《数据可视化》

实验手册

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目　录

实验：pyecharts 可视化绘图

【实验概述】

实验类型：应用型

学时要求：1 学时

组织形式：可由 1 名学生单独完成。

【实验目的】

（1） 本课程的目的是能够使学员掌握 pyecharts 可视化图开发。

【实验要求】

（1） 要求学员能够独立完成实验。

【实验环境】

硬件环境：

操作系统 Window，linux

每台计算机内存、 CPU、硬盘无要求

软件：

Python3.6+

Pycharm|Anaconda

Chrome、Firfox 浏览器

【相关知识】

1． Python 语法基础

2． WEB 网站开发相关知识

3． Pyecharts 视化库：

Pyecharts 是一个用于生成 Echarts 图表的类库，是一款将 Python 与 ECharts 相结合的强大的数据可视化工具，

使用 pyecharts 可以让开发者轻松的实现大数据的可视化.

使用 pyecharts 绘制图表的基本语法如下：

from pyecharts import chart_name

add()

render()

from pyecharts import chart_name ：引入 pyecharts 库并定义图表的类型。

add()：添加图表的各项数据。

render()： 将图表生成为可视化的 html 网页

学习官网:https://pyecharts.org/#/zh-cn/intro

4. 【实验内容】

pyecharts 安装

安装：pip install pyecharts==0.1.9.4
执行后，输入以下命令查看：pip show pyecharts

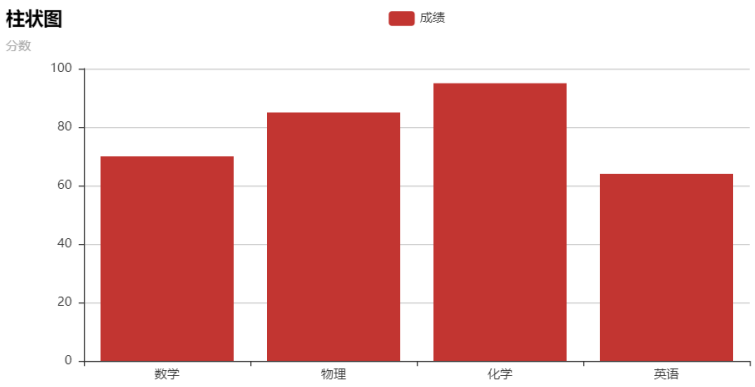
```
(base) C:\WINDOWS\system32>pip show pyecharts
Name: pyecharts
Version: 0.1.9.4
Summary: Python echarts, make charting easier
Home-page: https://github.com/chenjiandongx/pyecharts
Author: chenjiandongx
Author-email: chenjiandongx@qq.com
License: MIT
Location: c:\programdata\anaconda3\lib\site-packages
Requires: jinja2, future, pillow
Required-by:

(base) C:\WINDOWS\system32>
```

安装对应的地图文件包
pip install echarts-countries-pypkg，安装全球国家地图
pip install echarts-china-provinces-pypkg，安装中国省级地图
pip install echarts-china-cities-pypkg，安装中国市级地图

使用 Pycharm 创建工程

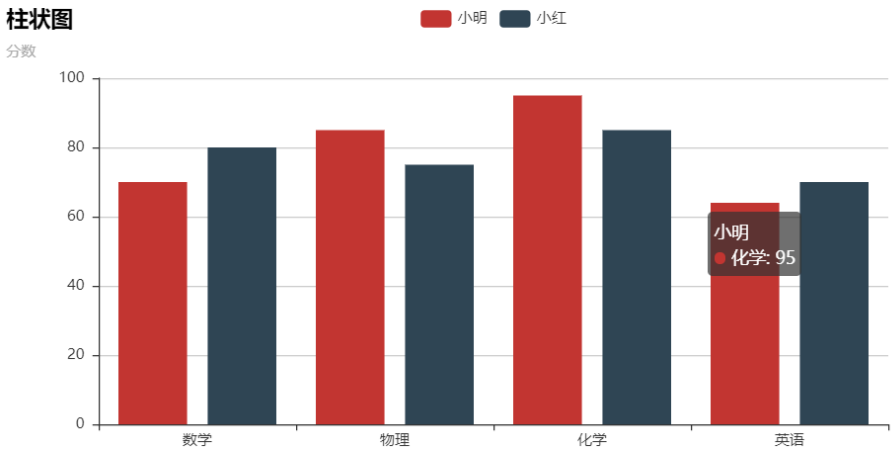
1. 柱状图

```
from pyecharts import Bar
import os
v1 = [70,85,95,64]
str1 = ['数学','物理','化学','英语']
bar1 = Bar('柱状图','分数')
bar1.add('成绩',str1,v1,is_more_utils = True)
bar1.render("render.html")
```



2. 不堆叠的柱状图

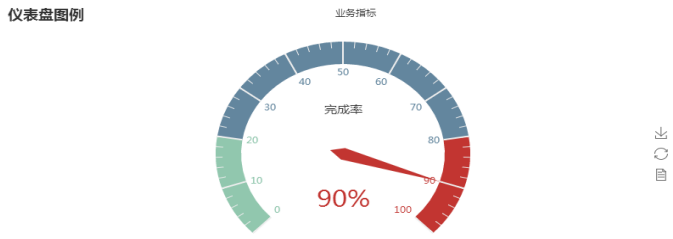
```
v1 = [70, 85, 95, 64]
v2 = [80, 75, 85, 70]
str1 = ['数学','物理','化学','英语']
bar = Bar('柱状图','分数')
bar.add("小明", str1 , v1, is_stack=False)
bar.add("小红", str1 , v2, is_stack=False)
bar.render()
os.system("render.html")
```



3. 绘制仪表盘

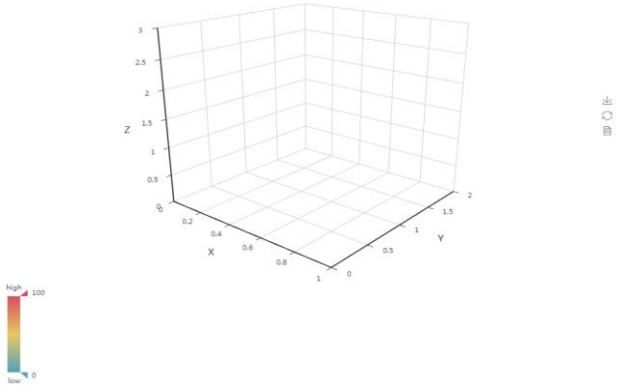
```
from pyecharts import Gauge
gauge = Gauge("仪表盘图例")
gauge.add("业务指标", "完成率", 90)
```

gauge.render()



4. 绘制 3D 图

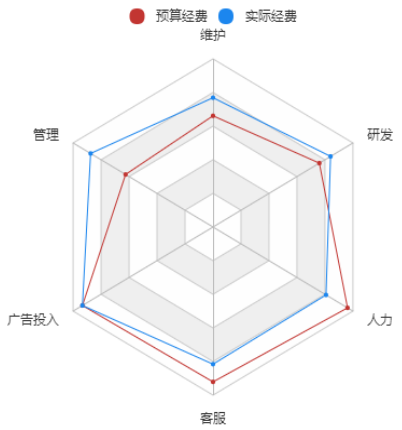
```
from pyecharts import Line3D
data = [[1,2,3,4], [1,2,3,4], [1,2,3,4]]
Line3D = Line3D("3D 折线图示例", width=1000, height=1000)
Line3D.add("", data, is_visualmap=True)
Line3D.render()
```



5. 绘制雷达图

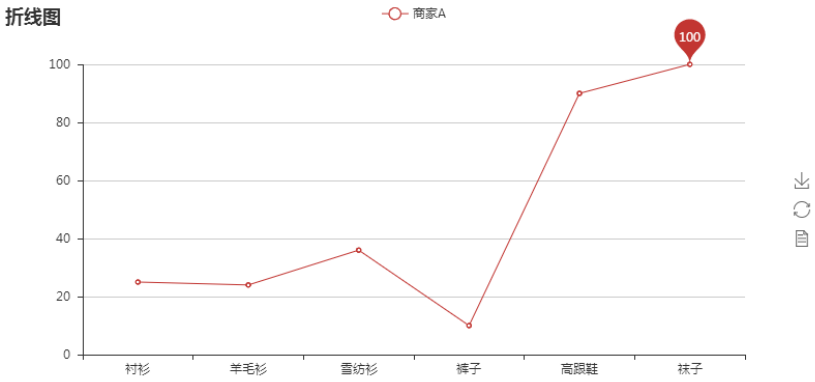
```
from pyecharts import Radar
schema = [("维护", 6500), ("管理", 16000), ("广告投入", 30000), ("客服", 38000),
("人力", 52000), ("研发", 25000)]
radar_data1 = [[4300, 10000, 28000, 35000, 50000, 19000]]
radar_data2 =[[5000, 14000, 28000, 31000, 42000, 21000]]
radar = Radar()
radar.config(schema)
radar.add("预算经费",radar_data1)
```

```
radar.add("实际经费",radar_data2,item_color="#1C86EE")
radar.show_config()
radar.render()
```



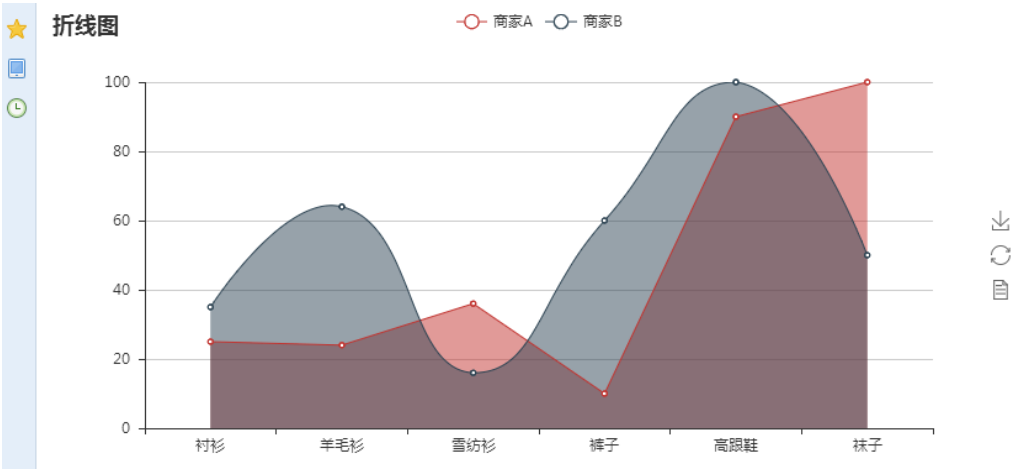
6. 绘制折线图/面积图

```
from pyecharts import Line
attr=["衬衫", "羊毛衫", "雪纺衫", "裤子", "高跟鞋", "袜子"]
v1 =[25, 24, 36, 10, 90, 100]
line =Line("折线图")
line.add("商家 A", attr, v1, mark_point=["max"])

#在折线图中添加内容
# v2 = [35, 64, 16, 60, 100, 50]
# line.add("商家 B", attr, v2, mark_point=["average"])


line.show_config()
line.render()
```



7. 用 pyecharts 库绘制折线图

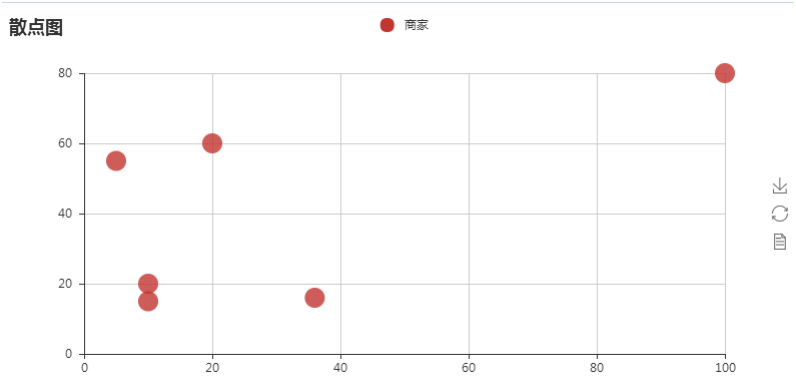
```
from pyecharts import Line

attr = ["衬衫", "羊毛衫", "雪纺衫", "裤子", "高跟鞋", "袜子"]
v1 = [25, 24, 36, 10, 90, 100]
v2 = [35, 64, 16, 60, 100, 50]
line = Line("折线图")
line.add("商家 A", attr, v1, is_fill=True, area_opacity=0.5)
line.add("商家 B", attr, v2, is_fill=True, is_smooth=True, area_opacity=0.5)
line.show_config()
line.render()
```



8. 绘制散点图

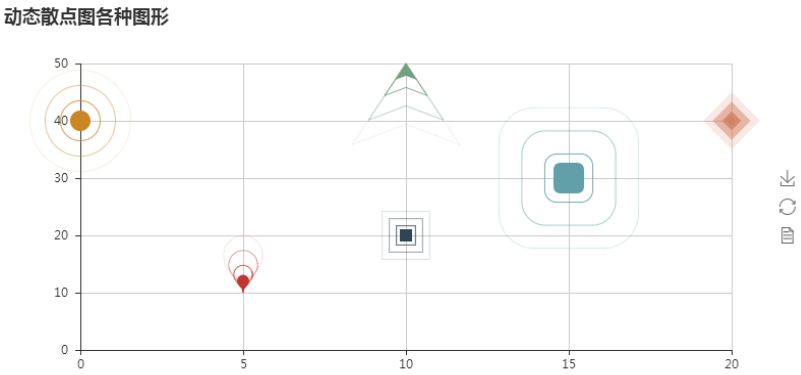
```
from pyecharts import Scatter
```

```
v1 = [5, 20, 36, 10, 10, 100]
v2 = [55, 60, 16, 20, 15, 80]
es = Scatter("散点图")
es.add("商家", v1, v2, symbol_size=20)
es.show_config()
es.render()
```



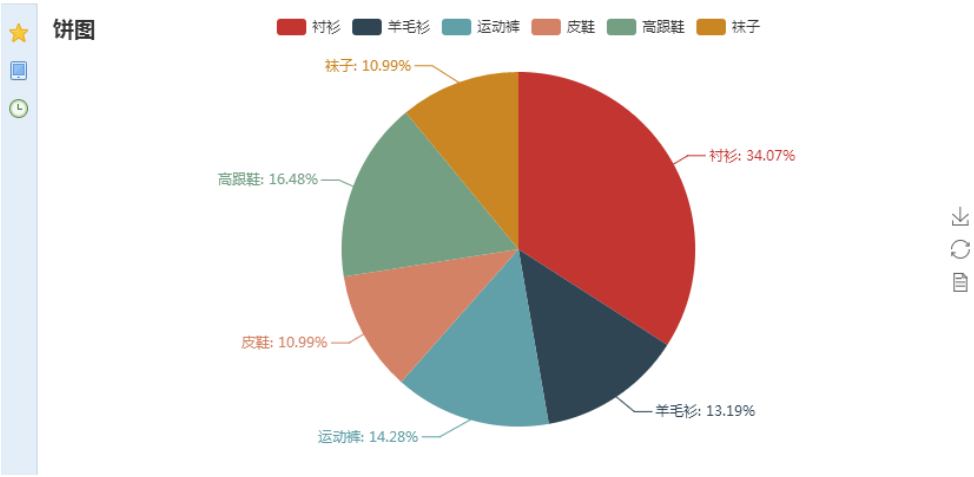
9. 绘制动态散点图

```
from pyecharts import EffectScatter

es = EffectScatter("动态散点图各种图形")
es.add("", [5], [10], symbol_size=20, effect_scale=3.5, symbol="pin")
es.add("", [10], [20], symbol_size=12, effect_scale=4.5, symbol="rect")
es.add("", [15], [30], symbol_size=30, effect_scale=5.5, symbol="roundRect")
es.add("", [20], [40], symbol_size=10, effect_scale=6.5, symbol="diamond")
es.add("", [10], [50], symbol_size=16, effect_scale=5.5, symbol="arrow")
es.add("", [0], [40], symbol_size=20, effect_scale=5.5, symbol="circle")
es.show_config()
es.render()
```



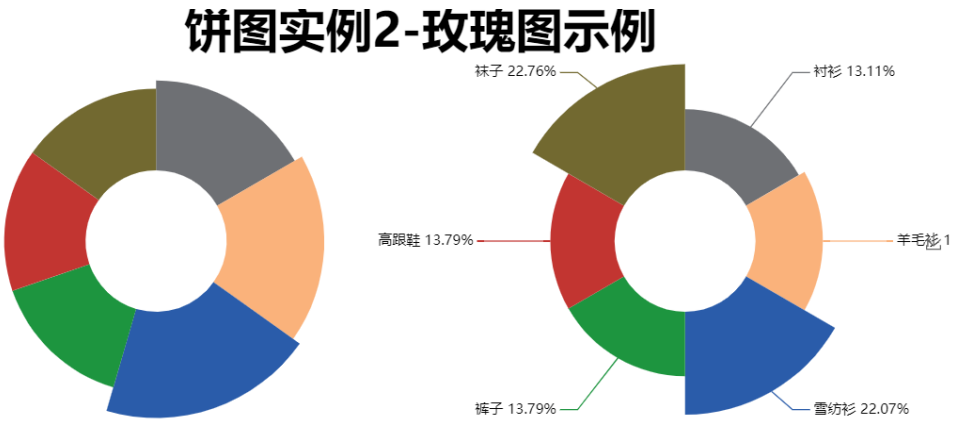
10. 绘制饼图

```
from pyecharts import Pie
attr = ["衬衫", "羊毛衫", "运动裤", "皮鞋", "高跟鞋", "袜子"]
v1 = [31, 12, 13, 10, 15, 10]
pie = Pie("饼图")
pie.add("", attr, v1, is_label_show=True)
pie.render()
```

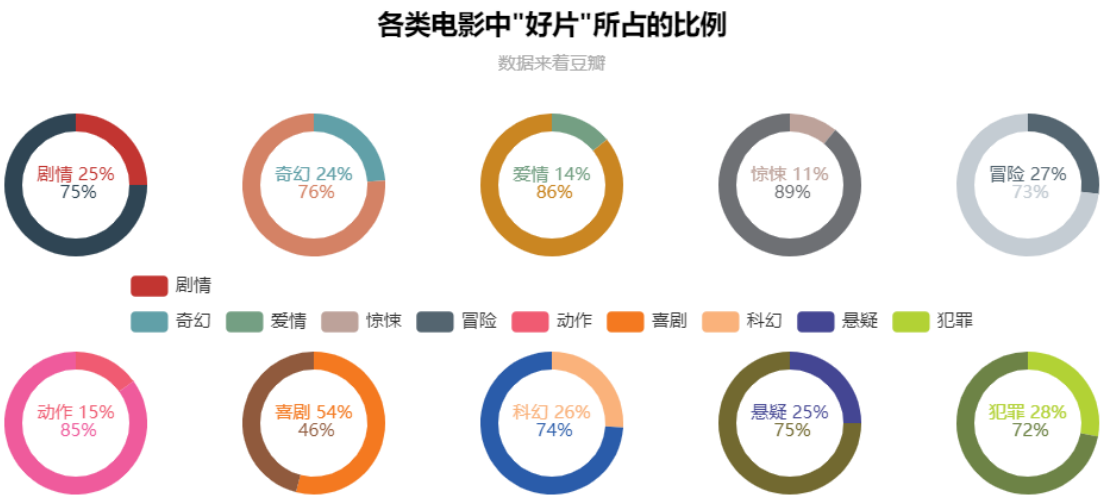



```
from pyecharts import Pie
attr = ["衬衫", "羊毛衫", "雪纺衫", "裤子", "高跟鞋", "袜子"]
v1 = [11, 12, 13, 10, 10, 10]
v2 = [19, 21, 32, 20, 20, 33]
# 标题，title_pos 调整标题位置，title_text_size 调整主标题文字大小
pie = Pie("饼图实例 2-玫瑰图示例", title_pos='center', width=900, title_text_size=40)
pie.add("商品 A", attr, v1, center=[25, 50], is_random=True, radius=[
        30, 75], rosetype='radius')
pie.add("商品 B", attr, v2, center=[75, 50], is_random=True, radius=[
        30, 75], rosetype='area', is_legend_show=False, is_label_show=True)
```

pie.show_config()
pie.render()




```
from pyecharts import Pie
pie = Pie('各类电影中"好片"所占的比例', "数据来着豆瓣", title_pos='center')
pie.add("", ["剧情", ""], [25, 75], center=[10, 30], radius=[18, 24],
        label_pos='center', is_label_show=True, label_text_color=None, )
pie.add("", ["奇幻", ""], [24, 76], center=[30, 30], radius=[18, 24],
        label_pos='center', is_label_show=True, label_text_color=None,
legend_pos='left')
pie.add("", ["爱情", ""], [14, 86], center=[50, 30], radius=[18, 24],
        label_pos='center', is_label_show=True, label_text_color=None)
pie.add("", ["惊悚", ""], [11, 89], center=[70, 30], radius=[18, 24],
        label_pos='center', is_label_show=True, label_text_color=None)
pie.add("", ["冒险", ""], [27, 73], center=[90, 30], radius=[18, 24],
        label_pos='center', is_label_show=True, label_text_color=None)
pie.add("", ["动作", ""], [15, 85], center=[10, 70], radius=[18, 24],
        label_pos='center', is_label_show=True, label_text_color=None)
pie.add("", ["喜剧", ""], [54, 46], center=[30, 70], radius=[18, 24],
        label_pos='center', is_label_show=True, label_text_color=None)
pie.add("", ["科幻", ""], [26, 74], center=[50, 70], radius=[18, 24],
        label_pos='center', is_label_show=True, label_text_color=None)
pie.add("", ["悬疑", ""], [25, 75], center=[70, 70], radius=[18, 24],
        label_pos='center', is_label_show=True, label_text_color=None)
pie.add("", ["犯罪", ""], [28, 72], center=[90, 70], radius=[18, 24],
label_pos='center',
        is_label_show=True, label_text_color=None, is_legend_show=True,
legend_top="center")
pie.show_config()
pie.render()
```



11. 绘制词云

```
from pyecharts import WordCloud
name =['Leslie', 'Lucy', 'Black', 'Clinton', 'Charter Communications', 'Chick Fil A', 'Planet Fitness', 'Pitch Perfect', 'Express', 'Home', 'Johnny Depp', 'Lena Dunham', 'Lewis Hamilton', 'KXAN', 'Mary Ellen Mark', 'Farrah Abraham', 'Rita Ora', 'Serena Williams', 'NCAA baseball  tournament', 'Point Break']
value =[10000, 6181, 4386, 4055, 2467, 2244, 1898, 1484, 1112, 965, 847, 582, 555, 550, 462, 366, 360, 282, 273, 265]
wordcloud =WordCloud(width=1300, height=620)
wordcloud.add("", name, value, word_size_range=[20, 100])
wordcloud.show_config()
wordcloud.render()
```

12. 水球图

```
from pyecharts import Liquid

liquid = Liquid("水球图示例")
liquid.add("Liquid", [0.6, 0.5, 0.4, 0.3], is_liquid_outline_show=False)
liquid.show_config()
liquid.render()
```

13. Map 绘制

```
from pyecharts import Map
```

```
value = [120, 110, 130]
attr = ['河南', '山西', '辽宁']
map = Map('Map 结合 VisualMap 实例', width=800, height=400)
map.add('', attr, value, maptype='china',
        is_visualmap=True, visual_text_color='#000')
map.render()
```