DataPreprocess-Oakland Crime Statistics 2011 to 2016

April 7, 2021

1 Oakland Crime Statistics 2011 to 2016

#3

##3.1 Oakland Crime Statistics 2011 to 201620112016csv2016records-for-2015.csv10AgencyCreate TimeLocationArea IdBeatIncident Type IdIncident Type DescriptionEvent NumberClosed TimePriority 5

```
In [44]: import pandas as pd
         import numpy as np
         from collections import Counter
         import matplotlib.pyplot as plt

         path = 'C:/Users/ZL/Desktop/oakland-crime-statistics-2011-to-2016/records-for-2016.csv
         data = pd.read_csv(path, header=0,  engine='python', encoding='utf-8')
         data = data.values
         print('')
         for i in range(data.shape[1]):  #
             counter = Counter(data[:, i])
             print(counter.most_common(5))  # 5
```

```
[('OP', 110827), (nan, 1)]
[('2016-05-06T11:21:13.000', 3), ('2016-01-01T11:56:04.000', 2), ('2016-01-05T15:14:57.000', 2)
[(' INTERNATIONAL BLVD    ', 2156), (' AV&INTERNATIONAL BLVD    ', 1829), (' MACARTHUR BLVD
[('P3', 47425), ('P1', 41419), ('P2', 19610), ('POU', 2173), ('PCW', 194)]
[('04X', 4515), ('08X', 3931), ('26Y', 3511), ('30Y', 3473), ('19X', 3455)]
[(2.0, 86272), (1.0, 24555), (nan, 1)]
[('933R', 10094), ('415', 7883), ('SECCK', 7251), ('10851', 5308), ('911H', 5089)]
[('ALARM-RINGER', 10094), ('SECURITY CHECK', 7251), ('STOLEN VEHICLE', 5308), ('911 HANG-UP', 5
[('LOP160101000003', 1), ('LOP160101000005', 1), ('LOP160101000008', 1), ('LOP160101000007', 1)
[('2016-05-29T00:43:38.000', 3), ('2016-01-02T20:07:50.000', 2), ('2016-01-03T00:56:37.000', 2)
```

Priority122220

```
In [23]: import pandas as pd
         import numpy as np
```

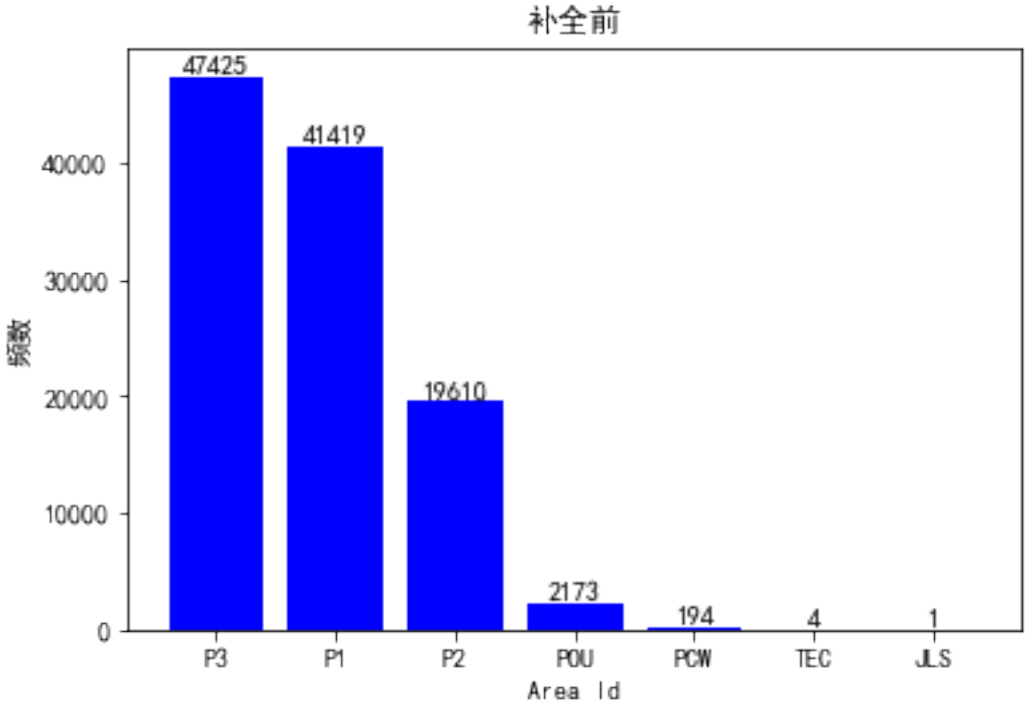
```
        from collections import Counter
        import matplotlib.pyplot as plt

        path = 'C:/Users/ZL/Desktop/oakland-crime-statistics-2011-to-2016/records-for-2016.csv
        data = pd.read_csv(path, header=0, engine='python', encoding='utf-8')
        print(data.describe())  #
```

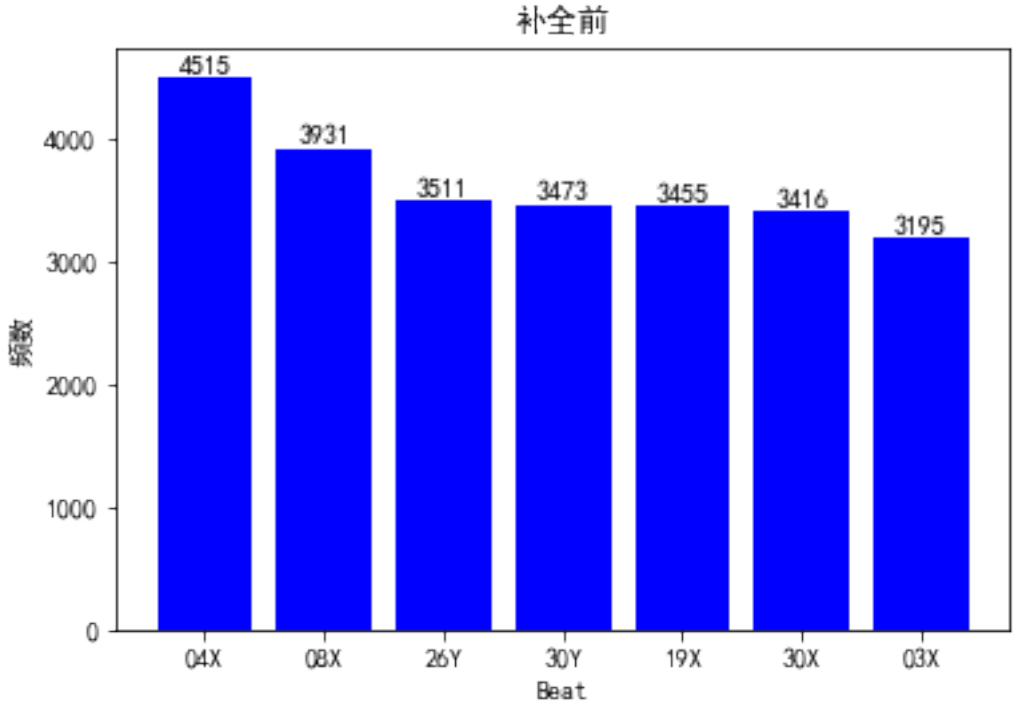
```
            Priority
count  110827.000000
mean        1.778438
std         0.415299
min         1.000000
25%         2.000000
50%         2.000000
75%         2.000000
max         2.000000
```

##1.2 Area IdBeat Area IdBeat

```
In [26]: import pandas as pd
         import numpy as np
         from collections import Counter
         import matplotlib.pyplot as plt
         plt.rcParams['font.sans-serif'] = ['SimHei']
         plt.rcParams['axes.unicode_minus'] = False
         path = 'C:/Users/ZL/Desktop/oakland-crime-statistics-2011-to-2016/records-for-2016.csv

         def draw(data,cl,xlabel):
             num = 7
             data = data.values
             counter = Counter(data[:, cl])
             frequency = counter.most_common()  # n
             num_list = []
             name_list = []
             for i in range(num):
                 num_list.append(int(frequency[i][1]))
                 name_list.append(str(frequency[i][0]))
             fig, ax = plt.subplots()
             b = ax.bar(name_list, num_list)
             plt.bar(range(len(num_list)), num_list, color='blue', tick_label=name_list)
             for a, b in zip(name_list, num_list):
                 ax.text(a, b + 1, b, ha='center', va='bottom')
             plt.title('')
             plt.xlabel(xlabel)
             plt.ylabel('')
             plt.show()
         data = pd.read_csv(path, header=0, engine='python', encoding='utf-8')
```

```
draw(data, 3, 'Area Id')
draw(data, 4, 'Beat')
```

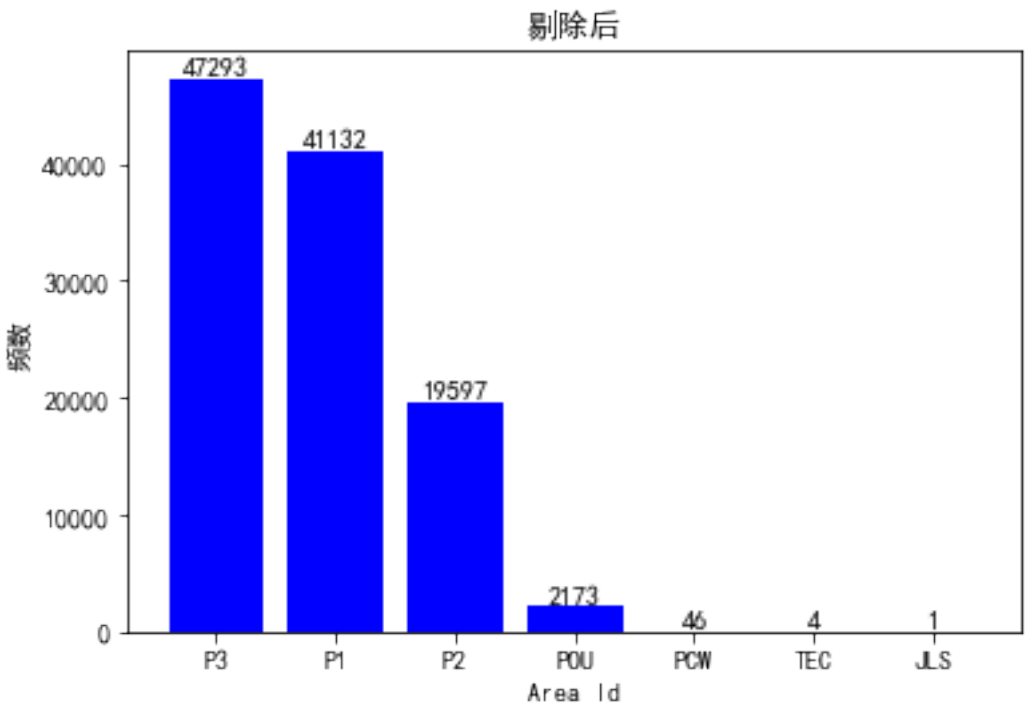




#4 #4.1 39241 Area Id

In [38]:
```
import pandas as pd
import numpy as np
from collections import Counter
import matplotlib.pyplot as plt
plt.rcParams['font.sans-serif'] = ['SimHei']
plt.rcParams['axes.unicode_minus'] = False
path = 'C:/Users/ZL/Desktop/oakland-crime-statistics-2011-to-2016/records-for-2016.csv

def draw(data,cl,xlabel):
    num = 7
    data = data.values
    counter = Counter(data[:, cl])
    frequency = counter.most_common()  # n
    num_list = []
    name_list = []
    for i in range(num):
        num_list.append(int(frequency[i][1]))
        name_list.append(str(frequency[i][0]))
    fig, ax = plt.subplots()
    b = ax.bar(name_list, num_list)
    plt.bar(range(len(num_list)), num_list, color='blue', tick_label=name_list)
    for a, b in zip(name_list, num_list):
        ax.text(a, b + 1, b, ha='center', va='bottom')
    plt.title('')
    plt.xlabel(xlabel)
    plt.ylabel('')
    plt.show()
data = pd.read_csv(path, header=0,  engine='python', encoding='utf-8')
data_drop = data.dropna()  #
print(''+str(data_drop.shape[0]))
draw(data_drop,3,'Area Id')
```

```
110247
```

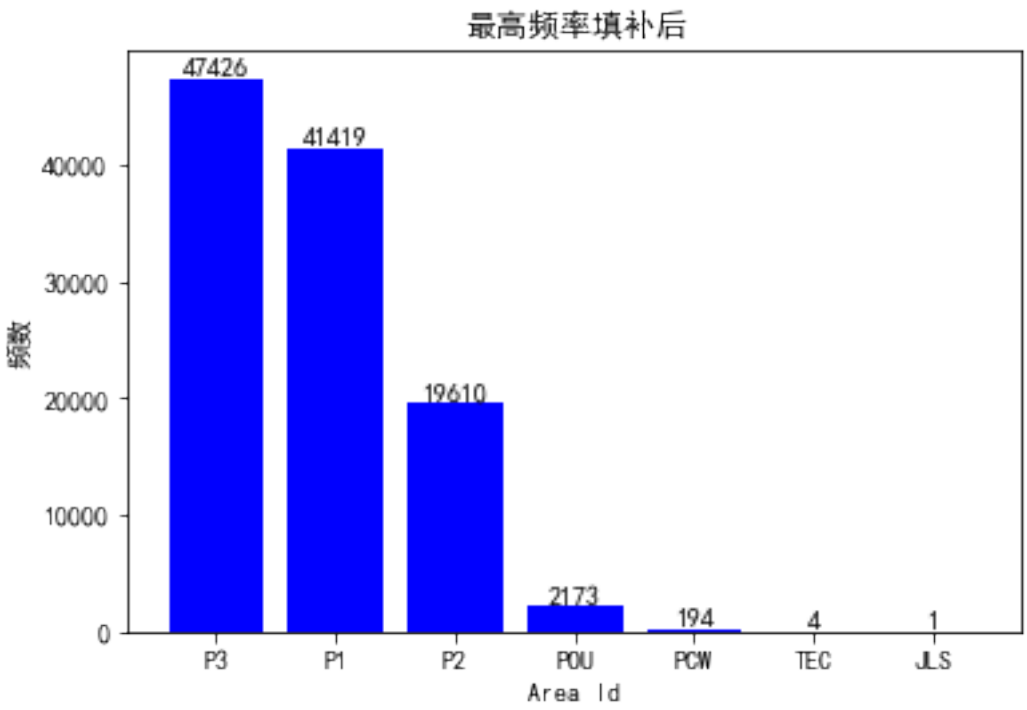


##4.2 1010 Area Id150930 Area Id7P3

```
In [43]: import pandas as pd
         import numpy as np
         from collections import Counter
         import matplotlib.pyplot as plt
         plt.rcParams['font.sans-serif'] = ['SimHei']
         plt.rcParams['axes.unicode_minus'] = False
         path = 'C:/Users/ZL/Desktop/oakland-crime-statistics-2011-to-2016/records-for-2016.csv

         def draw(data, cl, xlabel):
             num = 7
             data = data.values
             counter = Counter(data[:, cl])
             frequency = counter.most_common()  # n
             num_list = []
             name_list = []
             for i in range(num):
                 num_list.append(int(frequency[i][1]))
                 name_list.append(str(frequency[i][0]))
             fig, ax = plt.subplots()
             b = ax.bar(name_list, num_list)
             plt.bar(range(len(num_list)), num_list, color='blue', tick_label=name_list)
             for a, b in zip(name_list, num_list):
                 ax.text(a, b + 1, b, ha='center', va='bottom')
```

```
    plt.title('')
    plt.xlabel(xlabel)
    plt.ylabel('')
    plt.show()


data = pd.read_csv(path, header=0, engine='python', encoding='utf-8')
data = data.values
max_time = []  #
#
for cl in range(data.shape[1]):
    counter = Counter(data[:, cl])
    counter = counter.most_common()  # listlist
    if counter[0][0] == counter[0][0]:  #
        max_time.append(counter[0][0])
    else:  #
        max_time.append(counter[1][0])
#
data_max = pd.DataFrame(data)
for cl in range(data.shape[1]):
    data_max[cl] = data_max[cl].fillna(max_time[cl])
print(data_max.describe())
draw(data_max,3,'Area Id')
```

```
                5
count  110828.000000
mean        1.778440
std         0.415298
min         1.000000
25%         2.000000
50%         2.000000
75%         2.000000
max         2.000000
```


最高频率填补后
47426
41419
19610
2173
194
4
1
40000
30000
20000
10000
0
频数
P3
P1
P2
POU
PCW
TEC
JLS
Area Id

DataPreprocess-Wine Reviews

April 7, 2021

1 Wine Reviews

1.1 Wine Reviewswinemag-data_first150k10 countrydescriptiondesignationprovinceregionregion_2varietywinery pointsprice 7

```
In [22]: import csv
         import numpy as np
         import matplotlib.pyplot as plt
         import pandas as pd
         import json
         from math import sqrt
         from statsmodels.formula.api import ols
         plt.rcParams['font.sans-serif'] = ['SimHei']  #
         # import statsmodels.api as sm
         #
         df = pd.read_csv('C:/Users/ZL/Desktop/winemag-data_first150k.csv')
         #
         label_num = ['points', 'price']
         label_nom = ['country', 'description', 'designation',
                      'province', 'region_1', 'region_2', 'variety', 'winery']
         df_num = df[label_num]#
         df_nom = df[label_nom]#

         # -----------
         #
         def frequency(label):
             f = df[label].value_counts()
             f = pd.DataFrame(f)
             return f

         #
         def OutNominal():
             for item in label_nom:
                 print("{}:\n{}".format(item, frequency(item)))
         OutNominal()
```

```
country:
                        country
```

US	62397
Italy	23478
France	21098
Spain	8268
Chile	5816
Argentina	5631
Portugal	5322
Australia	4957
New Zealand	3320
Austria	3057
Germany	2452
South Africa	2258
Greece	884
Israel	630
Hungary	231
Canada	196
Romania	139
Slovenia	94
Uruguay	92
Croatia	89
Bulgaria	77
Moldova	71
Mexico	63
Turkey	52
Georgia	43
Lebanon	37
Cyprus	31
Brazil	25
Macedonia	16
Serbia	14
Morocco	12
Luxembourg	9
England	9
Lithuania	8
India	8
Czech Republic	6
Ukraine	5
South Korea	4
Bosnia and Herzegovina	4
Switzerland	4
China	3
Slovakia	3
Egypt	3
Albania	2
Japan	2
Montenegro	2
Tunisia	2
US-France	1

description:

	description
Powerful in Zinny character, this blend of Dry ...	6
A little bit funky and unsettled when you pop t...	6
86-88 This could work as a rich wine, because t...	6
92-94 Barrel sample. A rounded wine, its tannin...	6
Sweet cherry and baking vanilla aromas are foll...	5
Gibilmoro, a pure expression of Nero d'Avola, s...	5
This is the kind of inexpensive Cabernet you ca...	4
The bubbles really intensify the varietal chara...	4
Tageto is a Bordeaux blend from Coastal Tuscany...	4
Made from hand-picked grapes and unfiltered, th...	4
Dark and fully oaked Rioja with vanilla, mocha,...	4
This oak-aged blend of Trebbiano, Colombana and...	4
A blend from two well-regarded vineyards, this ...	4
A bright, berry-flavored wine, acidity showing ...	4
Ripe pear fruit flavors go with green plums in ...	4
Sweetly ripe and oaky, with pineapple jam, kiwi...	4
Fresh and fruity, with attractive pink coloring...	4
This Bolgheri blend of Cabernet Sauvignon (60%)...	4
Baia al Vento (windy bay) is a mostly Merlot-ba...	4
One-dimensional in fruit, but clean and zesty, ...	4
Well integrated in terms of barrel use (listed ...	4
From a fourth-generation farming family, this w...	4
This Chardonnay and Pinot Noir blend smells swe...	4
Lime zest and freshly cut grass lend a particul...	4
Tastes soft and almost sweet, with melted raspb...	4
A good everyday wine. It's dry, full-bodied and...	4
A finely structured wine, its tannin fitting we...	4
Soft and full in the mouth, with spice adding a...	4
A spicy, berry-dominated wine, rustic edging to...	4
Light on the nose, with dilute red-berry aromas...	4
...	...
Mint and milk chocolate are the lead aromas, fo...	1
For a five-spot you get syrupy but fairly deep ...	1
This is a very herbal wine, with a green medici...	1
Klopp is a mix of California and Burgundy clone...	1
Rich in blackberry, blueberry, plum, cocoa and ...	1
The nose begins with wheat grass and chopped ch...	1
A change in style from the soft, round version ...	1
Certified French organic with this vintage, thi...	1
Smooth, chewy tannins on the palate with ripe r...	1
This gorgeous Riserva Chardonnay shows modern o...	1
Full of red fruits, it also has a strong struct...	1
Founded in 1915, Donelli produces some of centr...	1
Intense, concentrated, this blend seems to brin...	1
A lovely wine to drink now. It's soft, dry, bal...	1
Vegetal, unripe, with gluey-sweet flavors.	1

Aged only in stainless steel, this is a food-fr...	1
Has an odd green aroma, like capers. On the pal...	1
Smells like a chocolate brownie, tastes dry and...	1
Smoky wood aromas, with pure black fruits are a...	1
This is tastes a little soft and sweet, with ra...	1
Mauritson has been building up a pretty good tr...	1
There's an intriguing tension to this wine, shi...	1
This steely white offers up very little aromas...	1
Gonzague Lurton, current president of the Marga...	1
Soft and rounded with ripe apple and pear flavo...	1
This ultrafresh wine is in a very different sty...	1
This 55% Cabernet Sauvignon, 45% Merlot wine is...	1
Very soft and ripe in black cherries, chocolate...	1
Father-and-son vintners Joe and Sam Miller cons...	1
Cloudy in the glass, this appellation blend sho...	1

[97821 rows x 1 columns]
designation:

	designation
Reserve	2752
Reserva	1810
Estate	1571
Barrel sample	1326
Riserva	754
Barrel Sample	639
Brut	624
Crianza	503
Estate Grown	449
Estate Bottled	396
Dry	374
Old Vine	331
Gran Reserva	330
Brut Rosé	248
Extra Dry	244
Vieilles Vignes	225
Bien Nacido Vineyard	195
Rosé	180
Late Bottled Vintage	171
Réserve	166
Late Harvest	161
Unoaked	161
Vintage	152
Barrel Select	145
Single Vineyard	144
Tradition	141
Grand Reserve	139
Tinto	128
Old Vines	127

Classic	123
...	...
Estate Damiana Vineyard	1
Egérie Extra Brut	1
Small Lot Collection Barrel-Fermented	1
Cuvée C.M.	1
Miser	1
Vivanco Viura-Malvasía	1
Rich Demi-Sec	1
Auld Alliance	1
T Crianza	1
Dedicación Personal	1
Serrocielo	1
Clos de Clos Genet	1
Premium Vecchia Modena	1
Betsy Vineyard	1
Cuvée César à Sumeire	1
Galî Evreshe	1
Gesture	1
1762	1
Tagus Creek Cabernet Sauvignon and Aragones	1
Vigna Schiena d'Asino	1
Dogtown Vineyard	1
Cava Chrisohoou	1
Semmonay	1
Serra del Conte	1
Lone Acre	1
Sol Duc	1
Reserva Vendimia Seleccionada	1
Tapteil Red Wine	1
Piesporter Michelsberg Auslese	1
Ca' L'Inverno	1

[30621 rows x 1 columns]
province:

	province
California	44508
Washington	9750
Tuscany	7281
Bordeaux	6111
Northern Spain	4892
Mendoza Province	4742
Oregon	4589
Burgundy	4308
Piedmont	4093
Veneto	3962
South Australia	3004
Sicily & Sardinia	2545

New York	2428
Northeastern Italy	1982
Loire Valley	1786
Alsace	1680
Marlborough	1655
Southwest France	1601
Central Italy	1530
Southern Italy	1439
Champagne	1370
Catalonia	1352
Rhône Valley	1318
Colchagua Valley	1201
Languedoc-Roussillon	1082
Douro	1075
Provence	1021
Port	903
Maipo Valley	895
Other	889
...	...
Serra do Sudeste	1
Pannon	1
Colchagua Costa	1
Waitaki Valley	1
San Clemente	1
Dalmatian Coast	1
Lemnos	1
Vino da Tavola della Svizzera Italiana	1
Sterea Ellada	1
Pafos	1
Casablanca-Curicó Valley	1
Viile Timis	1
Central Otago-Marlborough	1
Terasele Dunarii	1
Central Greece	1
Pocerina	1
Limnos	1
Dolenjska	1
Langenlois	1
Stirling	1
Viile Carasului	1
Morocco	1
Valais	1
Zitsa	1
Cape South Coast	1
Beni M'Tir	1
Malgas	1
Martinborough Terrace	1
Vale Trentino	1

```
Neuchâtel                                    1

[455 rows x 1 columns]
region_1:
                                          region_1
Napa Valley                                   6209
Columbia Valley (WA)                          4975
Mendoza                                       3586
Russian River Valley                          3571
California                                    3462
Paso Robles                                   3053
Willamette Valley                             2096
Rioja                                         1893
Toscana                                       1885
Sonoma County                                 1853
Brunello di Montalcino                        1746
Sicilia                                       1701
Alsace                                        1574
Sonoma Coast                                  1473
Carneros                                      1458
Barolo                                        1398
Dry Creek Valley                              1398
Finger Lakes                                  1372
Champagne                                     1369
Santa Barbara County                          1319
Walla Walla Valley (WA)                       1225
Yakima Valley                                 1162
Alexander Valley                              1139
Chianti Classico                              1029
Sta. Rita Hills                                983
Sonoma Valley                                  971
Santa Lucia Highlands                          962
Central Coast                                  950
Ribera del Duero                               899
Santa Ynez Valley                              898
...                                            ...
Cour-Cheverny                                    1
Chignin-Bergeron                                 1
Hautes Cotes de Beaune                           1
Saint-Georges-Saint-Émilion                      1
Alpilles                                         1
Monterey County-Napa County-Sonoma County        1
Galatina                                         1
Isle St. George                                  1
Malibu Coast                                     1
Vin de Pays de Côtes du Tarn                     1
Côtes du Roussillon Villages Tautavel            1
Outer Coastal Plain                              1
```

```
Vin de Pays de Caux                              1
Asprinio di Aversa                               1
Vin de Pays de Hauterive                         1
Cérons                                           1
Grand Roussillon                                 1
Côtes de Montravel                               1
Santa Barbara-Monterey                           1
Clos de Lambrays                                 1
Vin de Pays de Sainte-Marie la Blanche           1
Mitterberg                                       1
Vino de Calidad de Valtiendas                    1
Catamarca                                        1
Coteaux du Languedoc-Pézenas                     1
Central Valley                                   1
McLaren Vale-Padthaway                           1
El Pomar District                                1
Lugana Superiore                                 1
Arribes del Duero                                1

[1236 rows x 1 columns]
region_2:
                        region_2
Central Coast              13057
Sonoma                     11258
Columbia Valley             9157
Napa                        8801
California Other            3516
Willamette Valley           3181
Mendocino/Lake Counties     2389
Sierra Foothills            1660
Napa-Sonoma                 1645
Finger Lakes                1510
Central Valley              1115
Long Island                  771
Southern Oregon              662
Oregon Other                 661
North Coast                  632
Washington Other             593
South Coast                  198
New York Other               147
variety:
                            variety
Chardonnay                    14482
Pinot Noir                    14291
Cabernet Sauvignon            12800
Red Blend                     10062
Bordeaux-style Red Blend       7347
Sauvignon Blanc                6320
```

Syrah	5825
Riesling	5524
Merlot	5070
Zinfandel	3799
Sangiovese	3345
Malbec	3208
White Blend	2824
Rosé	2817
Tempranillo	2556
Nebbiolo	2241
Portuguese Red	2216
Sparkling Blend	2004
Shiraz	1970
Corvina, Rondinella, Molinara	1682
Rhône-style Red Blend	1505
Barbera	1365
Pinot Gris	1365
Cabernet Franc	1363
Sangiovese Grosso	1346
Pinot Grigio	1305
Viognier	1263
Bordeaux-style White Blend	1261
Champagne Blend	1238
Port	1058
...	...
Syrah-Bonarda	1
Altesse	1
Premsal	1
Aidani	1
Grenache Gris	1
Sacy	1
Chardonel	1
Macabeo-Gewürztraminer	1
Trousseau Gris	1
Azal	1
Cabernet Pfeffer	1
Vidadillo	1
Cabernet Franc-Malbec	1
Forcallà	1
Xynisteri	1
Groppello	1
Sangiovese Cabernet	1
Dafni	1
Catalanesca	1
Pinot Grigio-Chardonnay	1
Tinta Francisca	1
Blauburgunder	1
Pinela	1

```
Romorantin                      1
Pinotage-Merlot                 1
Mandilaria                      1
Espadeiro                       1
Garnacha Tintorera              1
Sarba                           1
Terret Blanc                    1

[632 rows x 1 columns]
winery:
                              winery
Williams Selyem                  374
Testarossa                       274
DFJ Vinhos                       258
Chateau Ste. Michelle            225
Columbia Crest                   217
Kendall-Jackson                  216
Concha y Toro                    216
Trapiche                         205
Bouchard Père & Fils             203
Kenwood                          191
De Loach                         189
Joseph Drouhin                   189
Georges Duboeuf                  188
Cameron Hughes                   172
Wines & Winemakers               169
Albert Bichot                    167
Robert Mondavi                   166
Louis Latour                     154
D'Arenberg                       153
Morgan                           153
Dry Creek Vineyard               153
Concannon                        151
Martin Ray                       149
Errazuriz                        148
L'Ecole No. 41                   144
Gary Farrell                     144
Olivier Leflaive                 143
Montes                           142
Waterbrook                       142
Iron Horse                       142
...                              ...
Château la Caderie                 1
Alpha Zeta                         1
Doña Isadora                       1
Gauthier                           1
Domaine Gerald Talmard             1
Boyer                              1
```

```
James Estate                              1
Mark Moretti                              1
Piliota                                   1
Château Reynats                           1
Garcia Schwaderer                         1
Insania                                   1
Fontana d'Italia                          1
Limb                                      1
Costanza Malfatti                         1
Bodega Rolland                            1
Viberti Giovanni                          1
Château la Fortune                        1
Cataregia                                 1
Gridley                                   1
Château Vieux Peyrouquet                  1
Vina Moda                                 1
Gran Cruz                                 1
Château Beaulieu Comtes de Tastes         1
Bodega Cecchin                            1
Magpie Estate                             1
Château Maréchaux                         1
Ocaso                                     1
Paul Buisse                               1
Barbanera                                 1

[14810 rows x 1 columns]
```

.max(),.min(),.mean(),.median(),.quantile().isnull().sum()

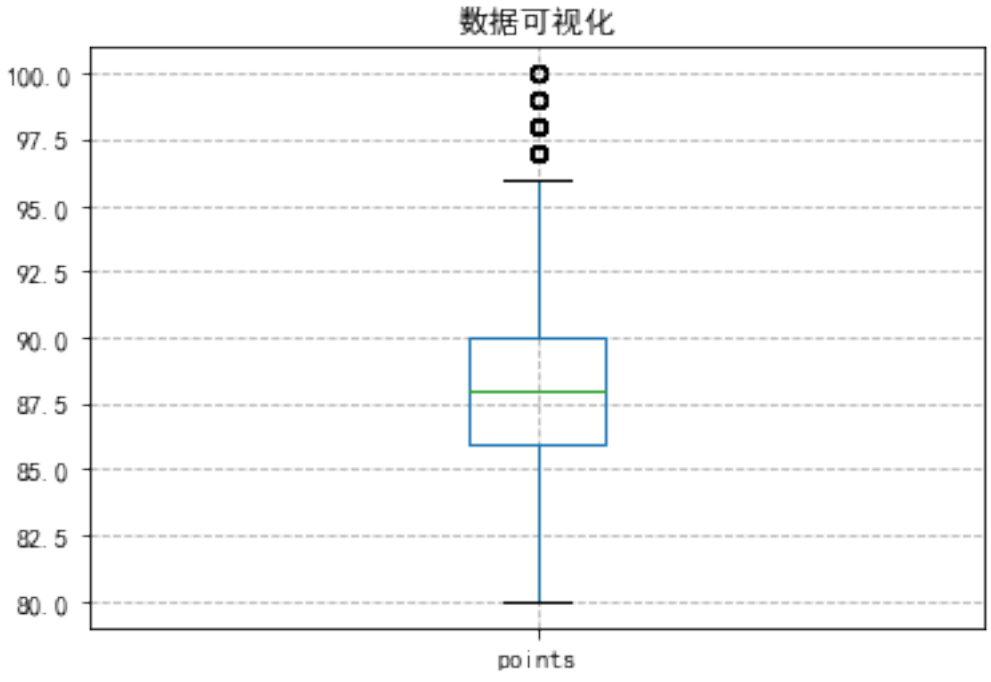
```
In [23]: #5
         def Num5():
             for item in label_num:
                 Minimum = df[item].min()
                 Maximum = df[item].max()
                 Q1 = df[item].quantile(0.25)
                 Median = df[item].mean()
                 Q3 = df[item].quantile(0.75)
                 print("{}{}{}{}{}{}{}".format(item,Minimum,Q1,Median,Q3,Maximum))
         #
         def lostdata(nums,item):
              nulltotal = nums[item].isnull().sum()
              print("{}{}".format(item,nulltotal))
         Num5()
         for item in label_num :
             lostdata(df,item)
```

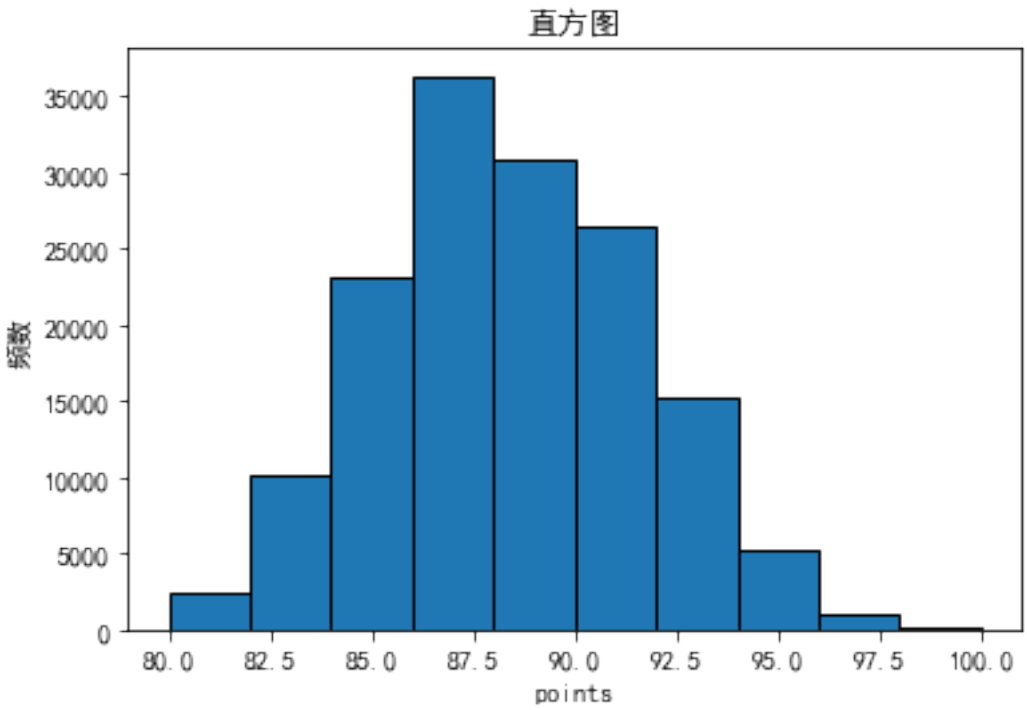
```
points8086.087.888418472139490.0100
price4.016.033.1314824935329940.02300.0
```

```
points0
price13695
```

pointsprice points80~90

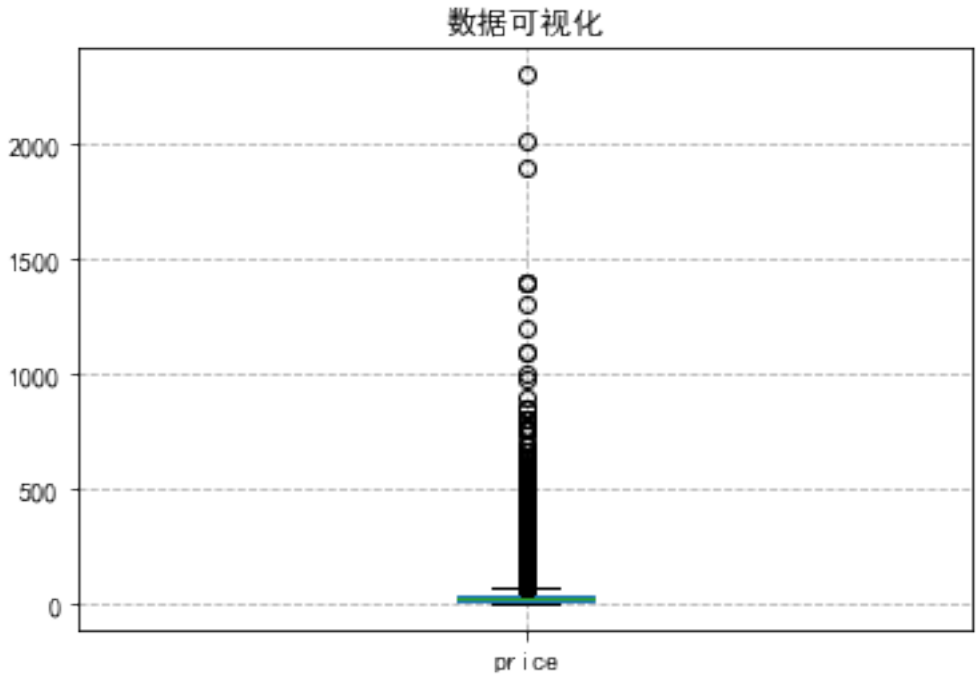
```
In [14]: import pandas as pd
         import numpy as np
         from collections import Counter
         import matplotlib.pyplot as plt
         plt.rcParams['font.sans-serif'] = ['SimHei']
         plt.rcParams['axes.unicode_minus'] = False

         path = 'C:/Users/ZL/Desktop/winemag-data_first150k.csv'
         wine_data = pd.read_csv(path, header=0, index_col=0, engine='python', encoding='utf-8
         wine_data['points'].plot.box(title="")
         plt.grid(linestyle="--")
         plt.show()
         plt.hist(x=wine_data['points'], bins=10, edgecolor='black')
         plt.xlabel('points')
         plt.ylabel('')
         plt.title('')
         plt.show()
```





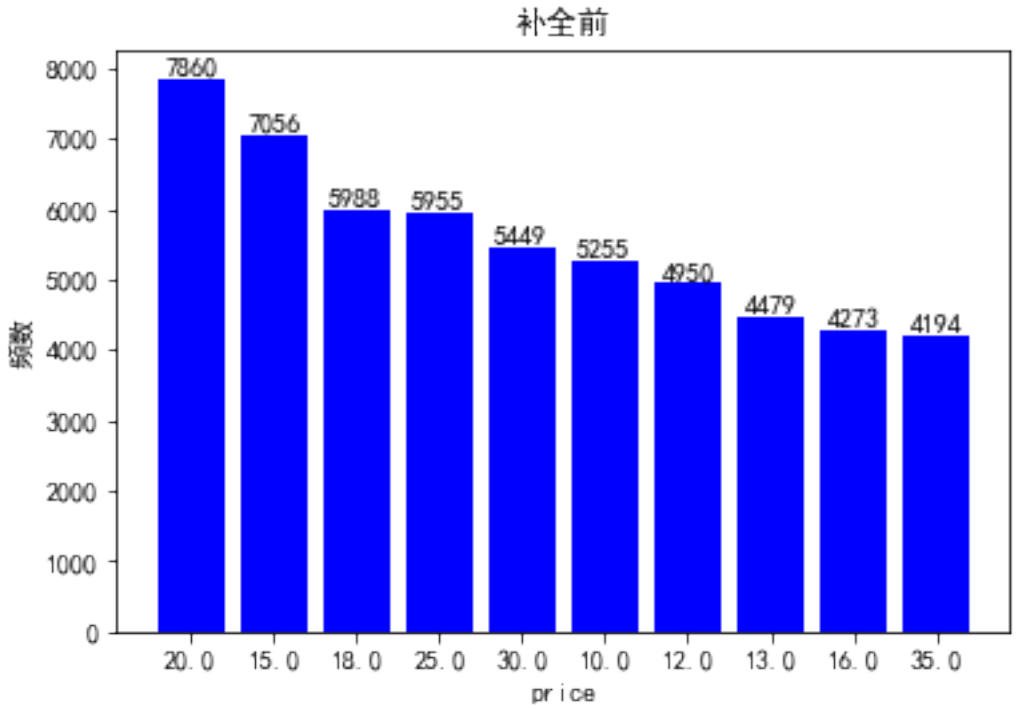
price

```
In [5]: import pandas as pd
        import numpy as np
        from collections import Counter
        import matplotlib.pyplot as plt
        plt.rcParams['font.sans-serif'] = ['SimHei']
        plt.rcParams['axes.unicode_minus'] = False

        path = 'C:/Users/ZL/Desktop/winemag-data_first150k.csv'
        wine_data = pd.read_csv(path, header=0, index_col=0, engine='python', encoding='utf-8'
        wine_data['price'].plot.box(title="")
        plt.grid(linestyle="--")
        plt.show()
```



priceprice10

```
In [12]: # -*- coding: utf-8 -*-
         import matplotlib.pyplot as plt

         plt.rcParams['font.sans-serif'] = ['SimHei']  #
         plt.rcParams['axes.unicode_minus'] = False  #
         fig, ax = plt.subplots()
         num_list = [7860, 7056, 5988, 5955, 5449, 5255, 4950, 4479, 4273, 4194]
         name_list = ['20.0', '15.0', '18.0', '25.0', '30.0', '10.0', '12.0', '13.0', '16.0',
         b = ax.bar(name_list, num_list)
         plt.bar(range(len(num_list)), num_list, color='blue', tick_label=name_list)
         for a, b in zip(name_list, num_list):
             ax.text(a, b + 1, b, ha='center', va='bottom')
         plt.title('')
         plt.xlabel('price')
         plt.ylabel('')
         plt.show()
```

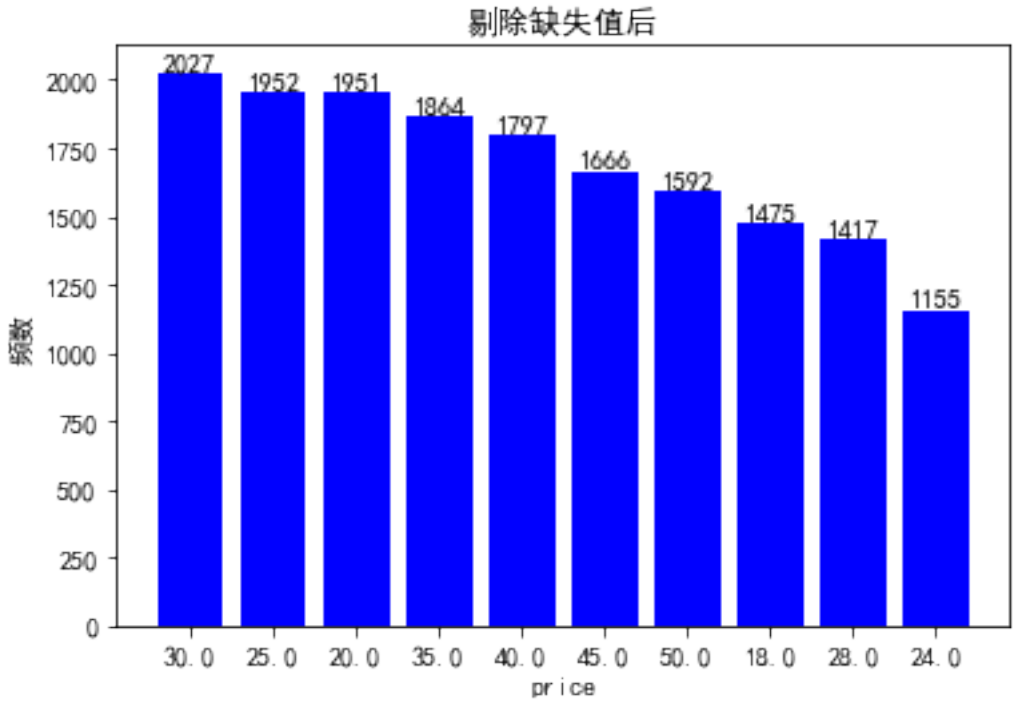


#2 #2.1 39241 price10

```
In [37]: import pandas as pd
         import numpy as np
         from collections import Counter
         import matplotlib.pyplot as plt
         plt.rcParams['font.sans-serif'] = ['SimHei']
         plt.rcParams['axes.unicode_minus'] = False
         path = 'C:/Users/ZL/Desktop/winemag-data_first150k.csv'

         def draw(data):
             num = 10
             wine_data = data.values
             counter = Counter(wine_data[:, 4])
             frequency = counter.most_common()  # n
             num_list = []
             name_list = []
             for i in range(num):
                 num_list.append(int(frequency[i][1]))
                 name_list.append(str(frequency[i][0]))
             fig, ax = plt.subplots()
             b = ax.bar(name_list, num_list)
             plt.bar(range(len(num_list)), num_list, color='blue', tick_label=name_list)
             for a, b in zip(name_list, num_list):
                 ax.text(a, b + 1, b, ha='center', va='bottom')
```

```
        plt.title('')
        plt.xlabel('price')
        plt.ylabel('')
        plt.show()

    wine_data = pd.read_csv(path, header=0, index_col=0, engine='python', encoding='utf-8
    wine_drop = wine_data.dropna()  #
    print(''+str(wine_drop.shape[0]))
    draw(wine_drop)
```

```
39241
```

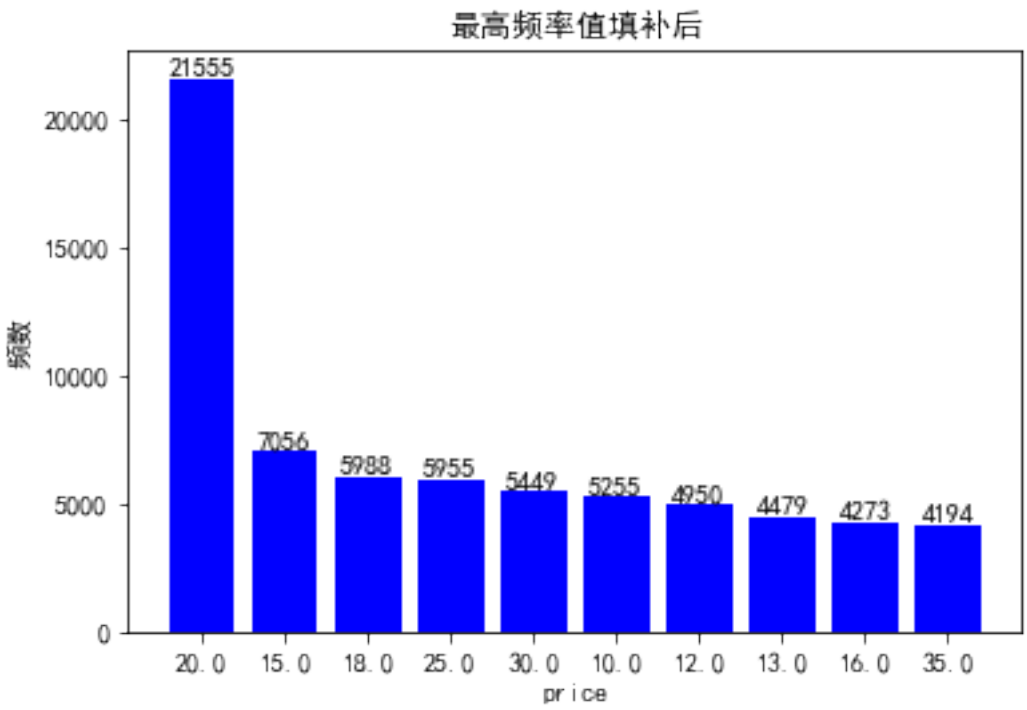


##2.2 1010 pointsprice150930 price10price20

```
In [18]: import pandas as pd
         import numpy as np
         from collections import Counter
         import matplotlib.pyplot as plt
         plt.rcParams['font.sans-serif'] = ['SimHei']
         plt.rcParams['axes.unicode_minus'] = False
         path = 'C:/Users/ZL/Desktop/winemag-data_first150k.csv'

         def draw(data):
             num = 10
```

```
            wine_data = data.values
            counter = Counter(wine_data[:, 4])
            frequency = counter.most_common()  # n
            num_list = []
            name_list = []
            for i in range(num):
                num_list.append(int(frequency[i][1]))
                name_list.append(str(frequency[i][0]))
            fig, ax = plt.subplots()
            b = ax.bar(name_list, num_list)
            plt.bar(range(len(num_list)), num_list, color='blue', tick_label=name_list)
            for a, b in zip(name_list, num_list):
                ax.text(a, b + 1, b, ha='center', va='bottom')
            plt.title('')
            plt.xlabel('price')
            plt.ylabel('')
            plt.show()

        wine_data = pd.read_csv(path, header=0, index_col=0, engine='python', encoding='utf-8
        wine_data = wine_data.values
        max_time = []  #
        #
        for cl in range(wine_data.shape[1]):
            counter = Counter(wine_data[:, cl])
            counter = counter.most_common()  # listlist
            if counter[0][0] == counter[0][0]:  #
                max_time.append(counter[0][0])
            else:  #
                max_time.append(counter[1][0])
        #
        wine_max = pd.DataFrame(wine_data)
        for cl in range(wine_data.shape[1]):
            wine_max[cl] = wine_max[cl].fillna(max_time[cl])
        print(wine_max.describe())
        draw(wine_max)
```

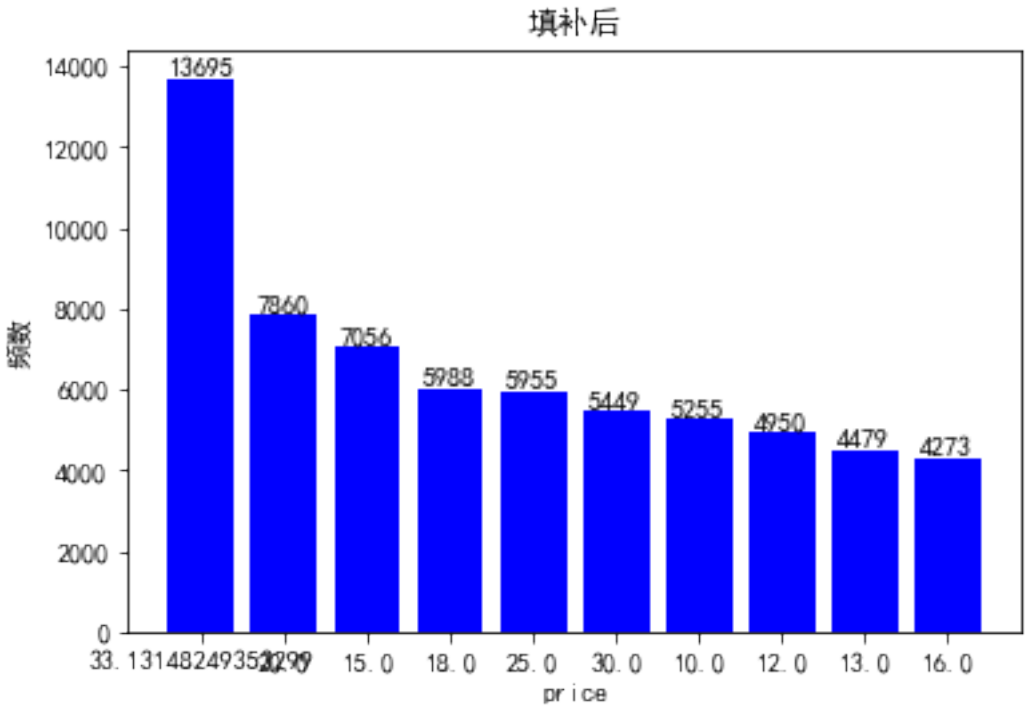
```
                3             4
count  150930.000000  150930.000000
mean       87.888418      31.939966
std         3.222392      34.840211
min        80.000000       4.000000
25%        86.000000      16.000000
50%        88.000000      22.000000
75%        90.000000      38.000000
max       100.000000    2300.000000
```



##2.3 price1033.13

```
In [46]: import pandas as pd
         import numpy as np
         from collections import Counter
         import matplotlib.pyplot as plt
         from sklearn.preprocessing import Imputer

         plt.rcParams['font.sans-serif'] = ['SimHei']
         plt.rcParams['axes.unicode_minus'] = False
         path = 'C:/Users/ZL/Desktop/winemag-data_first150k.csv'

         def draw(data, cl):
             num = 10
             wine_data = data.values
             counter = Counter(wine_data[:, cl])
             frequency = counter.most_common()  # n
             num_list = []
             name_list = []
             for i in range(num):
                 num_list.append(int(frequency[i][1]))
                 name_list.append(str(frequency[i][0]))
             fig, ax = plt.subplots()
             b = ax.bar(name_list, num_list)
             plt.bar(range(len(num_list)), num_list, color='blue', tick_label=name_list)
```

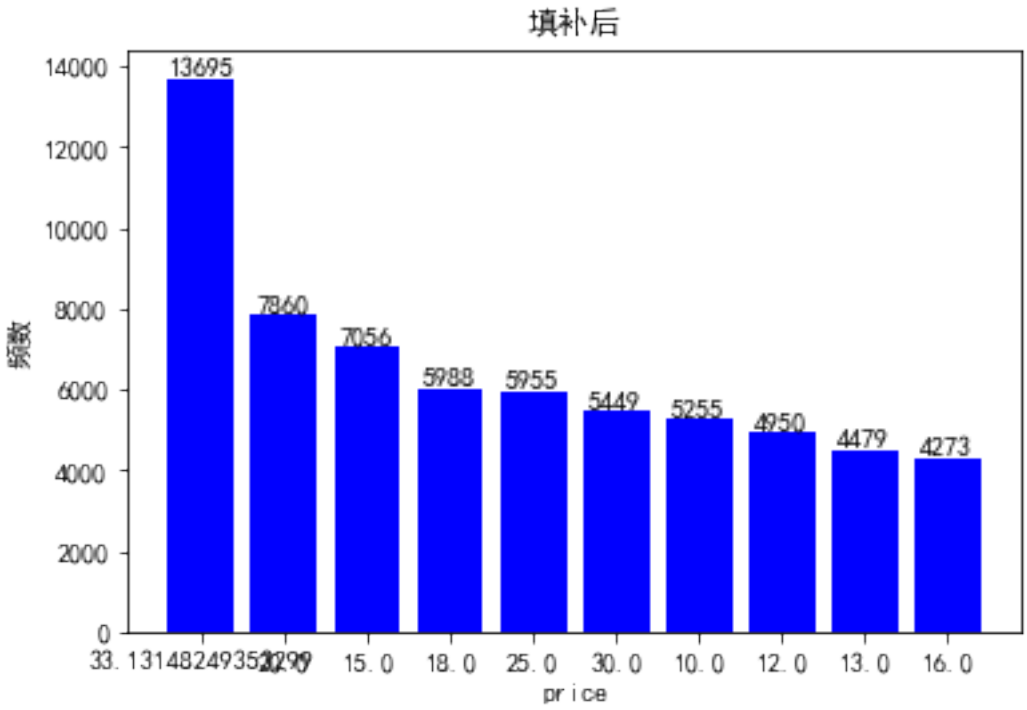
```
        for a, b in zip(name_list, num_list):
            ax.text(a, b + 1, b, ha='center', va='bottom')
        plt.title('')
        plt.xlabel('price')
        plt.ylabel('')
        plt.show()

    #
    def att_rel(path):
        wine_data = pd.read_csv(path, header=0, index_col=0, engine='python', encoding='u
        wine_data = wine_data.values
        im = Imputer(missing_values='NaN', strategy='mean', axis=0)
        att_data = im.fit_transform(wine_data[:, 4].reshape(-1, 1))
        draw(pd.DataFrame(att_data), 0)

    att_rel(path)
```



##2.4 priceIterativeImputer10

```
In [2]: import pandas as pd
        import numpy as np
        from collections import Counter
        import matplotlib.pyplot as plt
        from fancyimpute import IterativeImputer
```

```
plt.rcParams['font.sans-serif'] = ['SimHei']
plt.rcParams['axes.unicode_minus'] = False
path = 'C:/Users/ZL/Desktop/winemag-data_first150k.csv'

def draw(data, cl):
    num = 10
    wine_data = data.values
    counter = Counter(wine_data[:, cl])
    frequency = counter.most_common()  # n
    num_list = []
    name_list = []
    for i in range(num):
        num_list.append(int(frequency[i][1]))
        name_list.append(str(frequency[i][0]))
    fig, ax = plt.subplots()
    b = ax.bar(name_list, num_list)
    plt.bar(range(len(num_list)), num_list, color='blue', tick_label=name_list)
    for a, b in zip(name_list, num_list):
        ax.text(a, b + 1, b, ha='center', va='bottom')
    plt.title('')
    plt.xlabel('price')
    plt.ylabel('')
    plt.show()
#
def obj_sim(path):
    wine_data = pd.read_csv(path, header=0, index_col=0, engine='python', encoding='uti
    wine_data = wine_data.values
    # t = BiScaler().fit_transform(wine_data[:, 4].reshape(-1, 1))
    # obj_data = SoftImpute().fit_transform(t)
    obj_data = IterativeImputer().fit_transform(wine_data[:, 4].reshape(-1, 1))
    draw(pd.DataFrame(obj_data), 0)

obj_sim(path)
```


填补后
14000
12000
10000
8000
6000
4000
2000
0
频数
13695
7860
7056
5988
5955
5449
5255
4950
4479
4273
15.0
18.0
25.0
30.0
10.0
12.0
13.0
16.0
price