数据可视化

数据没有经过处理，那么他就只是一堆数据。

如果可能够将数据进行可视化操作，那数据它就可以很轻松的说明问题啦。

0. 准备工作

绘图工具：

基于`Python`

`pyecharts`，这里主要使用`pyecharts`去一个简单的介绍。

`matplotib`，底层，学习需要一定成本

`seaborn`，对`matplotib`的一个封装。

[pyecharts官方文档：http://gallery.pyecharts.org/#/](http://gallery.pyecharts.org/#/)

0.1 模块安装

> pip install `pyecharts`
>
> pip install jupyter notebook
>
> pip install jupyter notebook==6.1.0 版本控制
>
> 运行采用：jupyter notebook

0.2 数据获取

- 八仙过海，各显神通
- 视频中示例的数据我会提供给到你。

1. 数据预处理（数据清洗

主要使用`pandas`模块，

1.导入模块：pip install pandas

pip install openpyxl

2.路径写入：jupyter notebook

3.新建一个文件

4.编写代码

清理空值

去除重复项

将数据处理一致等，

以下两篇文章是我在CSDN写的博文，对于简单的数据清洗，不妨一看。

[遇到“脏乱差”的Excel数据怎么办？？利用Python规范Excel表格数据（数据清洗）]

[【数据分析】Python分析淘宝4200款Bra，发现最好卖的款式居然是。。。]

导入模块：

```
import pandas as pd

# 打开文档
df = pd.read_excel('taobao_goods.xlsx')
```

删除重复的行：

```
# 删除行完全一样的值
df.drop_duplicates(inplace=True)
# 删除列重复的值
df.drop_duplicates(subset=['列名','列名'])
```

对地理位置进行处理：

```
location_list = []
for location in df['location']:
    location = location.split(' ')[0]
    location_list.append(location)
df['location'] = location_list
```

对销售量进行处理：

```
sales_list = []
for sale in df['sales']:
    sale = sale[:-3].replace('+', '')
    if '万' in sale:
        sale = int(float(sale.replace('万', '')) * 10000)
    sales_list.append(sale)

df['sales'] = sales_list
```

保存为新的表格：

```
df.to_excel('new_taobao_goods.xlsx',index=None)
```

In [4]:
```
import pandas as pd;
```

In [5]:
```
df_tb = pd.read_excel('taobao_goods.xlsx')
```

In [6]:
```
df_tb
```

Out[6]:

	title	price	location	sales	comment_url
0	内衣套装女收副乳调整型防下垂性感聚拢上托	148.0	广东 广州	1107人付款	NaN
1	内衣套装女夏小胸文胸聚拢收副乳少女无钢圈性感蕾丝薄款透气胸罩	19.9	广东 汕头	2114人付款	//detail.tmall.com/item.htm?id=572608443038&ad...
2	女士内衣女无钢圈聚拢小胸收副乳上托性感薄款胸罩调整型文胸套装	129.0	广东 汕头	3852人付款	//detail.tmall.com/item.htm?id=586829143080&ad...
3	遮大胸显小全罩杯超薄文胸 性感蕾丝大码胸罩无海绵薄款内衣女	125.0	安徽 芜湖	3766人付款	//detail.tmall.com/item.htm?id=20762164858&ns=...
4	NEIWAI内外杜鹃同款零敏罗纹三角棉质小胸内衣女无钢圈文胸	199.0	上海	1873人付款	//detail.tmall.com/item.htm?id=586985593346&ns...
...	...	...	...	...	...
4223	天天特价正品贵夫人文胸FA8368光面无钢圈B薄内衣胸罩夏纯色睡眠	43.0	上海	181人付款	//item.taobao.com/item.htm?id=45155943346&ns=1...
4224	古炫酒红色无痕内衣女套装小胸厚聚拢无钢圈胸罩性感文胸内裤一套	59.9	广东 佛山	116人付款	//detail.tmall.com/item.htm?id=601203639372&ns...
4225	运动内衣女防震跑步聚拢减震背心式大胸显小健身薄款学生定型文胸	49.0	广东 揭阳	304人付款	//item.taobao.com/item.htm?id=596530839560&ns=...
4226	大码运动内衣女防震跑步聚拢减震健身瑜伽无钢圈品牌前扣拉链文胸	89.0	广东 中山	104人付款	//detail.tmall.com/item.htm?id=42948120392&ns=...
4227	大码运动内衣女防震聚拢胖mm妹妹文胸跑步背心大胸显小200斤夏季	59.0	广东 广州	213人付款	//item.taobao.com/item.htm?id=58580107885&ns=...

4228 rows × 5 columns

In [7]:
```
df_tb.drop_duplicates(inplace=True)
```

In [8]:
```
df_tb
```

Out[8]:

	title	price	location	sales	comment_url
0	内衣套装女收副乳调整型防下垂性感聚拢上托	148.0	广东 广州	1107人付款	NaN
1	内衣套装女夏小胸文胸聚拢收副乳少女无钢圈性感蕾丝薄款透气胸罩	19.9	广东 汕头	2114人付款	//detail.tmall.com/item.htm?id=572608443038&ad...
2	女士内衣女无钢圈聚拢小胸收副乳上托性感薄款胸罩调整型文胸套装	129.0	广东 汕头	3852人付款	//detail.tmall.com/item.htm?id=586829143080&ad...
3	遮大胸显小全罩杯超薄文胸 性感蕾丝大码胸罩无海绵薄款内衣女	125.0	安徽 芜湖	3766人付款	//detail.tmall.com/item.htm?id=20762164858&ns=...
4	NEIWAI内外杜鹃同款零敏罗纹三角棉质小胸内衣女无钢圈文胸	199.0	上海	1873人付款	//detail.tmall.com/item.htm?id=586985593346&ns...
...	...	...	...	...	...
4223	天天特价正品贵夫人文胸FA8368光面无钢圈B薄内衣胸罩夏纯色睡眠	43.0	上海	181人付款	//item.taobao.com/item.htm?id=45155943346&ns=1...
4224	古炫酒红色无痕内衣女套装小胸厚聚拢无钢圈胸罩性感文胸内裤一套	59.9	广东 佛山	116人付款	//detail.tmall.com/item.htm?id=601203639372&ns...
4225	运动内衣女防震跑步聚拢减震背心式大胸显小健身薄款学生定型文胸	49.0	广东 揭阳	304人付款	//item.taobao.com/item.htm?id=596530839560&ns=...
4226	大码运动内衣女防震跑步聚拢减震健身瑜伽无钢圈品牌前扣拉链文胸	89.0	广东 中山	104人付款	//detail.tmall.com/item.htm?id=42948120392&ns=...
4227	大码运动内衣女防震聚拢胖mm妹妹文胸跑步背心大胸显小200斤夏季	59.0	广东 广州	213人付款	//item.taobao.com/item.htm?id=58580107885&ns=...

4171 rows × 5 columns

In [9]:
```
df_tb['location']
```

Out[9]:
```
0       广东 广州
1       广东 汕头
2       广东 汕头
3       安徽 芜湖
4          上海
        ...
4223       上海
4224    广东 佛山
4225    广东 揭阳
4226    广东 中山
4227    广东 广州
Name: location, Length: 4171, dtype: object
```

In [10]:
```
# 清洗地址
location_list = []
for location in df_tb['location']:
    location_list.append(location.split(' ')[0]);
```

In [11]:
```
location_list
```

```
'浙江',
'广东',
'广东',
'广东',
'上海',
'陕西',
'浙江',
'浙江',
'江西',
'广东',
'广东',
'陕西',
'广东',
'广东',
'江苏',
'广东',
'广东',
'广东',
'浙江',
'广东',
'广东',
'广东',
'福建',
'浙江',
'广东',
'广东',
'广东',
'广东',
'广东',
'广东',
'广东',
'广东',
'广东',
'江西',
'广东',
'广东',
'浙江',
'广东',
```

```
    '北京',
    '安徽',
    '北京'
```

In [12]:
```
df_tb
```

Out[12]:

	title	price	location	sales	comment_url
0	内衣套装女收副乳调整型防下垂性感聚拢上托	148.0	广东 广州	1107人付款	NaN
1	内衣套装女夏小胸文胸聚拢收副乳少女无钢圈性感蕾丝薄款透气胸罩	19.9	广东 汕头	2114人付款	//detail.tmall.com/item.htm?id=572608443038&ad...
2	女士内衣女无钢圈聚拢小胸收副乳上托性感薄款胸罩调整型文胸套装	129.0	广东 汕头	3852人付款	//detail.tmall.com/item.htm?id=586829143080&ad...
3	遐大胸显小全罩杯超薄文胸 性感蕾丝大码胸罩无海绵薄款内衣女	125.0	安徽 芜湖	3766人付款	//detail.tmall.com/item.htm?id=20762164858&ns=...
4	NEIWAI内外杜鹃同款零敏罗纹三角棉质小胸内衣女无钢圈文胸	199.0	上海	1873人付款	//detail.tmall.com/item.htm?id=586985593346&ns...
...	...	...	...	...	...
4223	天天特价正品贵夫人文胸FA8368光面无钢圈B薄内衣胸罩夏纯色睡眠	43.0	上海	181人付款	//item.taobao.com/item.htm?id=45155943346&ns=1...
4224	古炫酒红色无痕内衣女套装小胸厚聚拢无钢圈胸罩性感文胸内裤一套	59.9	广东 佛山	116人付款	//detail.tmall.com/item.htm?id=601203639372&ns...
4225	运动内衣女防震跑步聚拢减震背心式大胸显小健身薄款学生定型文胸	49.0	广东 揭阳	304人付款	//item.taobao.com/item.htm?id=596530839560&ns=...
4226	大码运动内衣女防震跑步聚拢减震健身瑜伽无钢圈品牌前扣拉链文胸	89.0	广东 中山	104人付款	//detail.tmall.com/item.htm?id=42948120392&ns=...
4227	大码运动内衣女防震聚拢胖mm妹妹文胸跑步背心大胸显小200斤夏季	59.0	广东 广州	213人付款	//item.taobao.com/item.htm?id=585807107885&ns=...

4171 rows × 5 columns

In [13]:
```
df_tb['location'] = location_list
```

In [14]:
```
df_tb
```

Out[14]:

	title	price	location	sales	comment_url
0	内衣套装女收副乳调整型防下垂性感聚拢上托	148.0	广东	1107人付款	NaN
1	内衣套装女夏小胸文胸聚拢收副乳少女无钢圈性感蕾丝薄款透气胸罩	19.9	广东	2114人付款	//detail.tmall.com/item.htm?id=572608443038&ad...
2	女士内衣女无钢圈聚拢小胸收副乳上托性感薄款胸罩调整型文胸套装	129.0	广东	3852人付款	//detail.tmall.com/item.htm?id=586829143080&ad...
3	遐大胸显小全罩杯超薄文胸 性感蕾丝大码胸罩无海绵薄款内衣女	125.0	安徽	3766人付款	//detail.tmall.com/item.htm?id=20762164858&ns=...
4	NEIWAI内外杜鹃同款零敏罗纹三角棉质小胸内衣女无钢圈文胸	199.0	上海	1873人付款	//detail.tmall.com/item.htm?id=586985593346&ns...
...	...	...	...	...	...
4223	天天特价正品贵夫人文胸FA8368光面无钢圈B薄内衣胸罩夏纯色睡眠	43.0	上海	181人付款	//item.taobao.com/item.htm?id=45155943346&ns=1...
4224	古炫酒红色无痕内衣女套装小胸厚聚拢无钢圈胸罩性感文胸内裤一套	59.9	广东	116人付款	//detail.tmall.com/item.htm?id=601203639372&ns...
4225	运动内衣女防震跑步聚拢减震背心式大胸显小健身薄款学生定型文胸	49.0	广东	304人付款	//item.taobao.com/item.htm?id=596530839560&ns=...
4226	大码运动内衣女防震跑步聚拢减震健身瑜伽无钢圈品牌前扣拉链文胸	89.0	广东	104人付款	//detail.tmall.com/item.htm?id=42948120392&ns=...
4227	大码运动内衣女防震聚拢胖mm妹妹文胸跑步背心大胸显小200斤夏季	59.0	广东	213人付款	//item.taobao.com/item.htm?id=585807107885&ns=...

4171 rows × 5 columns

In [15]:
```
# 清洗金额
sales_list = []
for sale in df_tb['sales']:
    sale = sale[:-3].replace('+','');
    if '万' in sale:
        sale = int(float(sale[:-1])*10000);
    sales_list.append(sale);
```

In [16]:
```
df_tb['sales'] = sales_list;
```

In [18]:
```
df_tb
```

Out[18]:

	title	price	location	sales	comment_url
0	内衣套装女收副乳调整型防下垂性感聚拢上托	148.0	广东	1107	NaN
1	内衣套装女夏小胸文胸聚拢收副乳少女无钢圈性感蕾丝薄款透气胸罩	19.9	广东	2114	//detail.tmall.com/item.htm?id=572608443038&ad...
2	女士内衣女无钢圈聚拢小胸收副乳上托性感薄款胸罩调整型文胸套装	129.0	广东	3852	//detail.tmall.com/item.htm?id=586829143080&ad...
3	遐大胸显小全罩杯超薄文胸 性感蕾丝大码胸罩无海绵薄款内衣女	125.0	安徽	3766	//detail.tmall.com/item.htm?id=20762164858&ns=...
4	NEIWAI内外杜鹃同款零敏罗纹三角棉质小胸内衣女无钢圈文胸	199.0	上海	1873	//detail.tmall.com/item.htm?id=586985593346&ns...
...	...	...	...	...	...
4223	天天特价正品贵夫人文胸FA8368光面无钢圈B薄内衣胸罩夏纯色睡眠	43.0	上海	181	//item.taobao.com/item.htm?id=45155943346&ns=1...
4224	古炫酒红色无痕内衣女套装小胸厚聚拢无钢圈胸罩性感文胸内裤一套	59.9	广东	116	//detail.tmall.com/item.htm?id=601203639372&ns...
4225	运动内衣女防震跑步聚拢减震背心式大胸显小健身薄款学生定型文胸	49.0	广东	304	//item.taobao.com/item.htm?id=596530839560&ns=...
4226	大码运动内衣女防震跑步聚拢减震健身瑜伽无钢圈品牌前扣拉链文胸	89.0	广东	104	//detail.tmall.com/item.htm?id=42948120392&ns=...
4227	大码运动内衣女防震聚拢胖mm妹妹文胸跑步背心大胸显小200斤夏季	59.0	广东	213	//item.taobao.com/item.htm?id=585807107885&ns=...

4171 rows × 5 columns

In [19]:
```
# 保存到新表
df_tb.to_excel('standard_taobao_goods.xlsx',index=None);
```

In [ ]:
```

```

2. 制作图表

导入模块

```
import jieba
import pandas as pd

from pyecharts import options as opts
from pyecharts.globals import ThemeType
from pyecharts.globals import SymbolType
from pyecharts.charts import Pie, Bar, Map, WordCloud, Page
```

备注：

安装：pip install jieba

2.1 词云

两种方法：

1. `pyecharts`自带的生成词云
2. `wordcloud` 模块生成词云（推荐

方法一：

```
stop_words_txt = 'stop_words.txt'
# 载入停用词,即过滤词
jieba.analyse.set_stop_words(stop_words_txt)
# TextRank 关键词抽取，只获取固定词性
# topK为返回权重最大的关键词，默认值为20
# withWeight为返回权重值，默认为False
keywords_count_list = jieba.analyse.textrank(' '.join(df1.comment), topK=100,
withWeight=True)
print(keywords_count_list)
```

```
word_cloud = (
    WordCloud()
        .add("", keywords_count_list, word_size_range=[5, 50],
             shape=SymbolType.TRIANGLE,
            )
        .set_global_opts(title_opts=opts.TitleOpts(title="这里输入标题"))
)
# 这句话是渲染成一个html文件到当前文件夹下面
#     word_cloud.render('WordCloud.html')
```

方法二：（推荐，可自定义

> pip install `wordcloud`

```
import jieba
import numpy as np
```

```
import matplotlib.pyplot as plt

from PIL import Image
from wordcloud import WordCloud


# 打开文本
# text = open('1.txt',encoding='utf-8').read()

# 中文分词
text = ' '.join(jieba.cut(text))

# 生成对象
mask = np.array(Image.open("input_picture"))
wc =
WordCloud(mask=mask,font_path='C:\Windows\Fonts\SimHei.ttf',mode='RGBA').generat
e(text)

# 显示词云
# plt.imshow(wc, interpolation='bilinear')
# plt.axis("off")
# plt.show()

# 保存到文件
wc.to_file('output_picture')
```

效果:

In [21]:
```
# 词云
df_bra = pd.read_excel(r'D:\个人\A总结资料\14_python\代码\可视化\数据可视化演示\standard_excel\standard_goods_comments.xlsx')  # 读取excel
```

In [22]:
```
df_bra['comment']  # 评论
```

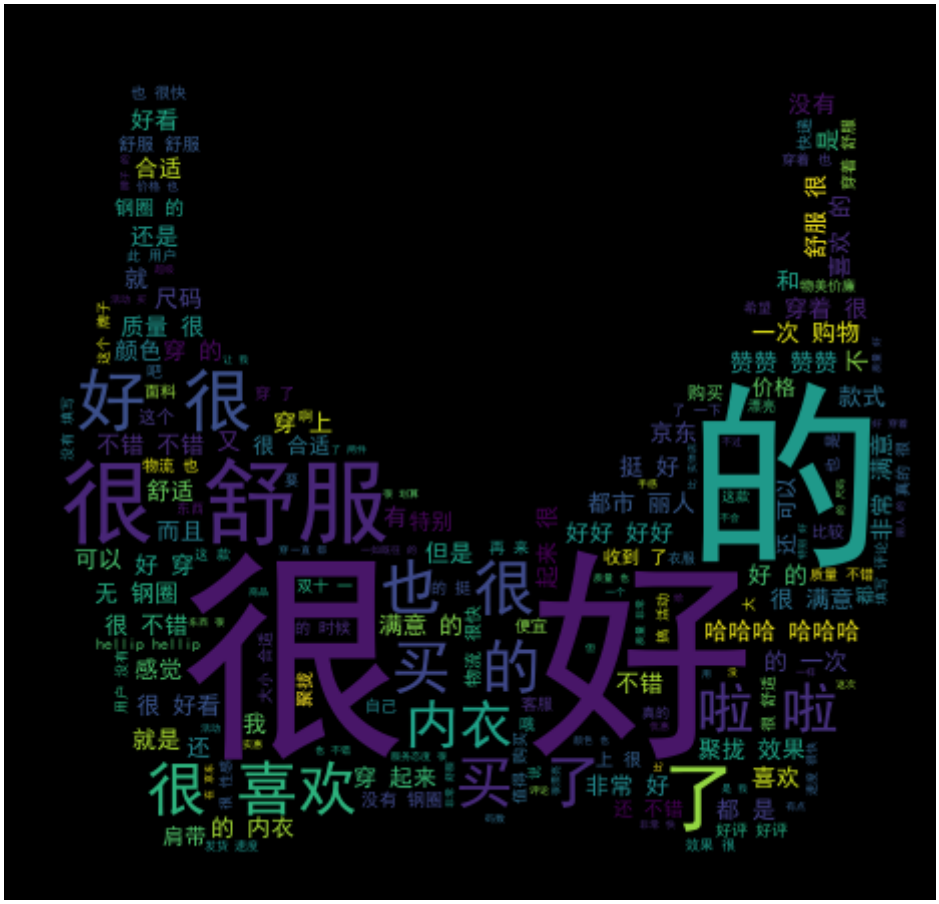
Out[22]:
```
0          每年固定双十一买五套，正好每套两个月，今年这几个颜色更差了，但质量比去年优秀，真的是裸感。
1       不厚无钢圈，第一回买这个牌子，款式好看，买了两件，感觉舒适度一般，懒得退了。。粉色的应该是别...
2       上身效果：很合适 很贴身 厚薄度：适中 尺码推荐：很准确 材质特性：描述一致 罩杯推荐：很准...
3       没有买过VS，自己根据尺码表算的尺寸没想到挺合适。很喜欢这件内衣很薄很透气，没有钢圈午睡也很...
4         终于等到双十一买了4件，维密家的内衣面料是穿过的内衣里面质感最好的，舒服度也很高，无限回购！！
                                ...
3669                          鞋很好，物美价廉物流速度快，这个价位质量还这么好，非常赞?
3670                  昨天下单，今天就到了，京东物流???！质量很好！需要的朋友赶紧下单哦
3671                                非常好，质量不错，大小很合适，卖家态度很好
3672                              穿着很舒服！不错的选择！质量很好！真心喜欢！
3673                          穿着很舒服，质量也很好，活动购 价值66元算便宜了吧！
Name: comment, Length: 3674, dtype: object
```

In [23]:
```
import jieba
import numpy as np
import matplotlib.pyplot as plt  # 画图工具

from PIL import Image  # 图片的
from wordcloud import WordCloud  # 词云


# 打开文本，这种是固定的词语
# text = open('1.txt',encoding='utf-8').read()

# 中文分词
text = ' '.join(jieba.cut(str([comment for comment in df_bra['comment']])))

# 生成对象
mask = np.array(Image.open("bra.jpg"))
wc = WordCloud(mask=mask,font_path='D:\个人\A总结资料\14_python\代码\可视化\数据可视化演示\simhei_158460\simhei.ttf',mode='RGBA').generate

# 显示词云
# plt.imshow(wc, interpolation='bilinear')
# plt.axis("off")
# plt.show()

# 保存到文件
wc.to_file('big_bra.png')
```

```
Building prefix dict from the default dictionary ...
Dumping model to file cache C:\Users\Huawei\AppData\Local\Temp\jieba.cache
Loading model cost 1.770 seconds.
Prefix dict has been built successfully.
```

Out[23]:
```
<wordcloud.wordcloud.WordCloud at 0x246c09d4550>
```

In [ ]:



2.2 柱状图

一般柱状图：

```
bar = (
    Bar()
    .add_xaxis(Faker.days_attrs)
    .add_yaxis("商家A", Faker.days_values)
    .set_global_opts(
        title_opts=opts.TitleOpts(title="Bar-DataZoom（slider+inside）"),
    )
#     .render("bar_datazoom_both.html")
)
```

横向柱状图：

```
.reversal_axis()
.set_series_opts(label_opts=opts.LabelOpts(position="right"))
```

滑块柱状图：

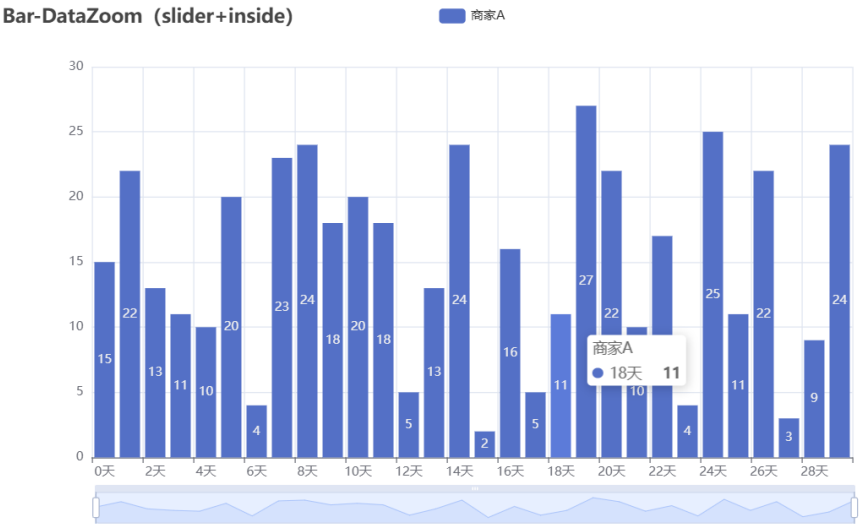
```
datazoom_opts=[opts.DataZoomOpts()]
```

代码：

In [34]:
```
# 柱状图
from pyecharts.faker import Faker
bar = (
    Bar()
    .add_xaxis(Faker.days_attrs)
    .add_yaxis("商家A", Faker.days_values)
#     .reversal_axis()
#     .set_series_opts(label_opts=opts.LabelOpts(position="right"))
    .set_global_opts(
        title_opts=opts.TitleOpts(title="Bar-DataZoom（slider+inside）"),
        datazoom_opts=[opts.DataZoomOpts()]
    )
#     .render("bar_datazoom_both.html")
)
```

In [35]:
```
bar.render_notebook()
```

Out[35]:



In [ ]:

2.3 饼图

数据来自：`standard_goods_comments.xlsx`

这里用cup做展示

```
[('B', 1909), ('C', 810), ('A', 696), ('D', 259)]
```

多图显示cup：

```
from pyecharts import options as opts
from pyecharts.charts import Pie
from pyecharts.commons.utils import JsCode


fn = """
    function(params) {
        if(params.name == 'other')
            return '\\n\\n\\n' + params.name + ' : ' + params.value + '%';
        return params.name + ' : ' + params.value + '%';
    }
    """
```

```
def new_label_opts():
    return opts.LabelOpts(formatter=JsCode(fn), position="center")


pie = (
    Pie()
    .add(
        "",
        [['A_cup', round(696/total_cup, 2)*100],['other',round(1 -
696/total_cup, 2)*100]],
        center=["20%", "30%"],
        radius=[60, 80],
        label_opts=new_label_opts(),
    )
    .add(
        "",
        [['B_cup', round(1909/total_cup, 2)*100],['other',round(1 -
1909/total_cup, 2)*100]],
        center=["55%", "30%"],
        radius=[60, 80],
        label_opts=new_label_opts(),
    )
    .add(
        "",
        [['C_cup', round(810/total_cup, 2)*100],['other',round(1 -
810/total_cup, 2)*100]],
        center=["20%", "70%"],
        radius=[60, 80],
        label_opts=new_label_opts(),
    )
    .add(
        "",
        [['D_cup', round(259/total_cup * 100, 1)],['other',round(1 -
259/total_cup, 2)*100]],
        center=["55%", "70%"],
        radius=[60, 80],
        label_opts=new_label_opts(),
    )
    .set_global_opts(
        title_opts=opts.TitleOpts(title="Cup-多饼图"),
        legend_opts=opts.LegendOpts(
            type_="scroll", pos_top="20%", pos_left="80%", orient="vertical"
        ),
    )
#     .render("mutiple_pie.html")
)
```

In [25]:
```
# 饼图
[size for size in df_bra['bra_size'].value_counts().items()]
```

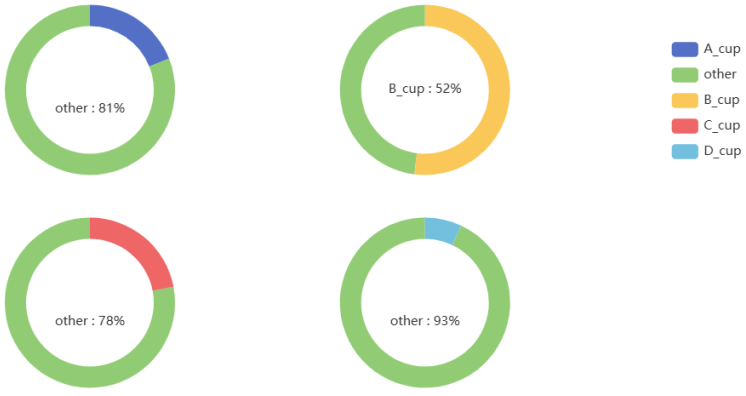
Out[25]:
```
[('B', 1909), ('C', 810), ('A', 696), ('D', 259)]
```

In [26]:
```
total_cup = sum(count[1] for count in [size for size in df_bra['bra_size'].value_counts().items()])
```

In [27]:
```
from pyecharts import options as opts
from pyecharts.charts import Pie
from pyecharts.commons.utils import JsCode


fn = """
    function(params) {
        if(params.name == 'other')
            return '\\n\\n\\n' + params.name + ' : ' + params.value + '%';
        return params.name + ' : ' + params.value + '%';
    }
    """


def new_label_opts():
    return opts.LabelOpts(formatter=JsCode(fn), position="center")


pie = (
    Pie()
    .add(
        "",
        [['A_cup', round(696/total_cup, 2)*100],['other',round(1 - 696/total_cup, 2)*100]],
        center=["20%", "30%"],
        radius=[60, 80],
        label_opts=new_label_opts(),
    )
    .add(
        "",
        [['B_cup', round(1909/total_cup, 2)*100],['other',round(1 - 1909/total_cup, 2)*100]],
        center=["55%", "30%"],
        radius=[60, 80],
        label_opts=new_label_opts(),
    )
    .add(
        "",
        [['C_cup', round(810/total_cup, 2)*100],['other',round(1 - 810/total_cup, 2)*100]],
        center=["20%", "70%"],
        radius=[60, 80],
        label_opts=new_label_opts(),
    )
    .add(
        "",
        [['D_cup', round(259/total_cup * 100, 1)],['other',round(1 - 259/total_cup, 2)*100]],
        center=["55%", "70%"],
        radius=[60, 80],
        label_opts=new_label_opts(),
    )
    .set_global_opts(
        title_opts=opts.TitleOpts(title="Cup-多饼图"),
        legend_opts=opts.LegendOpts(
            type_="scroll", pos_top="20%", pos_left="80%", orient="vertical"
        ),
    )
#     .render("mutiple_pie.html")
)
```

In [28]:
```
pie.render_notebook()
```

Out[28]:



2.3.1 玫瑰图

疫情展示:

```
from pyecharts import options as opts
from pyecharts.charts import Pie
from pyecharts.faker import Faker
```

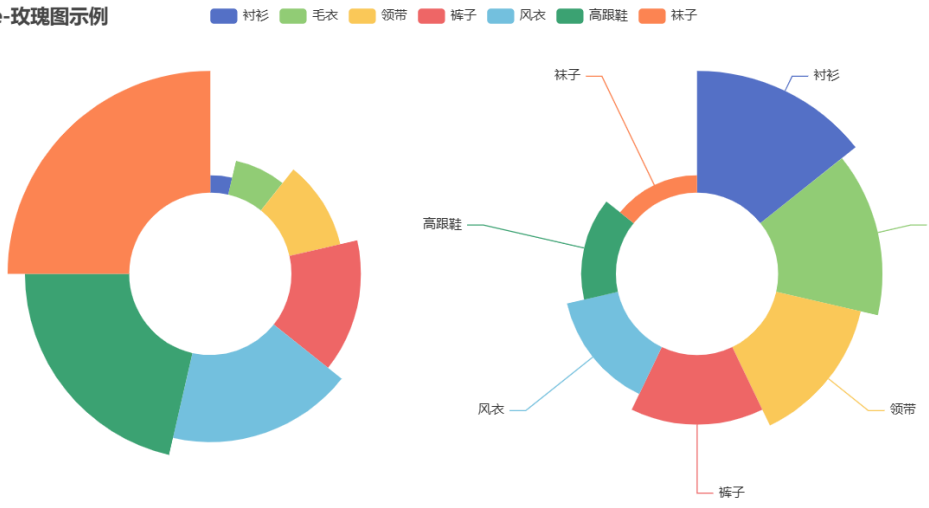
```
v = Faker.choose()
pie = (
    Pie()
    .add(
        "",
        [list(z) for z in zip(v, list(range(10,80,10)))],
        radius=["30%", "75%"],
        center=["25%", "50%"],
        rosetype="radius",
        label_opts=opts.LabelOpts(is_show=False),
    )
    .add(
        "",
        [list(z) for z in zip(v,list(range(10,80,10))[::-1])],
        radius=["30%", "75%"],
        center=["75%", "50%"],
        rosetype="area",
    )
    .set_global_opts(title_opts=opts.TitleOpts(title="Pie-玫瑰图示例"))
)
```

效果图:

In [36]:
```
# 玫瑰图
from pyecharts import options as opts
from pyecharts.charts import Pie
from pyecharts.faker import Faker


v = Faker.choose()
pie1 = (
    Pie()
    .add(
        "",
        [list(z) for z in zip(v, list(range(10,80,10)))],
        radius=["30%", "75%"],
        center=["25%", "50%"],
        rosetype="radius",
        label_opts=opts.LabelOpts(is_show=False),
    )
    .add(
        "",
        [list(z) for z in zip(v,list(range(10,80,10))[::-1])],
        radius=["30%", "75%"],
        center=["75%", "50%"],
        rosetype="area",
    )
    .set_global_opts(title_opts=opts.TitleOpts(title="Pie-玫瑰图示例"))
)
```

In [37]:
```
pie1.render_notebook()
```

Out[37]:



In [ ]:
```
# 水球图
```

2.4 地图

```
from pyecharts import options as opts
from pyecharts.charts import Map
from pyecharts.faker import Faker

map = (
    Map()
    .add("店铺数量",[['广东',100],['广西',100],['湖南',19,]], "china")
    .set_global_opts(
        title_opts=opts.TitleOpts(title="商家店铺地址分布图"),
        visualmap_opts=opts.VisualMapOpts(max_=200),
    )
)
```

图片:

In [52]:
```
# 保存到新表
df_tb.to_excel('standard_taobao_goods.xlsx',index=None);
```

In [53]:
```
# 获取每个地区出现了多少次
locations = [location for location in df_tb['location'].value_counts().items()];
```

In [54]:
```
locations
```

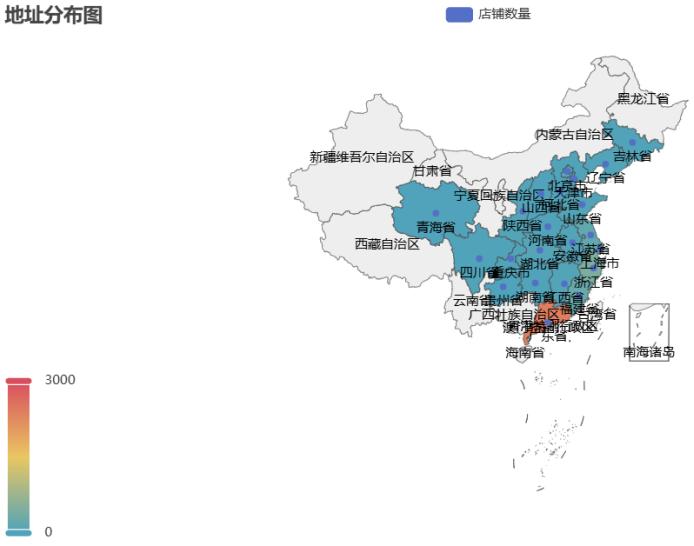
Out[54]:
```
[('广东省', 2398),
 ('上海市', 555),
 ('浙江省', 423),
 ('福建省', 238),
 ('江苏省', 184),
 ('北京市', 50),
 ('湖北省', 49),
 ('山东省', 41),
 ('陕西省', 41),
 ('江西省', 38),
 ('安徽省', 36),
 ('辽宁省', 28),
 ('重庆市', 14),
 ('河北省', 10),
 ('四川省', 10),
 ('湖南省', 9),
 ('河南省', 8),
 ('香港省', 7),
 ('美国省', 7),
 ('吉林省', 5),
 ('天津市', 5),
 ('广西省', 4),
 ('青海省', 3),
 ('日本省', 3),
 ('泰国省', 2),
 ('山西省', 1),
 ('法国省', 1),
 ('贵州省', 1)]
```

In [55]:
```
# 导入模块
import jieba;# 分词

from pyecharts import options as opts;
from pyecharts.globals import ThemeType;
from pyecharts.globals import SymbolType;
from pyecharts.charts import Pie, Bar, Map, WordCloud, Page;
from pyecharts.faker import Faker;
```

In [58]:
```
map = (
    Map()
        .add("店铺数量",[list(location) for location in locations],"china")
        .set_global_opts(
            title_opts = opts.TitleOpts(title='地址分布图'),
            visualmap_opts=opts.VisualMapOpts(max_=3000)
#             visualmap_opts = opts.VisualMapOpts(
#                 is_show=True,
#                 is_piecewise=True,
#                 pieces=[
#                     {"min": 1, "max": 500, "label": "1~500人", "color": "#CCFFFF"},
#                     {"min": 501, "max": 1000, "label": "501~1000人", "color": "#FFFF99"},
#                     {"min": 1001, "max": 1500, "label": "1001~1500人", "color": "#FF9966"},
#                     {"min": 1501, "max": 2000, "label": "1501~2000人", "color": "#FF6666"},
#                     {"min": 2001, "max": 2500, "label": "2001~2500人", "color": "#CC3333"},
#                     {"min": 2501,  "label": "2501+人", "color": "#990033"},
#                 ]
#             )
        )
)
# 备注：在这个地方地图并不会显示对应的颜色块，因为省份城市的命名是不规范的，比如市没有填写市，省没写省
# map.render()
```

In [59]:
```
map.render_notebook()
```

Out[59]:



In [ ]:
```
```

2.5 水球图

天气:

```
from pyecharts import options as opts
from pyecharts.charts import Liquid

liquid = (
    Liquid()
    .add("lq", [0.45,0.5])
    # 第一个值为显示的值，第二个值为水的分量
    .set_global_opts(title_opts=opts.TitleOpts(title="今日湿度"))
#     .render("liquid_base.html")
)
```

3. 整合图表

多图表整合

```
Page.save_resize_html('page_draggable_layout.html',cfg_file=
'chart_config.json')
```

In [40]:
```
# 合并
page= Page(layout= Page.DraggablePageLayout)
page.add(
bar,
liquid,
pie,
map,
piel
)
```

Out[40]: <pyecharts.charts.composite_charts.page.Page at 0x246c4ebeb50>

In [41]:
```
page.render_notebook()
```

今日湿度

In [42]:
```
page.render('all1.html')
```

Out[42]: 'D:\\个人\\A总结资料\\14_python\\代码\\可视化\\数据可视化演示\\all1.html'

In [48]:
```
# 这个地方会自动生成一个resize_render.html的文件，就是固定好的
Page.save_resize_html('all1.html',cfg_file= 'chart_config_luo1.json')
```


```
 animationDuration : 1000, \n    animationEasing : "cubicOut", \n    animationDelay : 0, \n    animationDurationUpdate : 300, \n    an
imationEasingUpdate": "cubicOut", \n    "animationDelayUpdate": 0, \n    "aria": {\n        "enabled": false\n    }, \n    "color": [\n
"#5470c6", \n        "#91cc75", \n        "#fac858", \n        "#ee6666", \n        "#73c0de", \n        "#3ba272", \n        "#fc8452", \n
"#9a60b4", \n        "#ea7ccc"\n    ], \n    "series": [\n        {\n            "type": "bar", \n            "name": "\\u5546\\u5bb6
A", \n            "legendHoverLink": true, \n            "data": [\n                15, \n                22, \n                13, \n
11, \n                10, \n                20, \n                4, \n                23, \n                24, \n                18, \n
20, \n                18, \n                5, \n                13, \n                24, \n                2, \n                16, \n
5, \n                11, \n                27, \n                22, \n                10, \n                17, \n                4, \n
25, \n                11, \n                22, \n                3, \n                9, \n                24\n            ], \n
"realtimeSort": false, \n            "showBackground": false, \n            "stackStrategy": "samesign", \n            "cursor": "pointe
r", \n            "barMinHeight": 0, \n            "barCategoryGap": "20%", \n            "barGap": "30%", \n            "large": false, \n
"largeThreshold": 400, \n            "seriesLayoutBy": "column", \n            "datasetIndex": 0, \n            "clip": true, \n
"zlevel": 0, \n            "z": 2, \n            "label": {\n                "show": true, \n                "margin": 8\n            }\n
}\n    ], \n    "legend": [\n        {\n            "data": [\n                "\\u5546\\u5bb6A"\n            ], \n            "selecte
d": {}, \n            "show": true, \n            "padding": 5, \n            "itemGap": 10, \n            "itemWidth": 25, \n
"itemHeight": 14, \n            "backgroundColor": "transparent", \n            "borderColor": "#ccc", \n            "borderRadius": 0, \n
"pageButtonItemGap": 5, \n            "pageButtonPosition": "end", \n            "pageFormatter": "{current}/{total}", \n            "pag
eIconColor": "#2f4554", \n            "pageIconInactiveColor": "#aaa", \n            "pageIconSize": 15, \n            "animationDuration
Update": 800, \n            "selector": false, \n            "selectorPosition": "auto", \n            "selectorItemGap": 7, \n
"selectorButtonGap": 10\n        }\n    ], \n    "tooltip": {\n        "show": true, \n        "trigger": "item", \n        "triggerOn":
"mousemove|click", \n        "axisPointer": {\n            "type": "line"\n        }, \n        "showContent": true, \n        "alwaysSho
wContent": false, \n        "showDelay": 0, \n        "hideDelay": 100, \n        "enterable": false, \n        "confine": false, \n
"appendToBody": false, \n        "transitionDuration": 0.4, \n        "textStyle": {\n            "fontSize": 14\n        }, \n        "b
orderWidth": 0, \n        "padding": 5, \n        "order": "seriesAsc"\n    }, \n    "xAxis": [\n        {\n            "show": true, \n
"scale": false, \n            "nameLocation": "end", \n            "nameGap": 15, \n            "gridIndex": 0, \n            "inverse": f
alse, \n            "offset": 0, \n            "splitNumber": 5, \n            "minInterval": 0, \n            "splitLine": {\n
"show": true, \n                "lineStyle": {\n                    "show": true, \n                    "width": 1, \n
"opacity": 1, \n                    "curveness": 0, \n                    "type": "solid"\n                }\n            }, \n
"data": [\n                "0\\u5929", \n                "1\\u5929", \n                "2\\u5929", \n                "3\\u5929", \n
"4\\u5929", \n                "5\\u5929", \n                "6\\u5929", \n                "7\\u5929", \n                "8\\u5929", \n
"9\\u5929", \n                "10\\u5929", \n                "11\\u5929", \n                "12\\u5929", \n                "13\\u5929", \n
"14\\u5929", \n                "15\\u5929", \n                "16\\u5929", \n                "17\\u5929", \n                "18\\u5929", \n
"19\\u5929", \n                "20\\u5929", \n                "21\\u5929", \n                "22\\u5929", \n                "23\\u5929", \n
"24\\u5929", \n                "25\\u5929", \n                "26\\u5929", \n                "27\\u5929", \n                "28\\u5929", \n
"29\\u5929"\n            ]\n        }\n    ], \n    "yAxis": [\n        {\n            "show": true, \n            "scale": false, \n
```