DMV4 Data Wrangling

October 26, 2023

[1]:
```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
from sklearn.preprocessing import LabelEncoder

df = pd.read_csv("C:/Users/hp/Downloads/Practical_Data/Housing.csv")
df.head()
```

```
C:\Users\hp\anaconda3\lib\site-packages\scipy\__init__.py:146: UserWarning: A
NumPy version >=1.16.5 and <1.23.0 is required for this version of SciPy
(detected version 1.25.2
  warnings.warn(f"A NumPy version >={np_minversion} and <{np_maxversion}"
```

[1]:
```
      price  area  bedrooms  bathrooms  stories mainroad guestroom basement  \
0  13300000  7420         4          2        3      yes        no       no
1  12250000  8960         4          4        4      yes        no       no
2  12250000  9960         3          2        2      yes        no      yes
3  12215000  7500         4          2        2      yes        no      yes
4  11410000  7420         4          1        2      yes       yes      yes

  hotwaterheating airconditioning  parking prefarea furnishingstatus
0              no             yes        2      yes        furnished
1              no             yes        3       no        furnished
2              no              no        2      yes   semi-furnished
3              no             yes        3      yes        furnished
4              no             yes        2       no        furnished
```

[2]:
```
df.isna().sum()
```

[2]:
```
price               0
area                0
bedrooms            0
bathrooms           0
stories             0
mainroad            0
guestroom           0
basement            0
```

```
hotwaterheating     0
airconditioning     0
parking             0
prefarea            0
furnishingstatus    0
dtype: int64
```

[3]:

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 545 entries, 0 to 544
Data columns (total 13 columns):
 #   Column            Non-Null Count  Dtype
---  ------            --------------  -----
 0   price             545 non-null    int64
 1   area              545 non-null    int64
 2   bedrooms          545 non-null    int64
 3   bathrooms         545 non-null    int64
 4   stories           545 non-null    int64
 5   mainroad          545 non-null    object
 6   guestroom         545 non-null    object
 7   basement          545 non-null    object
 8   hotwaterheating   545 non-null    object
 9   airconditioning   545 non-null    object
 10  parking           545 non-null    int64
 11  prefarea          545 non-null    object
 12  furnishingstatus  545 non-null    object
dtypes: int64(6), object(7)
memory usage: 55.5+ KB
```

[4]:

```
df.describe()
```

[4]:

```
              price          area    bedrooms   bathrooms     stories  \
count  5.450000e+02    545.000000  545.000000  545.000000  545.000000
mean   4.766729e+06   5150.541284    2.965138    1.286239    1.805505
std    1.870440e+06   2170.141023    0.738064    0.502470    0.867492
min    1.750000e+06   1650.000000    1.000000    1.000000    1.000000
25%    3.430000e+06   3600.000000    2.000000    1.000000    1.000000
50%    4.340000e+06   4600.000000    3.000000    1.000000    2.000000
75%    5.740000e+06   6360.000000    3.000000    2.000000    2.000000
max    1.330000e+07  16200.000000    6.000000    4.000000    4.000000

          parking
count  545.000000
mean     0.693578
std      0.861586
min      0.000000
25%      0.000000
```

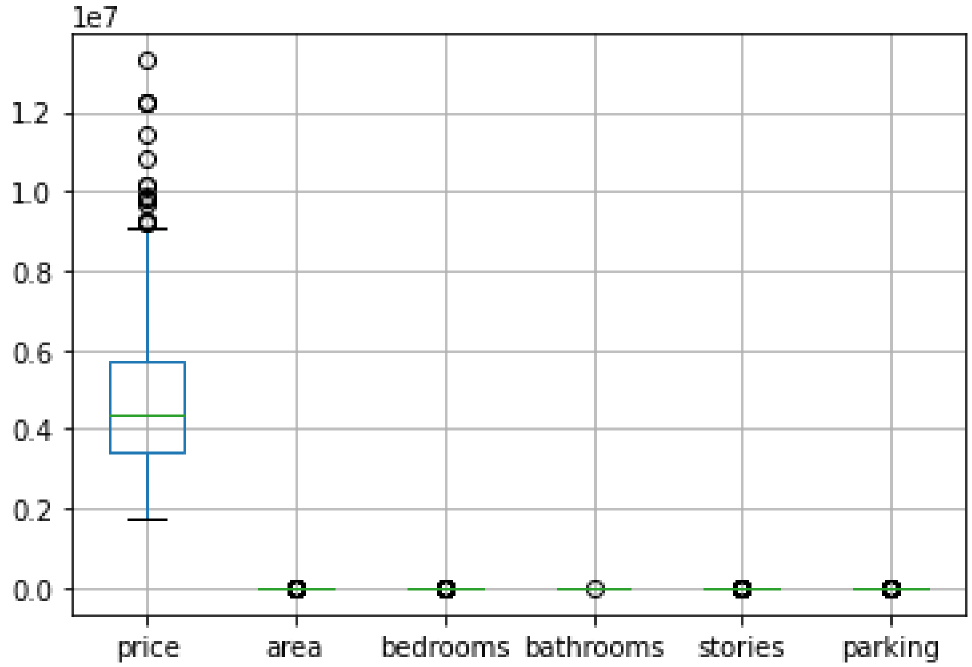
```
50%      0.000000
75%      1.000000
max      3.000000
```

[5]:

```
df.boxplot()
```

[5]:

```
<AxesSubplot:>
```



[6]:

```
Q1 = df['price'].quantile(0.25)
Q3 = df['price'].quantile(0.75)
iqr = Q3 - Q1
minm= Q1 - (1.5*iqr)
maxm = Q3 + (1.5*iqr)
df=df[(df['price']>minm) & (df['price']<maxm)]
df.head()
```

[6]:

```
      price  area  bedrooms  bathrooms  stories mainroad guestroom basement  \
15  9100000  6000         4          1        2      yes        no      yes
16  9100000  6600         4          2        2      yes       yes      yes
17  8960000  8500         3          2        4      yes        no       no
18  8890000  4600         3          2        2      yes       yes       no
19  8855000  6420         3          2        2      yes        no       no

   hotwaterheating airconditioning  parking prefarea furnishingstatus
15              no              no        2       no    semi-furnished
```

```
16              no             yes        1      yes      unfurnished
17              no             yes        2       no        furnished
18              no             yes        2       no        furnished
19              no             yes        1      yes   semi-furnished
```

[7]:

```
df.columns
```

[7]:

```
Index(['price', 'area', 'bedrooms', 'bathrooms', 'stories', 'mainroad',
       'guestroom', 'basement', 'hotwaterheating', 'airconditioning',
       'parking', 'prefarea', 'furnishingstatus'],
      dtype='object')
```

[8]:

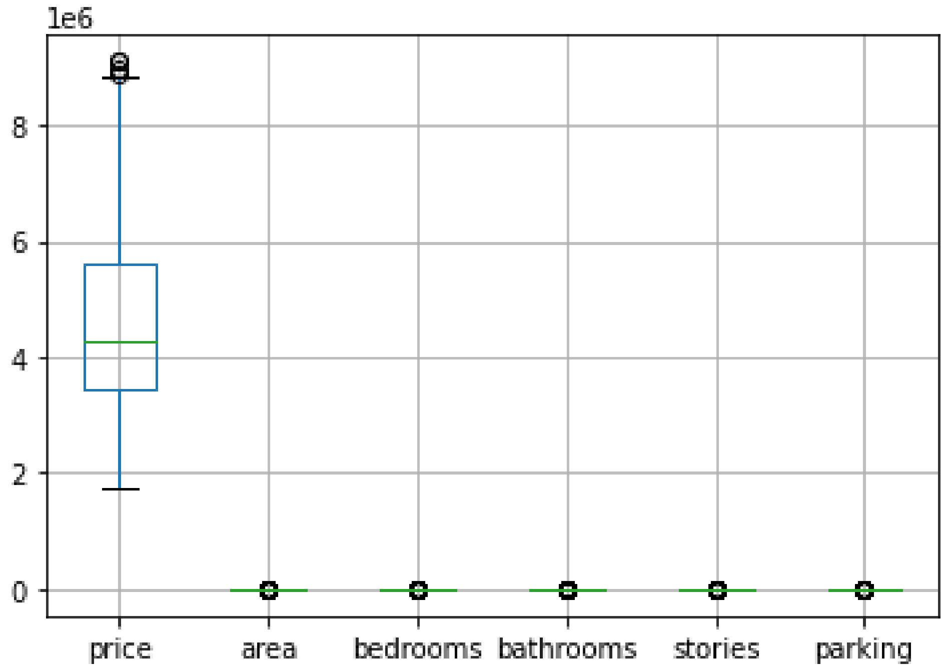
```
df.dtypes
```

[8]:

```
price                int64
area                 int64
bedrooms             int64
bathrooms            int64
stories              int64
mainroad            object
guestroom           object
basement            object
hotwaterheating     object
airconditioning     object
parking              int64
prefarea            object
furnishingstatus    object
dtype: object
```

[9]:

```
df.boxplot()
plt.show()
```



```
[10]: df.head()
```

```
[10]:      price  area  bedrooms  bathrooms  stories mainroad guestroom basement  \
      15  9100000  6000         4          1        2      yes        no      yes
      16  9100000  6600         4          2        2      yes       yes      yes
      17  8960000  8500         3          2        4      yes        no       no
      18  8890000  4600         3          2        2      yes       yes       no
      19  8855000  6420         3          2        2      yes        no       no

         hotwaterheating airconditioning  parking prefarea furnishingstatus
      15              no              no        2       no    semi-furnished
      16              no             yes        1      yes      unfurnished
      17              no             yes        2       no        furnished
      18              no             yes        2       no        furnished
      19              no             yes        1      yes    semi-furnished
```

```
[11]: le = LabelEncoder()
      df['mainroad'] = le.fit_transform(df['mainroad'])
      df['guestroom'] = le.fit_transform(df['guestroom'])
      df['basement'] = le.fit_transform(df['basement'])
      df['hotwaterheating'] = le.fit_transform(df['hotwaterheating'])
      df['airconditioning'] = le.fit_transform(df['airconditioning'])
      df['furnishingstatus'] = le.fit_transform(df['furnishingstatus'])
      df['prefarea'] = le.fit_transform(df['prefarea'])
```

```
df.head()
```

```
[11]:      price  area  bedrooms  bathrooms  stories  mainroad  guestroom  \
      15  9100000  6000         4          1        2         1          0
      16  9100000  6600         4          2        2         1          1
      17  8960000  8500         3          2        4         1          0
      18  8890000  4600         3          2        2         1          1
      19  8855000  6420         3          2        2         1          0

          basement  hotwaterheating  airconditioning  parking  prefarea  \
      15         1                0                0        2         0
      16         1                0                1        1         1
      17         0                0                1        2         0
      18         0                0                1        2         0
      19         0                0                1        1         1

          furnishingstatus
      15                 1
      16                 2
      17                 0
      18                 0
      19                 1
```

```
[ ]:
```