Python 实验 数据预处理

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链家网爬虫：

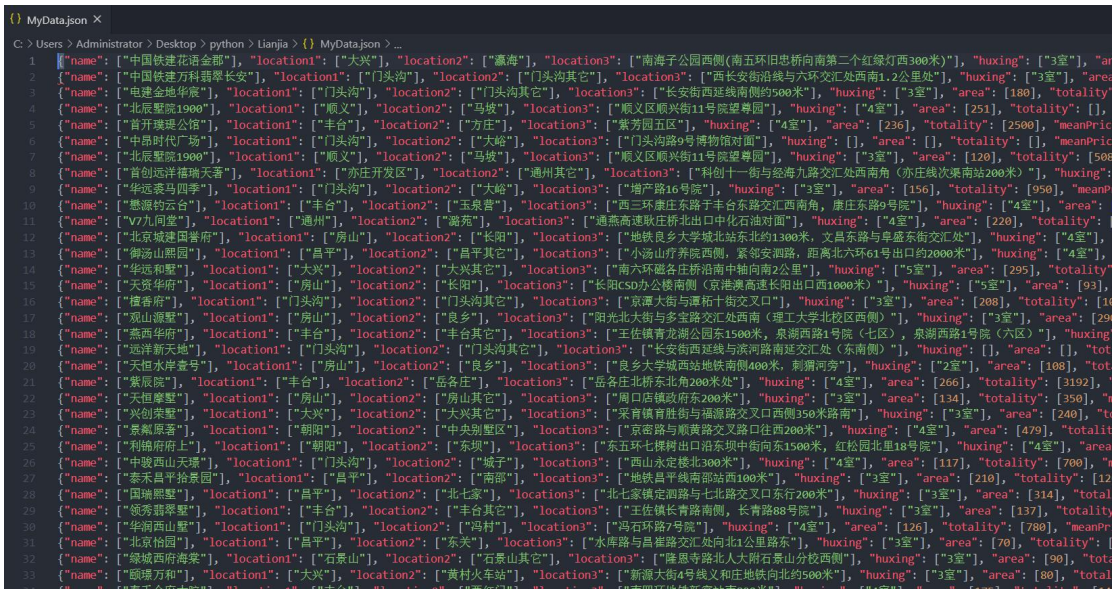
1. 核心代码:

我们在爬虫的时候就进行数据预处理，采用正则表达式的方法获取数据:

```
    def parse(self,response):
        item=MyItem()
        for each in response.xpath("/html/body/div[4]/ul[2]/*"):

            item['name']=each.xpath("a/@title").extract()
            item['location1']=each.xpath("div/div[2]/span[1]/text()").extract()
            item['location2'] = each.xpath("div/div[2]/span[2]/text()").extract()
            item['location3'] = each.xpath("div/div[2]/a/text()").extract()
            item['huxing']=each.xpath("div/a/span[1]/text()").extract()
            item['area']=each.xpath("div/div[3]/span/text()").extract()
            item['totality']=each.xpath("div/div[6]/div[2]/text()").extract();
            item['meanPrice']=each.xpath("div/div[6]/div[1]/span[1]/text()").extract()
            if(item['area']):
                match1=re.search(r'[0-9]+',item['area'][0])
                if match1:
                    item['area'][0]=eval(match1.group(0))
            if(item['totality']):
                match1=re.search(r'[0-9]+',item['totality'][0])
                if match1:
                    item['totality'][0]=eval(match1.group(0))
            if(item['meanPrice']):
                match1=re.search(r'[0-9]+',item['meanPrice'][0])
                if match1:
                    item['meanPrice'][0]=eval(match1.group(0))
                if(item['meanPrice'][0]<10000):
    #在北京不可能有低于 10000 元/平的房子，如果有，那一定是单位搞错了
                    item['meanPrice'][0]=round(item['totality'][0]*10000/item['area'][0],4)
            yield(item)
```

2. 爬取后的 csv 文件截图:



	A	B	C	D	E	F	G	H
10	华远裘马四季	门头沟	大峪	增产路16号院	3室	156	950	60000
11	懋源钓云台	丰台	玉泉营	西三环康庄东路	4室	251	3263	130000
12	V7九间堂	通州	潞苑	通燕高速耿庄桥	4室	220	1700	77272.7273
13	北京城建国誉府	房山	长阳	地铁良乡大学城	4室	143	1000	48000
14	御汤山熙园	昌平	昌平其它	小汤山疗养院西	4室	300	1800	60000
15	华远和墅	大兴	大兴其它	南六环磁各庄桥	5室	295	1580	53559.322
16	天资华府	房山	长阳	长阳CSD办公楼南	5室	93		42000
17	檀香府	门头沟	门头沟其它	京潭大街与潭柘	3室	208	1060	55000
18	观山源墅	房山	良乡	阳光北大街与多	3室	290	1200	47500
19	燕西华府	丰台	丰台其它	王佐镇青龙湖公	4室	60	650	49800
20	远洋新天地	门头沟	门头沟其它	长安街西延线与滨河路南延交汇处（东南侧）				70000
21	天恒水岸壹号	房山	良乡	良乡大学城西站	2室	108	500	46296.2963
22	紫辰院	丰台	岳各庄	岳各庄北桥东北	4室	266	3192	120000
23	天恒摩墅	房山	房山其它	周口店镇政府东	3室	134	350	26119.403
24	兴创荣墅	大兴	大兴其它	采育镇育胜街与	3室	240	850	35416.6667
25	景粼原著	朝阳	中央别墅区	京密路与顺黄路	4室	479	4000	83507.3069
26	利锦府府上	朝阳	东坝	东五环七棵树出	4室	280	1700	60000
27	中骏西山天璟	门头沟	城子	西山永定楼北30	4室	117	700	65000
28	泰禾昌平拾景园	昌平	南邵	地铁昌平线南邵	3室	210	1200	57142.8571
29	国瑞熙墅	昌平	北七家	北七家镇定泗路	3室	314	1500	47770.7006
30	领秀翡翠墅	丰台	丰台其它	王佐镇长青路南	3室	137	668	51000
31	华润西山墅	门头沟	冯村	冯石环路7号院	4室	126	780	61904.7619
32	北京怡园	昌平	东关	水库路与昌崔路	3室	70	430	46000

PM 指数分析：

源代码：

```
import numpy as np
import pandas as pd
import time
import matplotlib.pyplot as plt
#1.打开 CSV 文件
fileNameStr = 'BeijingPM20100101_20151231.csv'
df = pd.read_csv(fileNameStr,encoding='utf-8',dtype=str)
#2010 0101 - 2015 1231
#6 年 12 个月
```

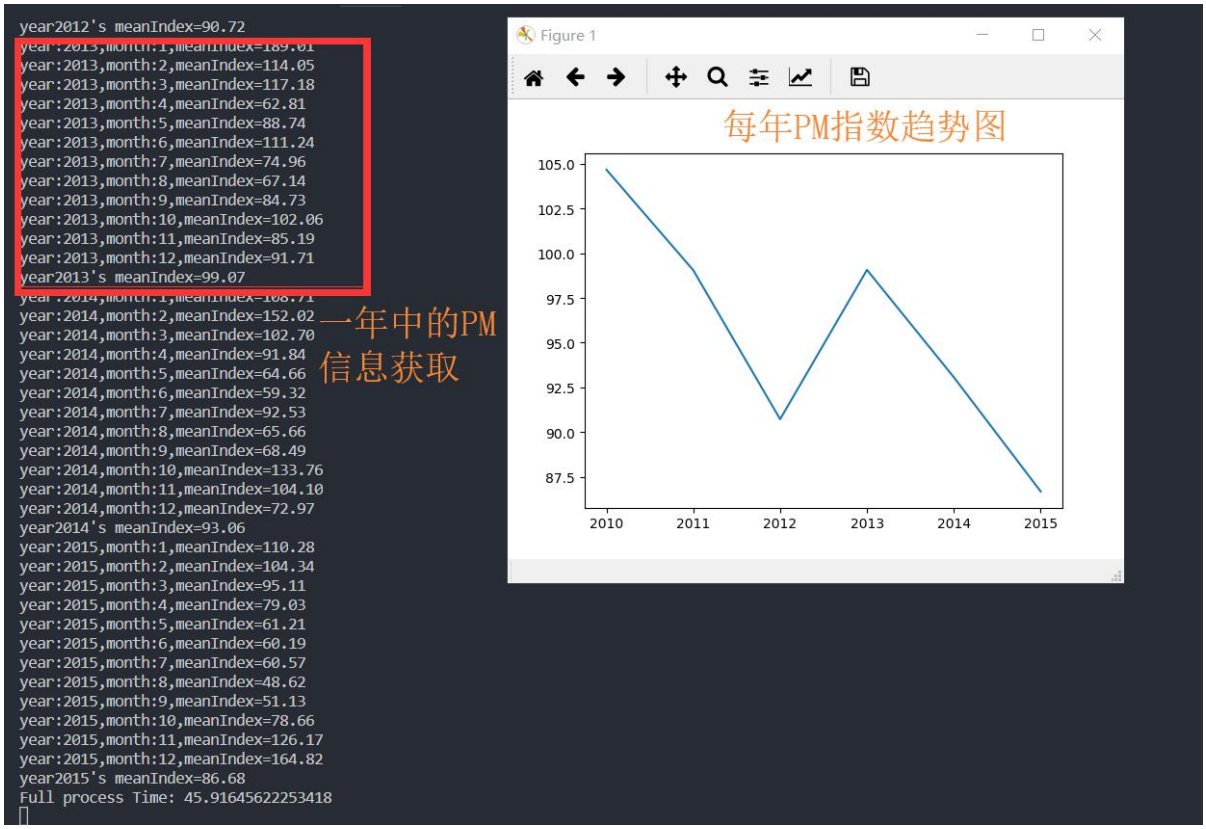
```
    print("info=================================================================
========")
    print(df.info())
    print("=====================================")
    start = time.time()
    account=[[0 for i in range(13)] for j in range(6)]
    counters=[[0 for i in range(13)] for j in range(6)]
    for i in range(52584):
        if(eval(df['year'][i])==2010):
            if not(df['PM_Dongsi'][i] is np.nan):
                account[0][eval(df['month'][i])]+=int(df['PM_Dongsi'][i])
                counters[0][eval(df['month'][i])]+=1
            if not (df['PM_Dongsihuan'][i] is np.nan):
                account[0][eval(df['month'][i])]+=int(df['PM_Dongsihuan'][i])
                counters[0][eval(df['month'][i])]+=1
            if not(df['PM_Nongzhanguan'][i] is np.nan):
                account[0][eval(df['month'][i])]+=int(df['PM_Nongzhanguan'][i])
                counters[0][eval(df['month'][i])]+=1
            if not(df['PM_US Post'][i] is np.nan):
                account[0][eval(df['month'][i])]+=int(df['PM_US Post'][i])
                counters[0][eval(df['month'][i])]+=1
        elif(eval(df['year'][i])==2011):
            if not(df['PM_Dongsi'][i] is np.nan):
                account[1][eval(df['month'][i])]+=int(df['PM_Dongsi'][i])
                counters[1][eval(df['month'][i])]+=1
            if not (df['PM_Dongsihuan'][i] is np.nan):
                account[1][eval(df['month'][i])]+=int(df['PM_Dongsihuan'][i])
                counters[1][eval(df['month'][i])]+=1
            if not(df['PM_Nongzhanguan'][i] is np.nan):
                account[1][eval(df['month'][i])]+=int(df['PM_Nongzhanguan'][i])
                counters[1][eval(df['month'][i])]+=1
            if not(df['PM_US Post'][i] is np.nan):
                account[1][eval(df['month'][i])]+=int(df['PM_US Post'][i])
                counters[1][eval(df['month'][i])]+=1
        elif(eval(df['year'][i])==2012):
            if not(df['PM_Dongsi'][i] is np.nan):
                account[2][eval(df['month'][i])]+=int(df['PM_Dongsi'][i])
                counters[2][eval(df['month'][i])]+=1
            if not (df['PM_Dongsihuan'][i] is np.nan):
                account[2][eval(df['month'][i])]+=int(df['PM_Dongsihuan'][i])
                counters[2][eval(df['month'][i])]+=1
            if not(df['PM_Nongzhanguan'][i] is np.nan):
                account[2][eval(df['month'][i])]+=int(df['PM_Nongzhanguan'][i])
                counters[2][eval(df['month'][i])]+=1
```

```
            if not(df['PM_US Post'][i] is np.nan):
                account[2][eval(df['month'][i])]+=int(df['PM_US Post'][i])
                counters[2][eval(df['month'][i])]+=1
        elif(eval(df['year'][i])==2013):
            if not(df['PM_Dongsi'][i] is np.nan):
                account[3][eval(df['month'][i])]+=int(df['PM_Dongsi'][i])
                counters[3][eval(df['month'][i])]+=1
            if not (df['PM_Dongsihuan'][i] is np.nan):
                account[3][eval(df['month'][i])]+=int(df['PM_Dongsihuan'][i])
                counters[3][eval(df['month'][i])]+=1
            if not(df['PM_Nongzhanguan'][i] is np.nan):
                account[3][eval(df['month'][i])]+=int(df['PM_Nongzhanguan'][i])
                counters[3][eval(df['month'][i])]+=1
            if not(df['PM_US Post'][i] is np.nan):
                account[3][eval(df['month'][i])]+=int(df['PM_US Post'][i])
                counters[3][eval(df['month'][i])]+=1
        elif(eval(df['year'][i])==2014):
            if not(df['PM_Dongsi'][i] is np.nan):
                account[4][eval(df['month'][i])]+=int(df['PM_Dongsi'][i])
                counters[4][eval(df['month'][i])]+=1
            if not (df['PM_Dongsihuan'][i] is np.nan):
                account[4][eval(df['month'][i])]+=int(df['PM_Dongsihuan'][i])
                counters[4][eval(df['month'][i])]+=1
            if not(df['PM_Nongzhanguan'][i] is np.nan):
                account[4][eval(df['month'][i])]+=int(df['PM_Nongzhanguan'][i])
                counters[4][eval(df['month'][i])]+=1
            if not(df['PM_US Post'][i] is np.nan):
                account[4][eval(df['month'][i])]+=int(df['PM_US Post'][i])
                counters[4][eval(df['month'][i])]+=1
        elif(eval(df['year'][i])==2015):
            if not(df['PM_Dongsi'][i] is np.nan):
                account[5][eval(df['month'][i])]+=int(df['PM_Dongsi'][i])
                counters[5][eval(df['month'][i])]+=1
            if not (df['PM_Dongsihuan'][i] is np.nan):
                account[5][eval(df['month'][i])]+=int(df['PM_Dongsihuan'][i])
                counters[5][eval(df['month'][i])]+=1
            if not(df['PM_Nongzhanguan'][i] is np.nan):
                account[5][eval(df['month'][i])]+=int(df['PM_Nongzhanguan'][i])
                counters[5][eval(df['month'][i])]+=1
            if not(df['PM_US Post'][i] is np.nan):
                account[5][eval(df['month'][i])]+=int(df['PM_US Post'][i])
                counters[5][eval(df['month'][i])]+=1


    list_year=[]
```

```
    for i in range(6):
        sumt=0
        for j in range(1,13):
            print("year:{},month:{},meanIndex={:.2f}".format(i+2010,j,account[i][j]/counters[i][j]))
            sumt+=account[i][j]/counters[i][j]
        print("year{}'s meanIndex={:.2f}".format(i+2010,sumt/12))
        list_year.append(round(sumt,2)/12)
    print("Full process Time:",time.time()-start)
    year=[2010,2011,2012,2013,2014,2015]
    #调用 plt.plot 来画图,横轴纵轴两个参数即可
    plt.plot(year,list_year)
    plt.title=("Year Trend Graph")
    # 用 show 展现出来图
    plt.show()
```

运行结果：




```
info=============================================================
====================
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 52584 entries, 0 to 52583
Data columns (total 18 columns):
No                      52584 non-null object
year                    52584 non-null object
```

```
month                 52584 non-null object
day                   52584 non-null object
hour                  52584 non-null object
season                52584 non-null object
PM_Dongsi             25052 non-null object
PM_Dongsihuan         20508 non-null object
PM_Nongzhanguan       24931 non-null object
PM_US Post            50387 non-null object
DEWP                  52579 non-null object
HUMI                  52245 non-null object
PRES                  52245 non-null object
TEMP                  52579 non-null object
cbwd                  52579 non-null object
Iws                   52579 non-null object
precipitation         52100 non-null object
Iprec                 52100 non-null object
dtypes: object(18)
memory usage: 7.2+ MB
None
=======================================
year:2010,month:1,meanIndex=90.40
year:2010,month:2,meanIndex=97.24
year:2010,month:3,meanIndex=94.05
year:2010,month:4,meanIndex=80.07
year:2010,month:5,meanIndex=87.07
year:2010,month:6,meanIndex=109.04
year:2010,month:7,meanIndex=123.43
year:2010,month:8,meanIndex=97.68
year:2010,month:9,meanIndex=122.79
year:2010,month:10,meanIndex=118.78
year:2010,month:11,meanIndex=138.38
year:2010,month:12,meanIndex=97.12
year2010's meanIndex=104.67
year:2011,month:1,meanIndex=44.87
year:2011,month:2,meanIndex=150.29
year:2011,month:3,meanIndex=57.99
year:2011,month:4,meanIndex=91.72
year:2011,month:5,meanIndex=65.11
year:2011,month:6,meanIndex=108.79
year:2011,month:7,meanIndex=107.39
year:2011,month:8,meanIndex=103.73
year:2011,month:9,meanIndex=94.97
year:2011,month:10,meanIndex=145.56
year:2011,month:11,meanIndex=109.43
```

year:2011,month:12,meanIndex=108.72
year2011's meanIndex=99.05
year:2012,month:1,meanIndex=118.92
year:2012,month:2,meanIndex=84.44
year:2012,month:3,meanIndex=96.47
year:2012,month:4,meanIndex=87.84
year:2012,month:5,meanIndex=90.97
year:2012,month:6,meanIndex=96.63
year:2012,month:7,meanIndex=80.65
year:2012,month:8,meanIndex=81.17
year:2012,month:9,meanIndex=59.95
year:2012,month:10,meanIndex=94.95
year:2012,month:11,meanIndex=87.44
year:2012,month:12,meanIndex=109.19
year2012's meanIndex=90.72
year:2013,month:1,meanIndex=189.01
year:2013,month:2,meanIndex=114.05
year:2013,month:3,meanIndex=117.18
year:2013,month:4,meanIndex=62.81
year:2013,month:5,meanIndex=88.74
year:2013,month:6,meanIndex=111.24
year:2013,month:7,meanIndex=74.96
year:2013,month:8,meanIndex=67.14
year:2013,month:9,meanIndex=84.73
year:2013,month:10,meanIndex=102.06
year:2013,month:11,meanIndex=85.19
year:2013,month:12,meanIndex=91.71
year2013's meanIndex=99.07
year:2014,month:1,meanIndex=108.71
year:2014,month:2,meanIndex=152.02
year:2014,month:3,meanIndex=102.70
year:2014,month:4,meanIndex=91.84
year:2014,month:5,meanIndex=64.66
year:2014,month:6,meanIndex=59.32
year:2014,month:7,meanIndex=92.53
year:2014,month:8,meanIndex=65.66
year:2014,month:9,meanIndex=68.49
year:2014,month:10,meanIndex=133.76
year:2014,month:11,meanIndex=104.10
year:2014,month:12,meanIndex=72.97
year2014's meanIndex=93.06
year:2015,month:1,meanIndex=110.28
year:2015,month:2,meanIndex=104.34
year:2015,month:3,meanIndex=95.11

year:2015,month:4,meanIndex=79.03
year:2015,month:5,meanIndex=61.21
year:2015,month:6,meanIndex=60.19
year:2015,month:7,meanIndex=60.57
year:2015,month:8,meanIndex=48.62
year:2015,month:9,meanIndex=51.13
year:2015,month:10,meanIndex=78.66
year:2015,month:11,meanIndex=126.17
year:2015,month:12,meanIndex=164.82
year2015's meanIndex=86.68
Full process Time: 45.91645622253418