	40.531590	17.436159	4800
17	18	pop	51	2223	96848	1	43.782372	11.254990	7990
26	27	pop	51	3592	124000	1	40.966179	17.116480	6800
35	36	pop	51	3653	138116	2	40.633171	17.634609	5000
36	37	pop	51	852	17000	1	45.505161	8.939100	8990
37	38	pop	51	3013	58527	1	45.688259	8.731450	7200
39	40	pop	51	1858	13373	1	41.903221	12.495650	9000
41	42	pop	51	609	28500	1	45.746021	9.049970	10900
42	43	pop	51	1096	83000	1	41.959721	12.798056	7900

In [46]:
```
import pandas as pd
```

In [47]:
```
data9=pd.read_csv("/home/placement/Downloads/fiat500(1).csv")
```

In [48]:
```
data9
```

Out[48]:

	ID	model	engine_power	age_in_days	km	previous_owners	lat	lon	price
0	1	lounge	51	882	25000	1	44.907242	8.611560	8900
1	2	pop	51	1186	32500	1	45.666359	12.241890	8800
2	3	sport	74	4658	142228	1	45.503300	11.417840	4200
3	4	lounge	51	2739	160000	1	40.633171	17.634609	6000
4	5	pop	73	3074	106880	1	41.903221	12.495650	5700
...	...	...	...	...	...	...	...	...	...
1533	1534	sport	51	3712	115280	1	45.069679	7.704920	5200
1534	1535	lounge	74	3835	112000	1	45.845692	8.666870	4600
1535	1536	pop	51	2223	60457	1	45.481541	9.413480	7500
1536	1537	lounge	51	2557	80750	1	45.000702	7.682270	5990
1537	1538	pop	51	1766	54276	1	40.323410	17.568270	7900

1538 rows × 9 columns

In [49]:
```
data9['model']=data9['model'].map({'lounge':1,'pop':2,'sport':3})
```

In [50]:
```
data9
```

Out[50]:

	ID	model	engine_power	age_in_days	km	previous_owners	lat	lon	price
0	1	1	51	882	25000	1	44.907242	8.611560	8900
1	2	2	51	1186	32500	1	45.666359	12.241890	8800
2	3	3	74	4658	142228	1	45.503300	11.417840	4200
3	4	1	51	2739	160000	1	40.633171	17.634609	6000
4	5	2	73	3074	106880	1	41.903221	12.495650	5700
...	...	...	...	...	...	...	...	...	...
1533	1534	3	51	3712	115280	1	45.069679	7.704920	5200
1534	1535	1	74	3835	112000	1	45.845692	8.666870	4600
1535	1536	2	51	2223	60457	1	45.481541	9.413480	7500
1536	1537	1	51	2557	80750	1	45.000702	7.682270	5990
1537	1538	2	51	1766	54276	1	40.323410	17.568270	7900

1538 rows × 9 columns

In [51]:
```
data9.head()
```

Out[51]:

	ID	model	engine_power	age_in_days	km	previous_owners	lat	lon	price
0	1	1	51	882	25000	1	44.907242	8.611560	8900
1	2	2	51	1186	32500	1	45.666359	12.241890	8800
2	3	3	74	4658	142228	1	45.503300	11.417840	4200
3	4	1	51	2739	160000	1	40.633171	17.634609	6000
4	5	2	73	3074	106880	1	41.903221	12.495650	5700

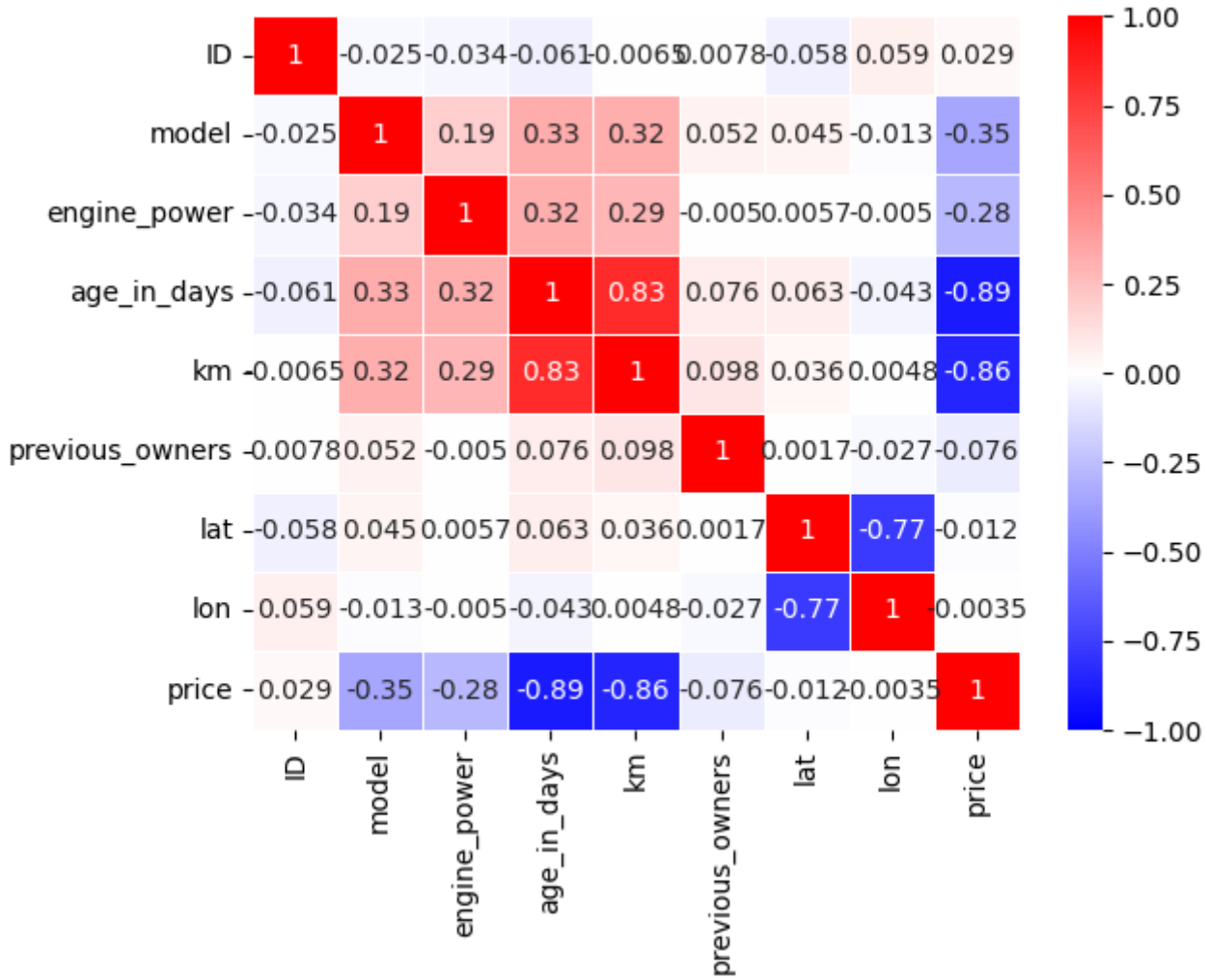
In [52]:
```
cor_mat=data9.corr()
cor_mat
```

Out[52]:

	ID	model	engine_power	age_in_days	km	previous_owners	lat	lon	price
ID	1.000000	-0.024740	-0.034059	-0.060753	-0.006537	0.007803	-0.058207	0.058941	0.028516
model	-0.024740	1.000000	0.189906	0.326508	0.319580	0.052480	0.044901	-0.013200	-0.349885
engine_power	-0.034059	0.189906	1.000000	0.319190	0.285495	-0.005030	0.005721	-0.005032	-0.277235
age_in_days	-0.060753	0.326508	0.319190	1.000000	0.833890	0.075775	0.062982	-0.042667	-0.893328
km	-0.006537	0.319580	0.285495	0.833890	1.000000	0.097539	0.035519	0.004839	-0.859373
previous_owners	0.007803	0.052480	-0.005030	0.075775	0.097539	1.000000	0.001697	-0.026836	-0.076274
lat	-0.058207	0.044901	0.005721	0.062982	0.035519	0.001697	1.000000	-0.766646	-0.011733
lon	0.058941	-0.013200	-0.005032	-0.042667	0.004839	-0.026836	-0.766646	1.000000	-0.003541
price	0.028516	-0.349885	-0.277235	-0.893328	-0.859373	-0.076274	-0.011733	-0.003541	1.000000

In [53]:
```
import seaborn as sns
sns.heatmap(cor_mat,vmax=1,vmin=-1,annot=True,linewidths=.5,cmap='bwr')
```

Out[53]: <Axes: >



In [ ]: