PYTHON
数据预处理-2

编译环境：

PyCharm 2019.3 (Community Edition)

Build #PC-193.5233.109, built on November 28, 2019

Runtime version: 11.0.4+10-b520.11 amd64

VM: OpenJDK 64-Bit Server VM by JetBrains s.r.o

Windows 10 10.0

GC: ParNew, ConcurrentMarkSweep

Memory: 1963M

Cores: 8

Registry:

Non-Bundled Plugins:

python 版本：3.7（Anaconda3）

scrapy 版本：1.8

作业三：

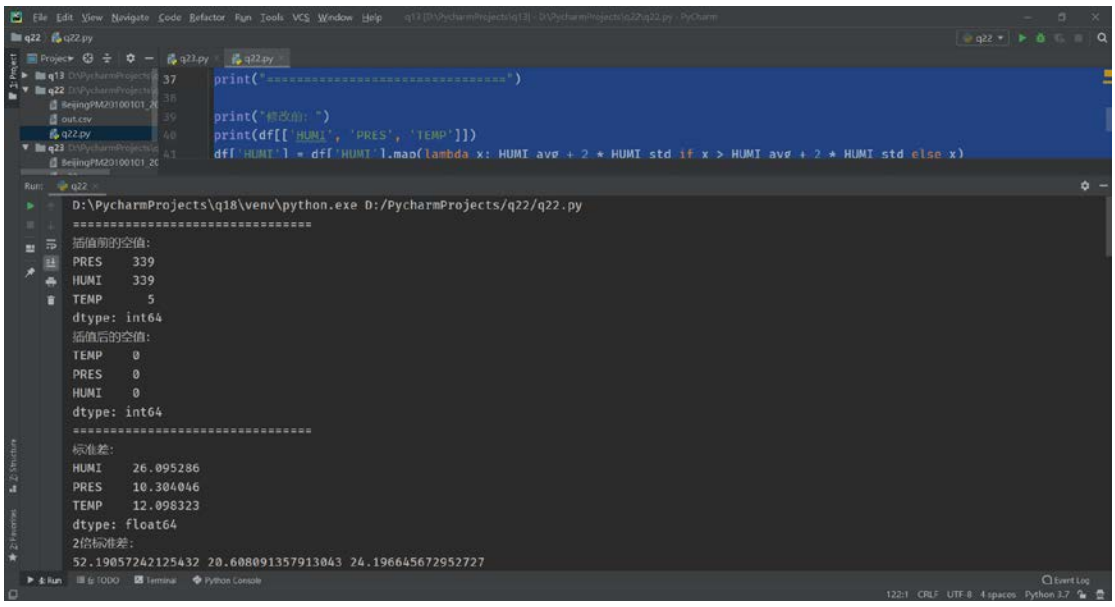
q22.py:

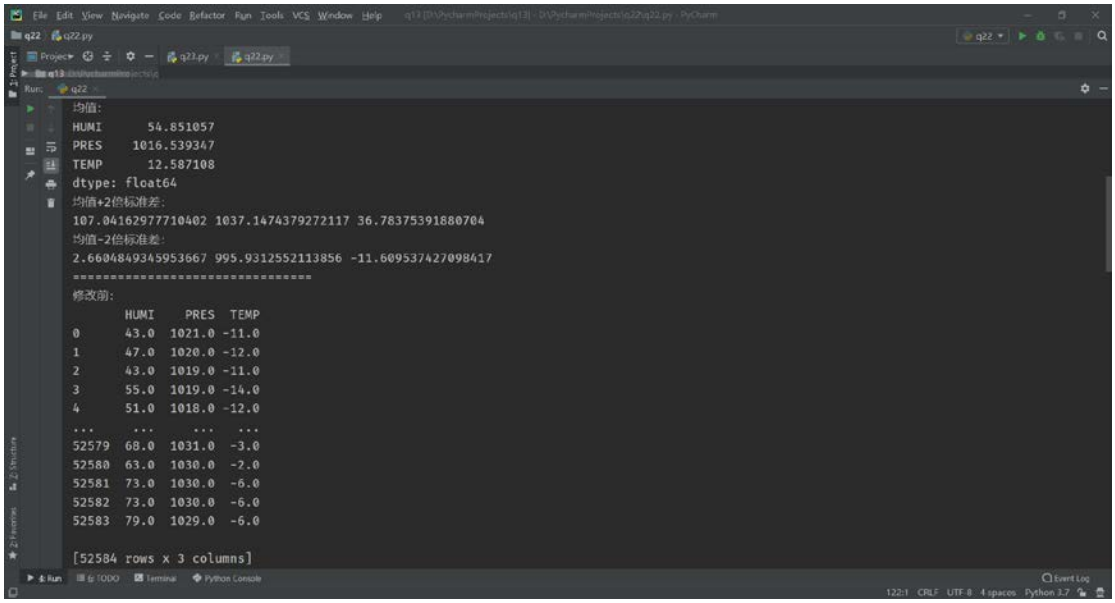
```
import numpy as np
import pandas as pd
import scipy
from scipy import interpolate

fileNameStr = 'BeijingPM20100101_20151231.csv'
df = pd.read_csv(fileNameStr, encoding='utf-8', usecols=[0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11,
12, 13, 14])
```

```
print("==================================")
print("插值前的空值：")
print(df[['HUMI', 'PRES', 'TEMP']].isnull().sum().sort_values(ascending=False))

df["HUMI"] = df["HUMI"].interpolate()
df["PRES"] = df["PRES"].interpolate()
df["TEMP"] = df["TEMP"].interpolate()

print("插值后的空值：")
print(df[['HUMI', 'PRES', 'TEMP']].isnull().sum().sort_values(ascending=False))
print("==================================")

print("标准差：")
print(df[['HUMI', 'PRES', 'TEMP']].std())
HUMI_std = df['HUMI'].std()
PRES_std = df['PRES'].std()
TEMP_std = df['TEMP'].std()
print("2 倍标准差：")
print(2 * HUMI_std, 2 * PRES_std, 2 * TEMP_std)
print("均值：")
print(df[['HUMI', 'PRES', 'TEMP']].mean())
HUMI_avg = df['HUMI'].mean()
PRES_avg = df['PRES'].mean()
TEMP_avg = df['TEMP'].mean()
print("均值+2 倍标准差：")
print(HUMI_avg + 2 * HUMI_std, PRES_avg + 2 * PRES_std, TEMP_avg + 2 * TEMP_std)
print("均值-2 倍标准差：")
print(HUMI_avg - 2 * HUMI_std, PRES_avg - 2 * PRES_std, TEMP_avg - 2 * TEMP_std)
print("==================================")

print("修改前：")
print(df[['HUMI', 'PRES', 'TEMP']])
df['HUMI'] = df['HUMI'].map(lambda x: HUMI_avg + 2 * HUMI_std if x > HUMI_avg + 2
* HUMI_std else x)
df['PRES'] = df['PRES'].map(lambda x: PRES_avg + 2 * PRES_std if x > PRES_avg + 2 *
PRES_std else x)
df['TEMP'] = df['TEMP'].map(lambda x: TEMP_avg + 2 * TEMP_std if x > TEMP_avg + 2 *
TEMP_std else x)
df['HUMI'] = df['HUMI'].map(lambda x: HUMI_avg - 2 * HUMI_std if x > HUMI_avg - 2 *
HUMI_std else x)
df['PRES'] = df['PRES'].map(lambda x: PRES_avg - 2 * PRES_std if x > PRES_avg - 2 * PRES_std
else x)
df['TEMP'] = df['TEMP'].map(lambda x: TEMP_avg - 2 * TEMP_std if x > TEMP_avg - 2 *
TEMP_std else x)
```

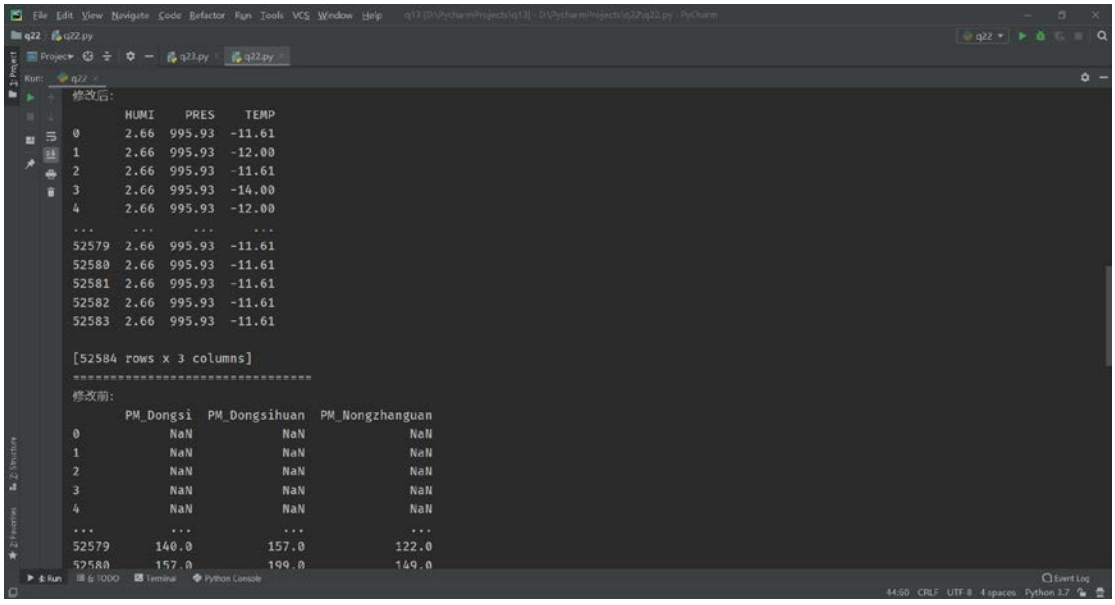
```
df['HUMI'] = df['HUMI'].map(lambda x: "%.2f" % x)
df['PRES'] = df['PRES'].map(lambda x: "%.2f" % x)
df['TEMP'] = df['TEMP'].map(lambda x: "%.2f" % x)
print("修改后：")
print(df[['HUMI', 'PRES', 'TEMP']])
print("==========================================")

print("修改前：")
print(df[['PM_Dongsi', 'PM_Dongsihuan', 'PM_Nongzhanguan']])
df['PM_Dongsi'] = df['PM_Dongsi'].map(lambda x: 500 if x > 500 else x)
df['PM_Dongsihuan'] = df['PM_Dongsihuan'].map(lambda x: 500 if x > 500 else x)
df['PM_Nongzhanguan'] = df['PM_Nongzhanguan'].map(lambda x: 500 if x > 500 else x)
print("修改后：")
print(df[['PM_Dongsi', 'PM_Dongsihuan', 'PM_Nongzhanguan']])
print("==========================================")

print("填充前：")
print(df["cbwd"])

df["cbwd"] = df["cbwd"].map(lambda x: np.NaN if x == 'cv' else x)
df["cbwd"] = df["cbwd"].bfill()
print("填充后：")
print(df["cbwd"])
print("==========================================")

df.to_csv("out.csv")
```

运行结果：

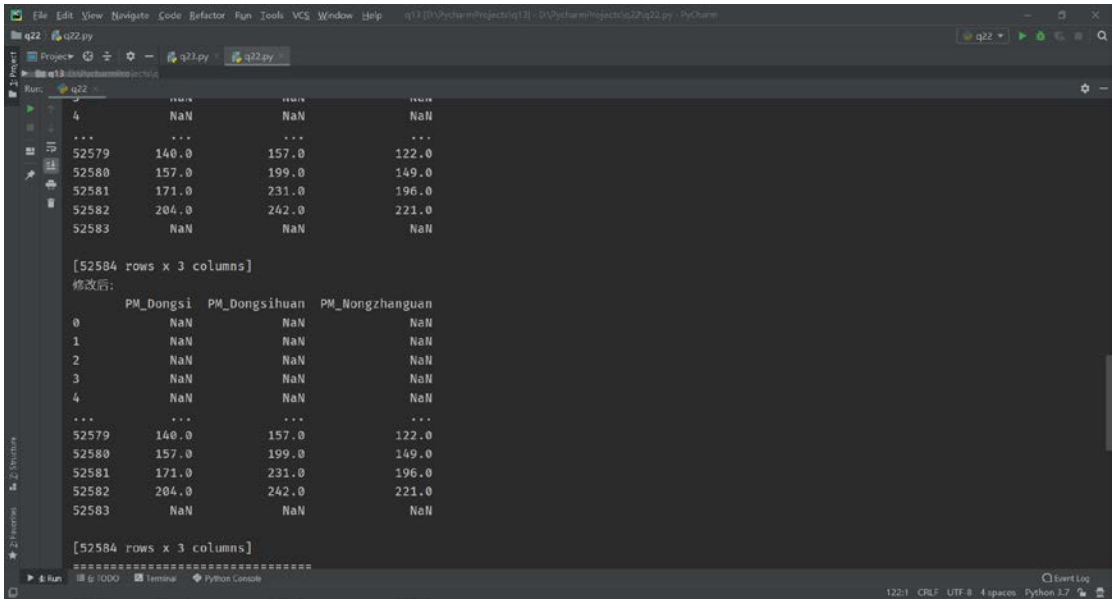




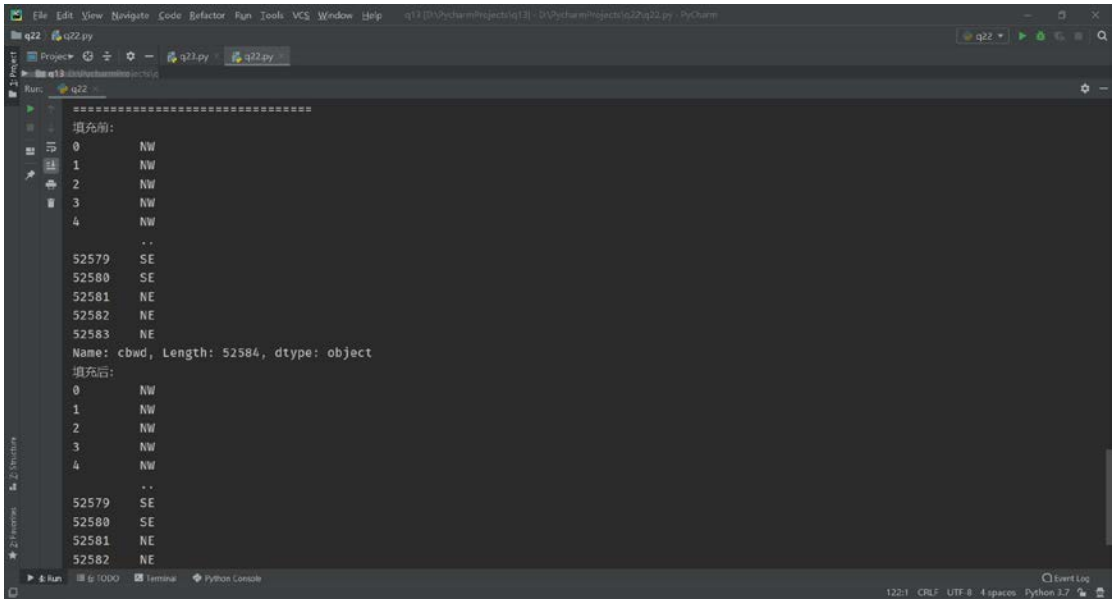
```
均值:
HUMI      54.851057
PRES    1016.539347
TEMP      12.587108
dtype: float64
均值+2倍标准差:
107.04162977710402 1037.1474379272117 36.78375391880704
均值-2倍标准差:
2.6604849345953667 995.9312552113856 -11.609537427098417
================================
修改前:
       HUMI    PRES  TEMP
0      43.0  1021.0 -11.0
1      47.0  1020.0 -12.0
2      43.0  1019.0 -11.0
3      55.0  1019.0 -14.0
4      51.0  1018.0 -12.0
...     ...     ...   ...
52579  68.0  1031.0  -3.0
52580  63.0  1030.0  -2.0
52581  73.0  1030.0  -6.0
52582  73.0  1030.0  -6.0
52583  79.0  1029.0  -6.0

[52584 rows x 3 columns]
```

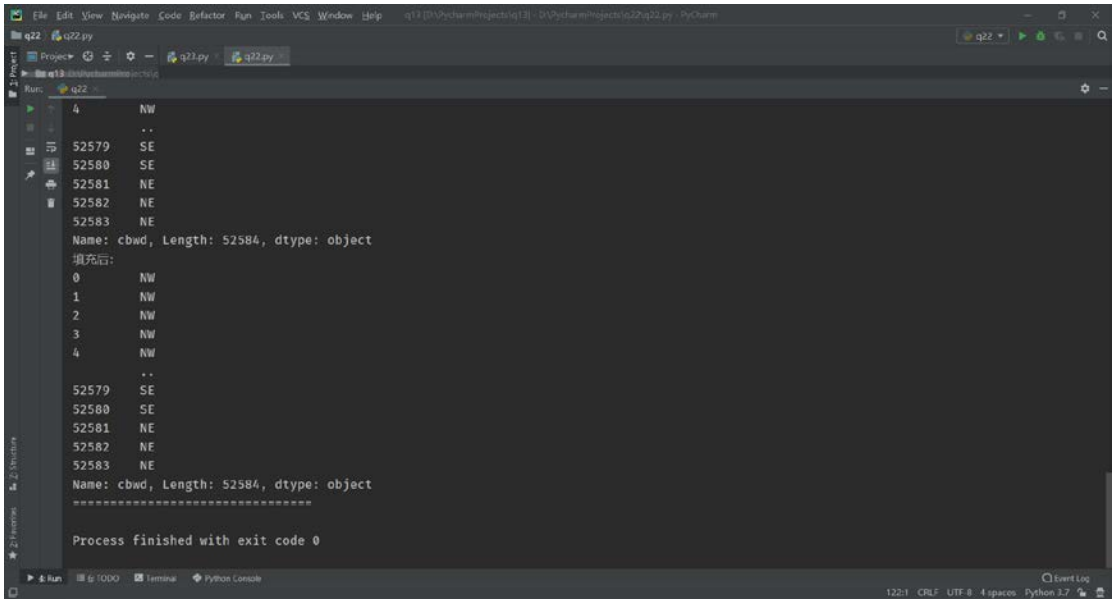


```
修改后:
       HUMI    PRES    TEMP
0      2.66  995.93  -11.61
1      2.66  995.93  -12.00
2      2.66  995.93  -11.61
3      2.66  995.93  -14.00
4      2.66  995.93  -12.00
...     ...     ...     ...
52579  2.66  995.93  -11.61
52580  2.66  995.93  -11.61
52581  2.66  995.93  -11.61
52582  2.66  995.93  -11.61
52583  2.66  995.93  -11.61

[52584 rows x 3 columns]
================================
修改前:
       PM_Dongsi  PM_Dongsihuan  PM_Nongzhanguan
0            NaN            NaN              NaN
1            NaN            NaN              NaN
2            NaN            NaN              NaN
3            NaN            NaN              NaN
4            NaN            NaN              NaN
...          ...            ...              ...
52579      140.0          157.0            122.0
52580      157.0          199.0            149.0
```



```
4            NaN            NaN              NaN
...          ...            ...              ...
52579      140.0          157.0            122.0
52580      157.0          199.0            149.0
52581      171.0          231.0            196.0
52582      204.0          242.0            221.0
52583        NaN            NaN              NaN

[52584 rows x 3 columns]
修改后:
       PM_Dongsi  PM_Dongsihuan  PM_Nongzhanguan
0            NaN            NaN              NaN
1            NaN            NaN              NaN
2            NaN            NaN              NaN
3            NaN            NaN              NaN
4            NaN            NaN              NaN
...          ...            ...              ...
52579      140.0          157.0            122.0
52580      157.0          199.0            149.0
52581      171.0          231.0            196.0
52582      204.0          242.0            221.0
52583        NaN            NaN              NaN

[52584 rows x 3 columns]
================================
```





Out.csv 条数太多，所以只取了前 300 条和后几百条:

,No,year,month,day,hour,season,PM_Dongsi,PM_Dongsihuan,PM_Nongzhanguan,PM_US Post,DEWP,HUMI,PRES,TEMP,cbwd
0,1,2010,1,1,0,4,,,,,-21.0,2.66,995.93,-11.61,NW
1,2,2010,1,1,1,4,,,,,-21.0,2.66,995.93,-12.00,NW
2,3,2010,1,1,2,4,,,,,-21.0,2.66,995.93,-11.61,NW
3,4,2010,1,1,3,4,,,,,-21.0,2.66,995.93,-14.00,NW
4,5,2010,1,1,4,4,,,,,-20.0,2.66,995.93,-12.00,NW
5,6,2010,1,1,5,4,,,,,-19.0,2.66,995.93,-11.61,NW
6,7,2010,1,1,6,4,,,,,-19.0,2.66,995.93,-11.61,NW
7,8,2010,1,1,7,4,,,,,-19.0,2.66,995.93,-11.61,NW
8,9,2010,1,1,8,4,,,,,-19.0,2.66,995.93,-11.61,NW
9,10,2010,1,1,9,4,,,,,-20.0,2.66,995.93,-11.61,NW

10,11,2010,1,1,10,4,,,,,-19.0,2.66,995.93,-11.61,NW
11,12,2010,1,1,11,4,,,,,-18.0,2.66,995.93,-11.61,NW
12,13,2010,1,1,12,4,,,,,-19.0,2.66,995.93,-11.61,NW
13,14,2010,1,1,13,4,,,,,-18.0,2.66,995.93,-11.61,NW
14,15,2010,1,1,14,4,,,,,-18.0,2.66,995.93,-11.61,NW
15,16,2010,1,1,15,4,,,,,-18.0,2.66,995.93,-11.61,NW
16,17,2010,1,1,16,4,,,,,-19.0,2.66,995.93,-11.61,NW
17,18,2010,1,1,17,4,,,,,-18.0,2.66,995.93,-11.61,NW
18,19,2010,1,1,18,4,,,,,-18.0,2.66,995.93,-11.61,NE
19,20,2010,1,1,19,4,,,,,-17.0,2.66,995.93,-11.61,NW
20,21,2010,1,1,20,4,,,,,-17.0,2.66,995.93,-11.61,NW
21,22,2010,1,1,21,4,,,,,-17.0,2.66,995.93,-11.61,NW
22,23,2010,1,1,22,4,,,,,-17.0,2.66,995.93,-11.61,NW
23,24,2010,1,1,23,4,,,,129.0,-17.0,2.66,995.93,-11.61,SE
24,25,2010,1,2,0,4,,,,148.0,-16.0,2.66,995.93,-11.61,SE
25,26,2010,1,2,1,4,,,,159.0,-15.0,2.66,995.93,-11.61,SE
26,27,2010,1,2,2,4,,,,181.0,-11.0,2.66,995.93,-11.61,SE
27,28,2010,1,2,3,4,,,,138.0,-7.0,2.66,995.93,-11.61,SE
28,29,2010,1,2,4,4,,,,109.0,-7.0,2.66,995.93,-11.61,SE
29,30,2010,1,2,5,4,,,,105.0,-7.0,2.66,995.93,-11.61,SE
30,31,2010,1,2,6,4,,,,124.0,-7.0,2.66,995.93,-11.61,SE
31,32,2010,1,2,7,4,,,,120.0,-7.0,2.66,995.93,-11.61,SE
32,33,2010,1,2,8,4,,,,132.0,-8.0,2.66,995.93,-11.61,SE
33,34,2010,1,2,9,4,,,,140.0,-7.0,2.66,995.93,-11.61,SE
34,35,2010,1,2,10,4,,,,152.0,-7.0,2.66,995.93,-11.61,SE
35,36,2010,1,2,11,4,,,,148.0,-8.0,2.66,995.93,-11.61,SE
36,37,2010,1,2,12,4,,,,164.0,-8.0,2.66,995.93,-11.61,SE
37,38,2010,1,2,13,4,,,,158.0,-8.0,2.66,995.93,-11.61,SE
38,39,2010,1,2,14,4,,,,154.0,-9.0,2.66,995.93,-11.61,SE
39,40,2010,1,2,15,4,,,,159.0,-9.0,2.66,995.93,-11.61,SE
40,41,2010,1,2,16,4,,,,164.0,-9.0,2.66,995.93,-11.61,SE
41,42,2010,1,2,17,4,,,,170.0,-8.0,2.66,995.93,-11.61,SE
42,43,2010,1,2,18,4,,,,149.0,-8.0,2.66,995.93,-11.61,SE
43,44,2010,1,2,19,4,,,,154.0,-8.0,2.66,995.93,-11.61,SE
44,45,2010,1,2,20,4,,,,164.0,-7.0,2.66,995.93,-11.61,SE
45,46,2010,1,2,21,4,,,,156.0,-7.0,2.66,995.93,-11.61,SE
46,47,2010,1,2,22,4,,,,126.0,-8.0,2.66,995.93,-11.61,SE
47,48,2010,1,2,23,4,,,,90.0,-8.0,2.66,995.93,-11.61,SE
48,49,2010,1,3,0,4,,,,63.0,-7.0,2.66,995.93,-11.61,SE
49,50,2010,1,3,1,4,,,,65.0,-8.0,2.66,995.93,-11.61,SE
50,51,2010,1,3,2,4,,,,55.0,-8.0,2.66,995.93,-11.61,SE
51,52,2010,1,3,3,4,,,,65.0,-8.0,2.66,995.93,-11.61,SE
52,53,2010,1,3,4,4,,,,83.0,-8.0,2.66,995.93,-11.61,SE
53,54,2010,1,3,5,4,,,,91.0,-9.0,2.66,995.93,-11.61,SE

54,55,2010,1,3,6,4,,,,86.0,-10.0,2.66,995.93,-11.61,SE
55,56,2010,1,3,7,4,,,,82.0,-10.0,2.66,995.93,-11.61,SE
56,57,2010,1,3,8,4,,,,86.0,-10.0,2.66,995.93,-11.61,SE
57,58,2010,1,3,9,4,,,,78.0,-11.0,2.66,995.93,-11.61,SE
58,59,2010,1,3,10,4,,,,98.0,-11.0,2.66,995.93,-11.61,SE
59,60,2010,1,3,11,4,,,,107.0,-11.0,2.66,995.93,-11.61,SE
60,61,2010,1,3,12,4,,,,90.0,-11.0,2.66,995.93,-11.61,SE
61,62,2010,1,3,13,4,,,,96.0,-11.0,2.66,995.93,-11.61,SE
62,63,2010,1,3,14,4,,,,95.0,-11.0,2.66,995.93,-11.61,SE
63,64,2010,1,3,15,4,,,,86.0,-11.0,2.66,995.93,-11.61,SE
64,65,2010,1,3,16,4,,,,70.0,-11.0,2.66,995.93,-11.61,SE
65,66,2010,1,3,17,4,,,,61.0,-11.0,2.66,995.93,-11.61,SE
66,67,2010,1,3,18,4,,,,53.0,-11.0,2.66,995.93,-11.61,NW
67,68,2010,1,3,19,4,,,,71.0,-11.0,2.66,995.93,-11.61,NW
68,69,2010,1,3,20,4,,,,72.0,-10.0,2.66,995.93,-11.61,NW
69,70,2010,1,3,21,4,,,,76.0,-11.0,2.66,995.93,-11.61,NW
70,71,2010,1,3,22,4,,,,73.0,-11.0,2.66,995.93,-11.61,NW
71,72,2010,1,3,23,4,,,,79.0,-12.0,2.66,995.93,-11.61,NW
72,73,2010,1,4,0,4,,,,58.0,-14.0,2.66,995.93,-12.00,NW
73,74,2010,1,4,1,4,,,,25.0,-16.0,2.66,995.93,-11.61,NW
74,75,2010,1,4,2,4,,,,26.0,-17.0,2.66,995.93,-11.61,NW
75,76,2010,1,4,3,4,,,,28.0,-18.0,2.66,995.93,-11.61,NW
76,77,2010,1,4,4,4,,,,26.0,-19.0,2.66,995.93,-11.61,NW
77,78,2010,1,4,5,4,,,,20.0,-20.0,2.66,995.93,-12.00,NW
78,79,2010,1,4,6,4,,,,29.0,-21.0,2.66,995.93,-12.00,NW
79,80,2010,1,4,7,4,,,,26.0,-21.0,2.66,995.93,-13.00,NW
80,81,2010,1,4,8,4,,,,27.0,-22.0,2.66,995.93,-13.00,NW
81,82,2010,1,4,9,4,,,,27.0,-22.0,2.66,995.93,-13.00,NW
82,83,2010,1,4,10,4,,,,25.0,-22.0,2.66,995.93,-12.00,NW
83,84,2010,1,4,11,4,,,,29.0,-23.0,2.66,995.93,-12.00,NW
84,85,2010,1,4,12,4,,,,32.0,-21.0,2.66,995.93,-11.61,NW
85,86,2010,1,4,13,4,,,,28.0,-20.0,2.66,995.93,-11.61,NW
86,87,2010,1,4,14,4,,,,29.0,-21.0,2.66,995.93,-11.61,NW
87,88,2010,1,4,15,4,,,,30.0,-21.0,2.66,995.93,-11.61,NW
88,89,2010,1,4,16,4,,,,30.0,-21.0,2.66,995.93,-11.61,NW
89,90,2010,1,4,17,4,,,,28.0,-20.0,2.66,995.93,-11.61,NW
90,91,2010,1,4,18,4,,,,26.0,-23.0,2.66,995.93,-11.61,NW
91,92,2010,1,4,19,4,,,,31.0,-21.0,2.66,995.93,-12.00,NW
92,93,2010,1,4,20,4,,,,33.0,-24.0,2.66,995.93,-12.00,NW
93,94,2010,1,4,21,4,,,,29.0,-24.0,2.66,995.93,-13.00,NW
94,95,2010,1,4,22,4,,,,31.0,-24.0,2.66,995.93,-13.00,NW
95,96,2010,1,4,23,4,,,,30.0,-26.0,2.66,995.93,-15.00,NW
96,97,2010,1,5,0,4,,,,34.0,-26.0,2.66,995.93,-17.00,NW
97,98,2010,1,5,1,4,,,,27.0,-26.0,2.66,995.93,-18.00,NW

98,99,2010,1,5,2,4,,,,25.0,-26.0,2.66,995.93,-19.00,NW
99,100,2010,1,5,3,4,,,,28.0,-27.0,2.66,995.93,-18.00,NW
100,101,2010,1,5,4,4,,,,28.0,-27.0,2.66,995.93,-19.00,NW
101,102,2010,1,5,5,4,,,,27.0,-27.0,2.66,995.93,-16.00,NE
102,103,2010,1,5,6,4,,,,27.0,-26.0,2.66,995.93,-16.00,NE
103,104,2010,1,5,7,4,,,,27.0,-27.0,2.66,995.93,-16.00,NE
104,105,2010,1,5,8,4,,,,29.0,-26.0,2.66,995.93,-16.00,NE
105,106,2010,1,5,9,4,,,,36.0,-26.0,2.66,995.93,-15.00,NE
106,107,2010,1,5,10,4,,,,30.0,-25.0,2.66,995.93,-14.00,NE
107,108,2010,1,5,11,4,,,,27.0,-25.0,2.66,995.93,-13.00,NE
108,109,2010,1,5,12,4,,,,39.0,-25.0,2.66,995.93,-12.00,NE
109,110,2010,1,5,13,4,,,,41.0,-24.0,2.66,995.93,-11.61,NE
110,111,2010,1,5,14,4,,,,33.0,-22.0,2.66,995.93,-11.61,NW
111,112,2010,1,5,15,4,,,,50.0,-23.0,2.66,995.93,-11.61,NW
112,113,2010,1,5,16,4,,,,56.0,-24.0,2.66,995.93,-11.61,NW
113,114,2010,1,5,17,4,,,,59.0,-23.0,2.66,995.93,-11.61,NW
114,115,2010,1,5,18,4,,,,60.0,-23.0,2.66,995.93,-11.61,NW
115,116,2010,1,5,19,4,,,,84.0,-22.0,2.66,995.93,-13.00,NW
116,117,2010,1,5,20,4,,,,106.0,-22.0,2.66,995.93,-12.00,NW
117,118,2010,1,5,21,4,,,,66.0,-24.0,2.66,995.93,-18.00,NW
118,119,2010,1,5,22,4,,,,50.0,-22.0,2.66,995.93,-13.00,NW
119,120,2010,1,5,23,4,,,,56.0,-22.0,2.66,995.93,-16.00,NW
120,121,2010,1,6,0,4,,,,77.0,-25.0,2.66,995.93,-17.00,NW
121,122,2010,1,6,1,4,,,,50.0,-25.0,2.66,995.93,-14.00,NE
122,123,2010,1,6,2,4,,,,44.0,-26.0,2.66,995.93,-14.00,NE
123,124,2010,1,6,3,4,,,,27.0,-26.0,2.66,995.93,-14.00,NE
124,125,2010,1,6,4,4,,,,28.0,-26.0,2.66,995.93,-14.00,NE
125,126,2010,1,6,5,4,,,,21.0,-26.0,2.66,995.93,-14.00,NE
126,127,2010,1,6,6,4,,,,25.0,-26.0,2.66,995.93,-14.00,NE
127,128,2010,1,6,7,4,,,,20.0,-26.0,2.66,995.93,-15.00,NE
128,129,2010,1,6,8,4,,,,29.0,-26.0,2.66,995.93,-14.00,NE
129,130,2010,1,6,9,4,,,,34.0,-25.0,2.66,995.93,-13.00,NE
130,131,2010,1,6,10,4,,,,42.0,-25.0,2.66,995.93,-12.00,NE
131,132,2010,1,6,11,4,,,,28.0,-24.0,2.66,995.93,-11.61,NE
132,133,2010,1,6,12,4,,,,36.0,-24.0,2.66,995.93,-11.61,NE
133,134,2010,1,6,13,4,,,,48.0,-22.0,2.66,995.93,-11.61,NW
134,135,2010,1,6,14,4,,,,49.0,-22.0,2.66,995.93,-11.61,NW
135,136,2010,1,6,15,4,,,,52.0,-22.0,2.66,995.93,-11.61,NW
136,137,2010,1,6,16,4,,,,56.0,-22.0,2.66,995.93,-11.61,NW
137,138,2010,1,6,17,4,,,,96.0,-21.0,2.66,995.93,-11.61,NW
138,139,2010,1,6,18,4,,,,75.0,-22.0,2.66,995.93,-11.61,NW
139,140,2010,1,6,19,4,,,,105.0,-22.0,2.66,995.93,-14.00,NW
140,141,2010,1,6,20,4,,,,132.0,-22.0,2.66,995.93,-12.00,NW
141,142,2010,1,6,21,4,,,,93.0,-21.0,2.66,995.93,-14.00,NW

142,143,2010,1,6,22,4,,,,131.0,-22.0,2.66,995.93,-16.00,NW
143,144,2010,1,6,23,4,,,,127.0,-21.0,2.66,995.93,-16.00,NW
144,145,2010,1,7,0,4,,,,130.0,-21.0,2.66,995.93,-16.00,NW
145,146,2010,1,7,1,4,,,,43.0,-21.0,2.66,995.93,-16.00,NW
146,147,2010,1,7,2,4,,,,37.0,-22.0,2.66,995.93,-18.00,NW
147,148,2010,1,7,3,4,,,,30.0,-23.0,2.66,995.93,-15.00,NW
148,149,2010,1,7,4,4,,,,28.0,-24.0,2.66,995.93,-16.00,NW
149,150,2010,1,7,5,4,,,,24.0,-25.0,2.66,995.93,-15.00,NW
150,151,2010,1,7,6,4,,,,23.0,-24.0,2.66,995.93,-15.00,NW
151,152,2010,1,7,7,4,,,,24.0,-25.0,2.66,995.93,-13.00,NE
152,153,2010,1,7,8,4,,,,27.0,-24.0,2.66,995.93,-14.00,NW
153,154,2010,1,7,9,4,,,,40.0,-23.0,2.66,995.93,-12.00,NW
154,155,2010,1,7,10,4,,,,42.0,-22.0,2.66,995.93,-11.61,NW
155,156,2010,1,7,11,4,,,,42.0,-20.0,2.66,995.93,-11.61,NW
156,157,2010,1,7,12,4,,,,55.0,-21.0,2.66,995.93,-11.61,NW
157,158,2010,1,7,13,4,,,,52.0,-21.0,2.66,995.93,-11.61,NW
158,159,2010,1,7,14,4,,,,51.0,-20.0,2.66,995.93,-11.61,NW
159,160,2010,1,7,15,4,,,,57.0,-20.0,2.66,995.93,-11.61,NW
160,161,2010,1,7,16,4,,,,50.0,-18.0,2.66,995.93,-11.61,NW
161,162,2010,1,7,17,4,,,,54.0,-19.0,2.66,995.93,-11.61,NW
162,163,2010,1,7,18,4,,,,67.0,-19.0,2.66,995.93,-11.61,NE
163,164,2010,1,7,19,4,,,,106.0,-18.0,2.66,995.93,-11.61,NW
164,165,2010,1,7,20,4,,,,159.0,-19.0,2.66,995.93,-15.00,NE
165,166,2010,1,7,21,4,,,,198.0,-19.0,2.66,995.93,-14.00,NW
166,167,2010,1,7,22,4,,,,190.0,-21.0,2.66,995.93,-14.00,NW
167,168,2010,1,7,23,4,,,,210.0,-21.0,2.66,995.93,-16.00,NW
168,169,2010,1,8,0,4,,,,195.0,-21.0,2.66,995.93,-17.00,NW
169,170,2010,1,8,1,4,,,,275.0,-19.0,2.66,995.93,-16.00,NW
170,171,2010,1,8,2,4,,,,164.0,-20.0,2.66,995.93,-16.00,NE
171,172,2010,1,8,3,4,,,,110.0,-19.0,2.66,995.93,-15.00,SE
172,173,2010,1,8,4,4,,,,100.0,-18.0,2.66,995.93,-15.00,NW
173,174,2010,1,8,5,4,,,,81.0,-18.0,2.66,995.93,-15.00,NW
174,175,2010,1,8,6,4,,,,71.0,-18.0,2.66,995.93,-15.00,NW
175,176,2010,1,8,7,4,,,,66.0,-16.0,2.66,995.93,-13.00,NE
176,177,2010,1,8,8,4,,,,92.0,-16.0,2.66,995.93,-12.00,SE
177,178,2010,1,8,9,4,,,,135.0,-16.0,2.66,995.93,-12.00,SE
178,179,2010,1,8,10,4,,,,155.0,-17.0,2.66,995.93,-11.61,NE
179,180,2010,1,8,11,4,,,,198.0,-16.0,2.66,995.93,-11.61,SE
180,181,2010,1,8,12,4,,,,250.0,-16.0,2.66,995.93,-11.61,SE
181,182,2010,1,8,13,4,,,,200.0,-15.0,2.66,995.93,-11.61,SE
182,183,2010,1,8,14,4,,,,231.0,-16.0,2.66,995.93,-11.61,SE
183,184,2010,1,8,15,4,,,,250.0,-16.0,2.66,995.93,-11.61,SE
184,185,2010,1,8,16,4,,,,212.0,-16.0,2.66,995.93,-11.61,SE
185,186,2010,1,8,17,4,,,,219.0,-17.0,2.66,995.93,-11.61,SE

186,187,2010,1,8,18,4,,,,227.0,-17.0,2.66,995.93,-11.61,NW
187,188,2010,1,8,19,4,,,,226.0,-17.0,2.66,995.93,-11.61,NW
188,189,2010,1,8,20,4,,,,225.0,-17.0,2.66,995.93,-12.00,NW
189,190,2010,1,8,21,4,,,,168.0,-18.0,2.66,995.93,-14.00,NW
190,191,2010,1,8,22,4,,,,169.0,-16.0,2.66,995.93,-11.61,NW
191,192,2010,1,8,23,4,,,,165.0,-16.0,2.66,995.93,-11.61,NW
192,193,2010,1,9,0,4,,,,159.0,-17.0,2.66,995.93,-13.00,NW
193,194,2010,1,9,1,4,,,,167.0,-17.0,2.66,995.93,-13.00,NW
194,195,2010,1,9,2,4,,,,196.0,-17.0,2.66,995.93,-14.00,NW
195,196,2010,1,9,3,4,,,,169.0,-17.0,2.66,995.93,-15.00,NW
196,197,2010,1,9,4,4,,,,155.0,-17.0,2.66,995.93,-13.00,NW
197,198,2010,1,9,5,4,,,,119.0,-19.0,2.66,995.93,-16.00,NW
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205,206,2010,1,9,13,4,,,,50.0,-16.0,2.66,995.93,-11.61,NE
206,207,2010,1,9,14,4,,,,49.0,-15.0,2.66,995.93,-11.61,NE
207,208,2010,1,9,15,4,,,,41.0,-14.0,2.66,995.93,-11.61,NE
208,209,2010,1,9,16,4,,,,37.0,-15.0,2.66,995.93,-11.61,NE
209,210,2010,1,9,17,4,,,,45.0,-15.0,2.66,995.93,-11.61,NW
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211,212,2010,1,9,19,4,,,,54.0,-15.0,2.66,995.93,-11.61,NW
212,213,2010,1,9,20,4,,,,50.0,-15.0,2.66,995.93,-11.61,NW
213,214,2010,1,9,21,4,,,,47.0,-15.0,2.66,995.93,-11.61,NE
214,215,2010,1,9,22,4,,,,66.0,-15.0,2.66,995.93,-11.61,NW
215,216,2010,1,9,23,4,,,,75.0,-15.0,2.66,995.93,-11.61,NW
216,217,2010,1,10,0,4,,,,82.0,-15.0,2.66,995.93,-11.61,NW
217,218,2010,1,10,1,4,,,,66.0,-17.0,2.66,995.93,-13.00,NW
218,219,2010,1,10,2,4,,,,83.0,-17.0,2.66,995.93,-12.00,NW
219,220,2010,1,10,3,4,,,,62.0,-17.0,2.66,995.93,-13.00,NW
220,221,2010,1,10,4,4,,,,40.0,-19.0,2.66,995.93,-14.00,NW
221,222,2010,1,10,5,4,,,,23.0,-18.0,2.66,995.93,-13.00,NW
222,223,2010,1,10,6,4,,,,25.0,-19.0,2.66,995.93,-13.00,NW
223,224,2010,1,10,7,4,,,,27.0,-19.0,2.66,995.93,-14.00,NW
224,225,2010,1,10,8,4,,,,35.0,-19.0,2.66,995.93,-14.00,NW
225,226,2010,1,10,9,4,,,,50.0,-17.0,2.66,995.93,-12.00,NW
226,227,2010,1,10,10,4,,,,70.0,-16.0,2.66,995.93,-11.61,NE
227,228,2010,1,10,11,4,,,,75.0,-15.0,2.66,995.93,-11.61,NW
228,229,2010,1,10,12,4,,,,58.0,-15.0,2.66,995.93,-11.61,NW
229,230,2010,1,10,13,4,,,,70.0,-14.0,2.66,995.93,-11.61,NW

230,231,2010,1,10,14,4,,,,68.0,-14.0,2.66,995.93,-11.61,NW
231,232,2010,1,10,15,4,,,,71.0,-13.0,2.66,995.93,-11.61,NW
232,233,2010,1,10,16,4,,,,88.0,-14.0,2.66,995.93,-11.61,NW
233,234,2010,1,10,17,4,,,,84.0,-14.0,2.66,995.93,-11.61,NW
234,235,2010,1,10,18,4,,,,83.0,-13.0,2.66,995.93,-11.61,NW
235,236,2010,1,10,19,4,,,,66.0,-15.0,2.66,995.93,-11.61,NW
236,237,2010,1,10,20,4,,,,27.0,-15.0,2.66,995.93,-11.61,NW
237,238,2010,1,10,21,4,,,,24.0,-15.0,2.66,995.93,-11.61,NW
238,239,2010,1,10,22,4,,,,22.0,-16.0,2.66,995.93,-11.61,NW
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242,243,2010,1,11,2,4,,,,17.0,-19.0,2.66,995.93,-11.61,NW
243,244,2010,1,11,3,4,,,,17.0,-20.0,2.66,995.93,-11.61,NW
244,245,2010,1,11,4,4,,,,16.0,-21.0,2.66,995.93,-11.61,NE
245,246,2010,1,11,5,4,,,,16.0,-22.0,2.66,995.93,-12.00,NW
246,247,2010,1,11,6,4,,,,20.0,-22.0,2.66,995.93,-12.00,NE
247,248,2010,1,11,7,4,,,,20.0,-22.0,2.66,995.93,-13.00,NW
248,249,2010,1,11,8,4,,,,18.0,-22.0,2.66,995.93,-11.61,NW
249,250,2010,1,11,9,4,,,,25.0,-22.0,2.66,995.93,-11.61,NW
250,251,2010,1,11,10,4,,,,26.0,-22.0,2.66,995.93,-11.61,NW
251,252,2010,1,11,11,4,,,,27.0,-21.0,2.66,995.93,-11.61,NW
252,253,2010,1,11,12,4,,,,28.0,-20.0,2.66,995.93,-11.61,NW
253,254,2010,1,11,13,4,,,,15.0,-19.0,2.66,995.93,-11.61,NW
254,255,2010,1,11,14,4,,,,24.0,-19.0,2.66,995.93,-11.61,NW
255,256,2010,1,11,15,4,,,,13.0,-20.0,2.66,995.93,-11.61,NW
256,257,2010,1,11,16,4,,,,13.0,-20.0,2.66,995.93,-11.61,NW
257,258,2010,1,11,17,4,,,,13.0,-20.0,2.66,995.93,-11.61,NW
258,259,2010,1,11,18,4,,,,17.0,-20.0,2.66,995.93,-11.61,NW
259,260,2010,1,11,19,4,,,,20.0,-22.0,2.66,995.93,-11.61,NW
260,261,2010,1,11,20,4,,,,27.0,-22.0,2.66,995.93,-11.61,NW
261,262,2010,1,11,21,4,,,,20.0,-23.0,2.66,995.93,-11.61,NW
262,263,2010,1,11,22,4,,,,15.0,-23.0,2.66,995.93,-13.00,NW
263,264,2010,1,11,23,4,,,,21.0,-22.0,2.66,995.93,-12.00,NE
264,265,2010,1,12,0,4,,,,21.0,-22.0,2.66,995.93,-15.00,NE
265,266,2010,1,12,1,4,,,,37.0,-22.0,2.66,995.93,-14.00,NE
266,267,2010,1,12,2,4,,,,26.0,-22.0,2.66,995.93,-14.00,NW
267,268,2010,1,12,3,4,,,,15.0,-24.0,2.66,995.93,-18.00,NE
268,269,2010,1,12,4,4,,,,9.0,-24.0,2.66,995.93,-13.00,NE
269,270,2010,1,12,5,4,,,,11.0,-25.0,2.66,995.93,-14.00,NW
270,271,2010,1,12,6,4,,,,11.0,-24.0,2.66,995.93,-14.00,NW
271,272,2010,1,12,7,4,,,,16.0,-25.0,2.66,995.93,-12.00,NW
272,273,2010,1,12,8,4,,,,13.0,-26.0,2.66,995.93,-14.00,NW
273,274,2010,1,12,9,4,,,,15.0,-25.0,2.66,995.93,-12.00,NW

274,275,2010,1,12,10,4,,,,21.0,-25.0,2.66,995.93,-11.61,NW
275,276,2010,1,12,11,4,,,,24.0,-24.0,2.66,995.93,-11.61,NW
276,277,2010,1,12,12,4,,,,22.0,-23.0,2.66,995.93,-11.61,NW
277,278,2010,1,12,13,4,,,,22.0,-22.0,2.66,995.93,-11.61,NW
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281,282,2010,1,12,17,4,,,,25.0,-24.0,2.66,995.93,-11.61,NW
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284,285,2010,1,12,20,4,,,,25.0,-23.0,2.66,995.93,-12.00,NW
285,286,2010,1,12,21,4,,,,22.0,-24.0,2.66,995.93,-12.00,NW
286,287,2010,1,12,22,4,,,,22.0,-23.0,2.66,995.93,-12.00,NW
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289,290,2010,1,13,1,4,,,,11.0,-24.0,2.66,995.93,-12.00,NW
290,291,2010,1,13,2,4,,,,11.0,-25.0,2.66,995.93,-12.00,NW
291,292,2010,1,13,3,4,,,,12.0,-24.0,2.66,995.93,-13.00,NW
292,293,2010,1,13,4,4,,,,11.0,-25.0,2.66,995.93,-12.00,NW
293,294,2010,1,13,5,4,,,,12.0,-25.0,2.66,995.93,-12.00,NW
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295,296,2010,1,13,7,4,,,,28.0,-25.0,2.66,995.93,-12.00,NW
296,297,2010,1,13,8,4,,,,34.0,-25.0,2.66,995.93,-12.00,NW
297,298,2010,1,13,9,4,,,,33.0,-23.0,2.66,995.93,-11.61,NW
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300,301,2010,1,13,12,4,,,,49.0,-21.0,2.66,995.93,-11.61,NW
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52416,52417,2015,12,25,0,4,500.0,500.0,500.0,512.0,-5.0,2.66,995.93,-11.61,SE
52417,52418,2015,12,25,1,4,500.0,500.0,,574.0,-5.0,2.66,995.93,-11.61,SE
52418,52419,2015,12,25,2,4,500.0,500.0,500.0,620.0,-5.0,2.66,995.93,-11.61,SE
52419,52420,2015,12,25,3,4,500.0,488.0,500.0,515.0,-5.0,2.66,995.93,-11.61,NE
52420,52421,2015,12,25,4,4,500.0,498.0,470.0,483.0,-4.0,2.66,995.93,-11.61,SE
52421,52422,2015,12,25,5,4,500.0,472.0,470.0,506.0,-4.0,2.66,995.93,-11.61,SE
52422,52423,2015,12,25,6,4,500.0,500.0,496.0,565.0,-4.0,2.66,995.93,-11.61,SE
52423,52424,2015,12,25,7,4,500.0,500.0,500.0,604.0,-4.0,2.66,995.93,-11.61,SE
52424,52425,2015,12,25,8,4,500.0,500.0,500.0,584.0,-4.0,2.66,995.93,-11.61,SE
52425,52426,2015,12,25,9,4,500.0,500.0,500.0,570.0,-4.0,2.66,995.93,-11.61,SE
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52428,52429,2015,12,25,12,4,500.0,,500.0,580.0,-3.0,2.66,995.93,-11.61,SE
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52430,52431,2015,12,25,14,4,500.0,500.0,500.0,595.0,-3.0,2.66,995.93,-11.61,SE
52431,52432,2015,12,25,15,4,500.0,500.0,500.0,605.0,-4.0,2.66,995.93,-11.61,SE
52432,52433,2015,12,25,16,4,500.0,500.0,500.0,586.0,-4.0,2.66,995.93,-11.61,SE
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52435,52436,2015,12,25,19,4,483.0,454.0,430.0,455.0,-4.0,2.66,995.93,-11.61,NE
52436,52437,2015,12,25,20,4,475.0,447.0,418.0,441.0,-4.0,2.66,995.93,-11.61,NE
52437,52438,2015,12,25,21,4,477.0,433.0,412.0,440.0,-4.0,2.66,995.93,-11.61,NE
52438,52439,2015,12,25,22,4,479.0,450.0,411.0,475.0,-4.0,2.66,995.93,-11.61,NW
52439,52440,2015,12,25,23,4,478.0,459.0,420.0,471.0,-4.0,2.66,995.93,-11.61,NW
52440,52441,2015,12,26,0,4,492.0,482.0,447.0,499.0,-4.0,2.66,995.93,-11.61,NW
52441,52442,2015,12,26,1,4,495.0,484.0,455.0,485.0,-4.0,2.66,995.93,-11.61,NW
52442,52443,2015,12,26,2,4,481.0,484.0,455.0,475.0,-4.0,2.66,995.93,-11.61,NE
52443,52444,2015,12,26,3,4,487.0,461.0,448.0,488.0,-4.0,2.66,995.93,-11.61,NE
52444,52445,2015,12,26,4,4,494.0,434.0,430.0,458.0,-4.0,2.66,995.93,-11.61,NE
52445,52446,2015,12,26,5,4,454.0,405.0,403.0,396.0,-5.0,2.66,995.93,-11.61,NW
52446,52447,2015,12,26,6,4,391.0,357.0,355.0,337.0,-5.0,2.66,995.93,-11.61,NW
52447,52448,2015,12,26,7,4,331.0,292.0,291.0,288.0,-5.0,2.66,995.93,-11.61,NE
52448,52449,2015,12,26,8,4,314.0,294.0,275.0,301.0,-6.0,2.66,995.93,-11.61,NE
52449,52450,2015,12,26,9,4,377.0,344.0,319.0,357.0,-5.0,2.66,995.93,-11.61,SE
52450,52451,2015,12,26,10,4,342.0,310.0,291.0,300.0,-5.0,2.66,995.93,-11.61,SE
52451,52452,2015,12,26,11,4,293.0,273.0,256.0,268.0,-4.0,2.66,995.93,-11.61,SE
52452,52453,2015,12,26,12,4,216.0,191.0,203.0,206.0,-4.0,2.66,995.93,-11.61,SE
52453,52454,2015,12,26,13,4,133.0,134.0,122.0,117.0,-4.0,2.66,995.93,-11.61,SE
52454,52455,2015,12,26,14,4,98.0,95.0,92.0,102.0,-5.0,2.66,995.93,-11.61,SE
52455,52456,2015,12,26,15,4,,94.0,93.0,113.0,-6.0,2.66,995.93,-11.61,SE
52456,52457,2015,12,26,16,4,162.0,146.0,148.0,173.0,-4.0,2.66,995.93,-11.61,NW
52457,52458,2015,12,26,17,4,134.0,154.0,137.0,143.0,-4.0,2.66,995.93,-11.61,NW
52458,52459,2015,12,26,18,4,121.0,183.0,134.0,156.0,-5.0,2.66,995.93,-11.61,NE
52459,52460,2015,12,26,19,4,108.0,194.0,143.0,161.0,-5.0,2.66,995.93,-11.61,NE
52460,52461,2015,12,26,20,4,77.0,154.0,73.0,123.0,-5.0,2.66,995.93,-11.61,NE
52461,52462,2015,12,26,21,4,50.0,66.0,61.0,67.0,-7.0,2.66,995.93,-11.61,SE
52462,52463,2015,12,26,22,4,46.0,48.0,47.0,47.0,-8.0,2.66,995.93,-11.61,SE
52463,52464,2015,12,26,23,4,34.0,43.0,39.0,44.0,-9.0,2.66,995.93,-11.61,SE
52464,52465,2015,12,27,0,4,35.0,36.0,34.0,32.0,-10.0,2.66,995.93,-11.61,SE
52465,52466,2015,12,27,1,4,30.0,36.0,28.0,31.0,-10.0,2.66,995.93,-11.61,NE
52466,52467,2015,12,27,2,4,28.0,31.0,30.0,32.0,-10.0,2.66,995.93,-11.61,NE
52467,52468,2015,12,27,3,4,28.0,32.0,30.0,28.0,-10.0,2.66,995.93,-11.61,NE
52468,52469,2015,12,27,4,4,27.0,35.0,25.0,28.0,-17.0,2.66,995.93,-11.61,NE
52469,52470,2015,12,27,5,4,31.0,39.0,29.0,34.0,-20.0,2.66,995.93,-11.61,NE
52470,52471,2015,12,27,6,4,20.0,33.0,33.0,23.0,-20.0,2.66,995.93,-11.61,NE
52471,52472,2015,12,27,7,4,21.0,22.0,19.0,20.0,-18.0,2.66,995.93,-11.61,NE

52472,52473,2015,12,27,8,4,19.0,29.0,23.0,15.0,-20.0,2.66,995.93,-11.61,NE
52473,52474,2015,12,27,9,4,17.0,30.0,27.0,24.0,-19.0,2.66,995.93,-11.61,NE
52474,52475,2015,12,27,10,4,27.0,39.0,35.0,30.0,-18.0,2.66,995.93,-11.61,NE
52475,52476,2015,12,27,11,4,36.0,57.0,42.0,46.0,-16.0,2.66,995.93,-11.61,NE
52476,52477,2015,12,27,12,4,51.0,60.0,58.0,56.0,-15.0,2.66,995.93,-11.61,NW
52477,52478,2015,12,27,13,4,59.0,66.0,60.0,59.0,-13.0,2.66,995.93,-11.61,NW
52478,52479,2015,12,27,14,4,62.0,65.0,69.0,68.0,-13.0,2.66,995.93,-11.61,NW
52479,52480,2015,12,27,15,4,68.0,70.0,65.0,70.0,-12.0,2.66,995.93,-11.61,NW
52480,52481,2015,12,27,16,4,71.0,82.0,78.0,73.0,-12.0,2.66,995.93,-11.61,NW
52481,52482,2015,12,27,17,4,68.0,88.0,73.0,78.0,-12.0,2.66,995.93,-11.61,NW
52482,52483,2015,12,27,18,4,76.0,89.0,72.0,87.0,-12.0,2.66,995.93,-11.61,NE
52483,52484,2015,12,27,19,4,87.0,104.0,88.0,85.0,-12.0,2.66,995.93,-11.61,NE
52484,52485,2015,12,27,20,4,80.0,155.0,139.0,122.0,-12.0,2.66,995.93,-11.61,NE
52485,52486,2015,12,27,21,4,115.0,149.0,132.0,104.0,-10.0,2.66,995.93,-11.61,NW
52486,52487,2015,12,27,22,4,111.0,115.0,98.0,101.0,-12.0,2.66,995.93,-11.61,NW
52487,52488,2015,12,27,23,4,100.0,123.0,98.0,103.0,-12.0,2.66,995.93,-11.61,NW
52488,52489,2015,12,28,0,4,96.0,148.0,112.0,120.0,-12.0,2.66,995.93,-11.61,NW
52489,52490,2015,12,28,1,4,122.0,171.0,130.0,115.0,-13.0,2.66,995.93,-11.61,NW
52490,52491,2015,12,28,2,4,103.0,112.0,99.0,72.0,-14.0,2.66,995.93,-11.61,NW
52491,52492,2015,12,28,3,4,70.0,76.0,76.0,71.0,-13.0,2.66,995.93,-11.61,NW
52492,52493,2015,12,28,4,4,67.0,68.0,67.0,66.0,-13.0,2.66,995.93,-11.61,NW
52493,52494,2015,12,28,5,4,64.0,61.0,62.0,65.0,-13.0,2.66,995.93,-11.61,NW
52494,52495,2015,12,28,6,4,68.0,81.0,59.0,73.0,-13.0,2.66,995.93,-11.61,NW
52495,52496,2015,12,28,7,4,71.0,134.0,89.0,107.0,-13.0,2.66,995.93,-11.61,NW
52496,52497,2015,12,28,8,4,79.0,142.0,128.0,161.0,-13.0,2.66,995.93,-11.61,NW
52497,52498,2015,12,28,9,4,136.0,99.0,112.0,86.0,-12.0,2.66,995.93,-11.61,NW
52498,52499,2015,12,28,10,4,88.0,56.0,53.0,48.0,-12.0,2.66,995.93,-11.61,NW
52499,52500,2015,12,28,11,4,70.0,55.0,50.0,57.0,-12.0,2.66,995.93,-11.61,NW
52500,52501,2015,12,28,12,4,62.0,63.0,54.0,64.0,-13.0,2.66,995.93,-11.61,NW
52501,52502,2015,12,28,13,4,66.0,65.0,61.0,62.0,-13.0,2.66,995.93,-11.61,NW
52502,52503,2015,12,28,14,4,71.0,61.0,65.0,66.0,-12.0,2.66,995.93,-11.61,NW
52503,52504,2015,12,28,15,4,92.0,69.0,65.0,65.0,-12.0,2.66,995.93,-11.61,NW
52504,52505,2015,12,28,16,4,103.0,86.0,104.0,109.0,-12.0,2.66,995.93,-11.61,SE
52505,52506,2015,12,28,17,4,135.0,123.0,122.0,119.0,-12.0,2.66,995.93,-11.61,SE
52506,52507,2015,12,28,18,4,150.0,141.0,143.0,143.0,-9.0,2.66,995.93,-11.61,SE
52507,52508,2015,12,28,19,4,176.0,147.0,149.0,153.0,-9.0,2.66,995.93,-11.61,SE
52508,52509,2015,12,28,20,4,185.0,171.0,179.0,181.0,-8.0,2.66,995.93,-11.61,SE
52509,52510,2015,12,28,21,4,222.0,215.0,219.0,209.0,-7.0,2.66,995.93,-11.61,SE
52510,52511,2015,12,28,22,4,241.0,249.0,234.0,234.0,-7.0,2.66,995.93,-11.61,SE
52511,52512,2015,12,28,23,4,281.0,277.0,252.0,252.0,-8.0,2.66,995.93,-11.61,NE
52512,52513,2015,12,29,0,4,257.0,312.0,267.0,294.0,-8.0,2.66,995.93,-11.61,NE
52513,52514,2015,12,29,1,4,260.0,311.0,289.0,301.0,-8.0,2.66,995.93,-11.61,SE
52514,52515,2015,12,29,2,4,255.0,325.0,301.0,315.0,-7.0,2.66,995.93,-11.61,NW
52515,52516,2015,12,29,3,4,259.0,335.0,312.0,326.0,-6.0,2.66,995.93,-11.61,NW

52516,52517,2015,12,29,4,4,293.0,353.0,317.0,316.0,-7.0,2.66,995.93,-11.61,NE
52517,52518,2015,12,29,5,4,305.0,373.0,325.0,337.0,-8.0,2.66,995.93,-11.61,NW
52518,52519,2015,12,29,6,4,317.0,370.0,318.0,301.0,-8.0,2.66,995.93,-11.61,NW
52519,52520,2015,12,29,7,4,246.0,337.0,263.0,215.0,-8.0,2.66,995.93,-11.61,NW
52520,52521,2015,12,29,8,4,223.0,312.0,220.0,201.0,-7.0,2.66,995.93,-11.61,NW
52521,52522,2015,12,29,9,4,193.0,223.0,200.0,179.0,-7.0,2.66,995.93,-11.61,NE
52522,52523,2015,12,29,10,4,191.0,178.0,181.0,165.0,-5.0,2.66,995.93,-11.61,NE
52523,52524,2015,12,29,11,4,210.0,206.0,180.0,196.0,-7.0,2.66,995.93,-11.61,NW
52524,52525,2015,12,29,12,4,215.0,231.0,226.0,236.0,-8.0,2.66,995.93,-11.61,NW
52525,52526,2015,12,29,13,4,246.0,265.0,250.0,245.0,-7.0,2.66,995.93,-11.61,SE
52526,52527,2015,12,29,14,4,253.0,304.0,279.0,264.0,-6.0,2.66,995.93,-11.61,SE
52527,52528,2015,12,29,15,4,279.0,341.0,323.0,318.0,-6.0,2.66,995.93,-11.61,SE
52528,52529,2015,12,29,16,4,334.0,389.0,353.0,360.0,-6.0,2.66,995.93,-11.61,SE
52529,52530,2015,12,29,17,4,384.0,433.0,400.0,407.0,-6.0,2.66,995.93,-11.61,SE
52530,52531,2015,12,29,18,4,429.0,471.0,440.0,447.0,-5.0,2.66,995.93,-11.61,SE
52531,52532,2015,12,29,19,4,500.0,500.0,500.0,545.0,-6.0,2.66,995.93,-11.61,SE
52532,52533,2015,12,29,20,4,500.0,500.0,500.0,556.0,-6.0,2.66,995.93,-11.61,SE
52533,52534,2015,12,29,21,4,500.0,500.0,500.0,499.0,-6.0,2.66,995.93,-11.61,SE
52534,52535,2015,12,29,22,4,500.0,491.0,464.0,472.0,-4.0,2.66,995.93,-11.61,SE
52535,52536,2015,12,29,23,4,475.0,467.0,447.0,470.0,-7.0,2.66,995.93,-11.61,NE
52536,52537,2015,12,30,0,4,436.0,500.0,486.0,536.0,-7.0,2.66,995.93,-11.61,NE
52537,52538,2015,12,30,1,4,273.0,500.0,462.0,418.0,-6.0,2.66,995.93,-11.61,NW
52538,52539,2015,12,30,2,4,138.0,500.0,387.0,460.0,-7.0,2.66,995.93,-11.61,NE
52539,52540,2015,12,30,3,4,77.0,468.0,275.0,331.0,-7.0,2.66,995.93,-11.61,NE
52540,52541,2015,12,30,4,4,55.0,366.0,194.0,228.0,-6.0,2.66,995.93,-11.61,NW
52541,52542,2015,12,30,5,4,32.0,329.0,196.0,173.0,-6.0,2.66,995.93,-11.61,NW
52542,52543,2015,12,30,6,4,12.0,143.0,20.0,45.0,-6.0,2.66,995.93,-11.61,NW
52543,52544,2015,12,30,7,4,7.0,32.0,7.0,13.0,-5.0,2.66,995.93,-11.61,NW
52544,52545,2015,12,30,8,4,12.0,14.0,13.0,10.0,-6.0,2.66,995.93,-11.61,NE
52545,52546,2015,12,30,9,4,11.0,12.0,15.0,8.0,-6.0,2.66,995.93,-11.61,NW
52546,52547,2015,12,30,10,4,10.0,7.0,8.0,12.0,-7.0,2.66,995.93,-11.61,NW
52547,52548,2015,12,30,11,4,11.0,11.0,14.0,13.0,-11.0,2.66,995.93,-11.61,NW
52548,52549,2015,12,30,12,4,10.0,8.0,10.0,9.0,-11.0,2.66,995.93,-11.61,NW
52549,52550,2015,12,30,13,4,8.0,9.0,9.0,14.0,-11.0,2.66,995.93,-11.61,NW
52550,52551,2015,12,30,14,4,6.0,9.0,11.0,14.0,-11.0,2.66,995.93,-11.61,NW
52551,52552,2015,12,30,15,4,5.0,9.0,12.0,11.0,-11.0,2.66,995.93,-11.61,NW
52552,52553,2015,12,30,16,4,7.0,8.0,7.0,8.0,-11.0,2.66,995.93,-11.61,NW
52553,52554,2015,12,30,17,4,9.0,9.0,12.0,6.0,-11.0,2.66,995.93,-11.61,NW
52554,52555,2015,12,30,18,4,8.0,12.0,13.0,15.0,-11.0,2.66,995.93,-11.61,NW
52555,52556,2015,12,30,19,4,14.0,21.0,18.0,17.0,-11.0,2.66,995.93,-11.61,NW
52556,52557,2015,12,30,20,4,27.0,19.0,17.0,20.0,-10.0,2.66,995.93,-11.61,NW
52557,52558,2015,12,30,21,4,20.0,34.0,22.0,22.0,-10.0,2.66,995.93,-11.61,NW
52558,52559,2015,12,30,22,4,18.0,35.0,29.0,33.0,-11.0,2.66,995.93,-11.61,NW
52559,52560,2015,12,30,23,4,37.0,32.0,26.0,26.0,-11.0,2.66,995.93,-11.61,NE

52560,52561,2015,12,31,0,4,21.0,33.0,25.0,28.0,-11.0,2.66,995.93,-11.61,NW
52561,52562,2015,12,31,1,4,25.0,34.0,24.0,27.0,-9.0,2.66,995.93,-11.61,NW
52562,52563,2015,12,31,2,4,25.0,28.0,17.0,24.0,-11.0,2.66,995.93,-11.61,NW
52563,52564,2015,12,31,3,4,27.0,29.0,18.0,23.0,-11.0,2.66,995.93,-11.61,NW
52564,52565,2015,12,31,4,4,21.0,33.0,21.0,19.0,-11.0,2.66,995.93,-11.61,NW
52565,52566,2015,12,31,5,4,15.0,42.0,16.0,14.0,-11.0,2.66,995.93,-11.61,NW
52566,52567,2015,12,31,6,4,15.0,31.0,16.0,19.0,-12.0,2.66,995.93,-11.61,NW
52567,52568,2015,12,31,7,4,11.0,26.0,16.0,25.0,-11.0,2.66,995.93,-11.61,NW
52568,52569,2015,12,31,8,4,12.0,24.0,24.0,22.0,-11.0,2.66,995.93,-11.61,NW
52569,52570,2015,12,31,9,4,25.0,33.0,26.0,25.0,-8.0,2.66,995.93,-11.61,NW
52570,52571,2015,12,31,10,4,28.0,,24.0,29.0,-9.0,2.66,995.93,-11.61,NW
52571,52572,2015,12,31,11,4,37.0,,27.0,31.0,-10.0,2.66,995.93,-11.61,NW
52572,52573,2015,12,31,12,4,50.0,,37.0,40.0,-10.0,2.66,995.93,-11.61,NW
52573,52574,2015,12,31,13,4,55.0,,48.0,43.0,-11.0,2.66,995.93,-11.61,NW
52574,52575,2015,12,31,14,4,63.0,,50.0,48.0,-10.0,2.66,995.93,-11.61,SE
52575,52576,2015,12,31,15,4,71.0,61.0,64.0,58.0,-11.0,2.66,995.93,-11.61,SE
52576,52577,2015,12,31,16,4,86.0,75.0,68.0,69.0,-10.0,2.66,995.93,-11.61,SE
52577,52578,2015,12,31,17,4,90.0,102.0,89.0,91.0,-10.0,2.66,995.93,-11.61,SE
52578,52579,2015,12,31,18,4,119.0,117.0,112.0,114.0,-10.0,2.66,995.93,-11.61,SE
52579,52580,2015,12,31,19,4,140.0,157.0,122.0,133.0,-8.0,2.66,995.93,-11.61,SE
52580,52581,2015,12,31,20,4,157.0,199.0,149.0,169.0,-8.0,2.66,995.93,-11.61,SE
52581,52582,2015,12,31,21,4,171.0,231.0,196.0,203.0,-10.0,2.66,995.93,-11.61,NE
52582,52583,2015,12,31,22,4,204.0,242.0,221.0,212.0,-10.0,2.66,995.93,-11.61,NE
52583,52584,2015,12,31,23,4,,,,235.0,-9.0,2.66,995.93,-11.61,NE

作业 4：

q23.py:

```
import pandas as pd
from sklearn.preprocessing import MinMaxScaler
from sklearn.preprocessing import StandardScaler
import matplotlib.pyplot as plt

fileNameStr = 'BeijingPM20100101_20151231.csv'
df = pd.read_csv(fileNameStr, encoding='utf-8', usecols=[0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 13])

min_max_scaler = MinMaxScaler()
std_scaler = StandardScaler()
DEWP_reshape = df['DEWP'].values.reshape(-1, 1)
TEMP_reshape = df['TEMP'].values.reshape(-1, 1)
x2 = min_max_scaler.fit_transform(DEWP_reshape)
y2 = min_max_scaler.fit_transform(TEMP_reshape)
x3 = std_scaler.fit_transform(DEWP_reshape)
y3 = std_scaler.fit_transform(TEMP_reshape)
```

```
fig = plt.figure()

ax1 = fig.add_subplot(131)
x1 = df["DEWP"]
y1 = df["TEMP"]
ax1.scatter(x1, y1, s=10)
ax1.set_title("Original")

ax2 = fig.add_subplot(132)
ax2.scatter(x2, y2, s=10)
ax2.set_title("MinMaxScaler")

ax3 = fig.add_subplot(133)
ax3.scatter(x3, y3, s=10)
ax3.set_title("StandardScaler")

plt.show()

df.dropna(axis='index', how='all', subset=['PM_Dongsi', 'PM_Dongsihuan', 'PM_Nongzhanguan', 'PM_US Post'], inplace=True)

df['sum'] = df[['PM_Dongsi', 'PM_Dongsihuan', 'PM_Nongzhanguan', 'PM_US Post']].sum(axis=1)
df['count'] = df[['PM_Dongsi', 'PM_Dongsihuan', 'PM_Nongzhanguan', 'PM_US Post']].count(axis=1)
df['avg'] = round(df['sum'] / df['count'], 2)

df_mean = df.groupby(["year", "month", "day"])[['avg']].mean()
df_mean = pd.DataFrame(df_mean)
print(df_mean)

sections = [0, 50, 100, 150, 200, 300, df_mean['avg'].max()]
section_names = ['green', 'yellow', 'orange', 'red', 'purple', 'Brownish red']
result = pd.cut(df_mean.avg, sections, labels=section_names)
print(pd.value_counts(result))
```

运行结果：

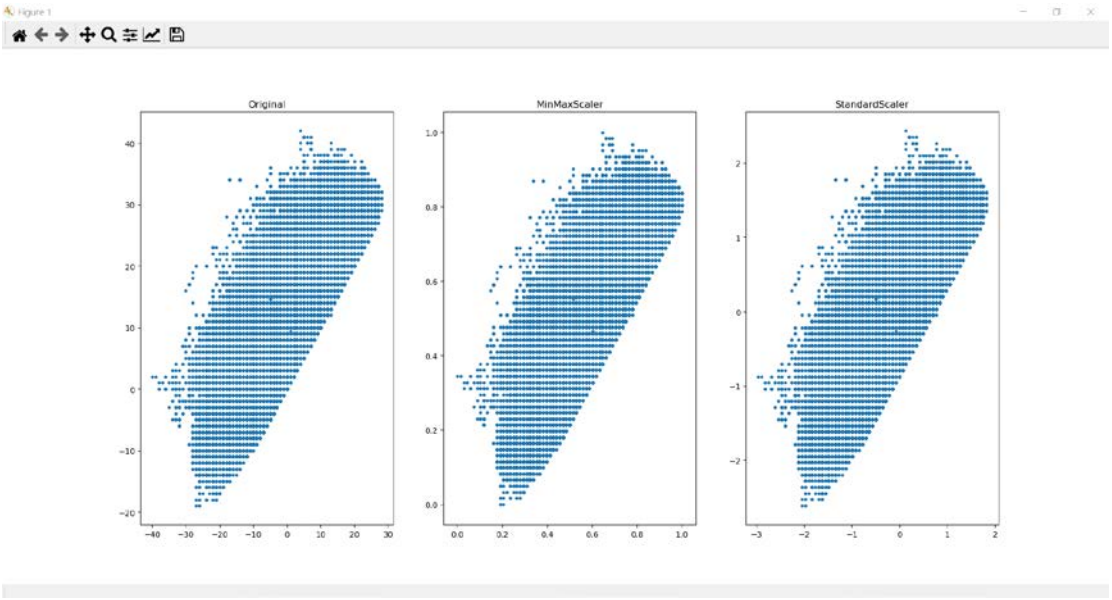
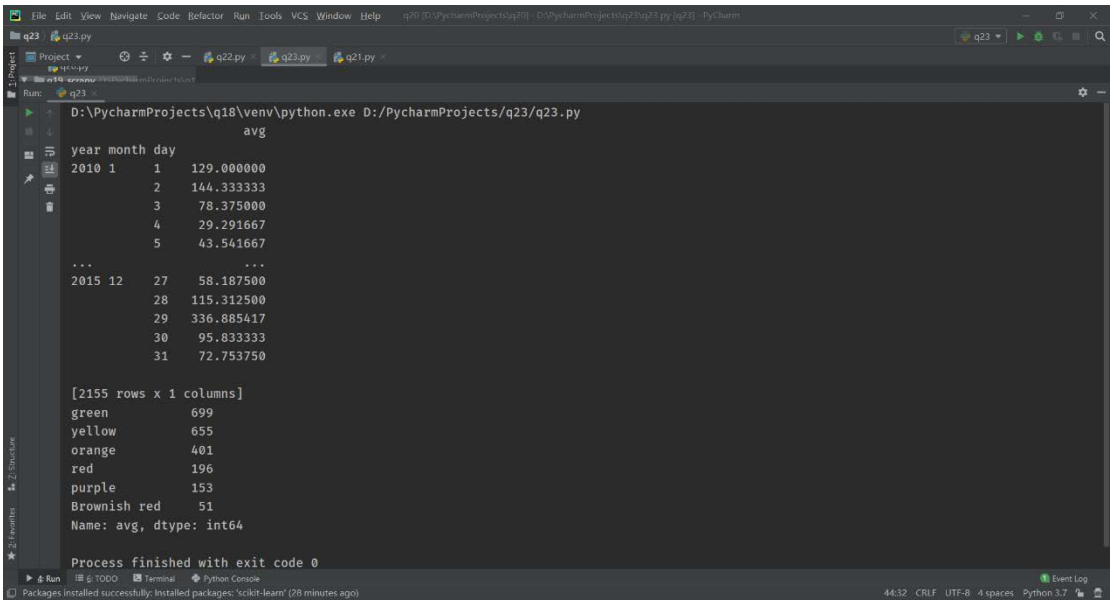


Figure 1
Original
MinMaxScaler
StandardScaler


File Edit View Navigate Code Refactor Run Tools VCS Window Help
q23 | q23.py
Project
q22.py
q23.py
q21.py
Run: q23
D:\PycharmProjects\q18\venv\python.exe D:/PycharmProjects/q23/q23.py
avg
year month day
2010 1 1 129.000000
2 144.333333
3 78.375000
4 29.291667
5 43.541667
... ...
2015 12 27 58.187500
28 115.312500
29 336.885417
30 95.833333
31 72.753750
[2155 rows x 1 columns]
green 699
yellow 655
orange 401
red 196
purple 153
Brownish red 51
Name: avg, dtype: int64
Process finished with exit code 0
Run
6: TODO
Terminal
Python Console
Event Log
Packages installed successfully: Installed packages: 'scikit-learn' (28 minutes ago)
44:32 CRLF UTF-8 4 spaces Python 3.7