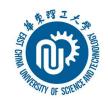


Python与金融数据挖掘(4)

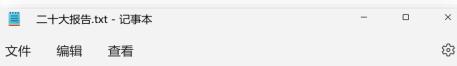
文欣秀

wenxinxiu@ecust.edu.cn



案例分析一





同志们:

现在,我代表第十九届中央委员会向大会作报告。

中国共产党第二十次全国代表大会,是在全党全国各族人民 迈上全面建设社会主义现代化国家新征程、向第二个百年奋 斗目标进军的关键时刻召开的一次十分重要的大会。

大会的主题是: 高举中国特色社会主义伟大旗帜, 全面贯彻新时代中国特色社会主义思想, 弘扬伟大建党精神, 自信自强、守正创新, 踔厉奋发、勇毅前行, 为全面建设社会主义现代化国家、全面推进中华民族伟大复兴而团结奋斗。



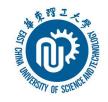
文件读操作

read(): 读取整个文件到字符串中

```
fobj=open("二十大报告.txt", "r", encoding="utf-8")
paper=fobj. read()
print(paper)
fobj. close()
```

问题: 总是忘记关闭文件怎么办?

文件读操作



with语句: 化简代码、处理异常

with open("二十大报告.txt", "r", encoding ='utf-8') as fobj:

paper=fobj. read()

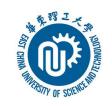
print(paper)



文件写操作

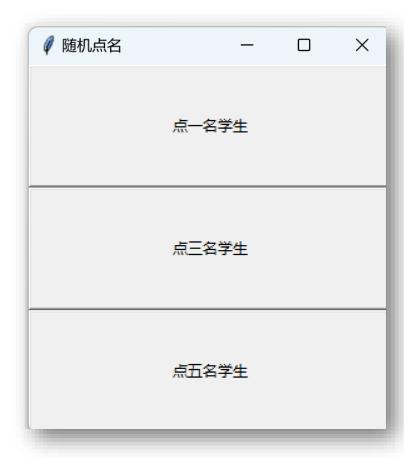
write(): 将一个字符串写入文件中

```
with open("XX财富网简介.txt","r",encoding="utf-8") as fobj:
  paper=fobj.read()
  before=input("被替代字:")
  after=input("替代为字:")
  result=paper.replace(before,after)
with open("result.txt", "w") as f2:
  f2.write(result)
```



案例分析二

	А	В
1	学号	姓名
2	20002518	邹轩敏
3	21012973	李一凡
4	21012974	王绘雯
5	21012975	黄佳妮
6	21012976	李雨杉
7	21012978	胡凯
8	21012979	党嘉懿
9	21012980	马睿
10	21012981	赵骏飞
11	21012982	袁洲力





文件读操作

readlines(): 读取整个文件并创建列表

	Α	В
1	学号	姓名
2	20002518	邹轩敏
3	21012973	李一凡
4	21012974	王绘雯
5	21012975	黄佳妮
6	21012976	李雨杉
7	21012978	胡凯
8	21012979	党嘉懿
9	21012980	马睿
10	21012981	赵骏飞
11	21012982	袁洲力

```
fobj= open("student.csv", 'r')
aList=fobj. readlines()
print (aList)
for i in aList:
    print(i. strip())
fobj. close()
```



文件读操作

化简方法: 直接在文件对象上循环读取内容

with open("student.csv", 'r') as fobj:

for i in fobj:

i=i. strip()

code, name=i. split(",")

print(name)



文件写操作

writelines():字符串列表按行写入文件

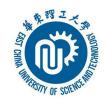
```
aList=[]
with open("name.csv", 'r', encoding="utf-8") as f1:
  for line in f1:
     line=line. strip()
     new=line[0]+len(line[1:])*"*"
     aList. append(new + "\n")
with open("新名字.csv", 'w', encoding="utf-8") as f2:
  f2. writelines(aList)
```



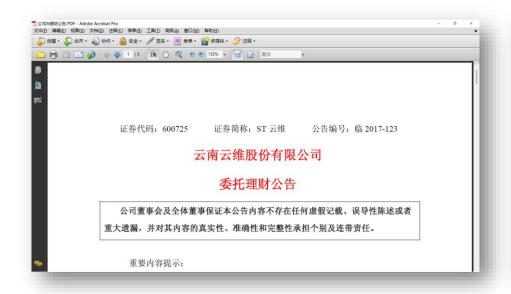
案例分析



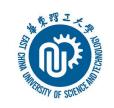




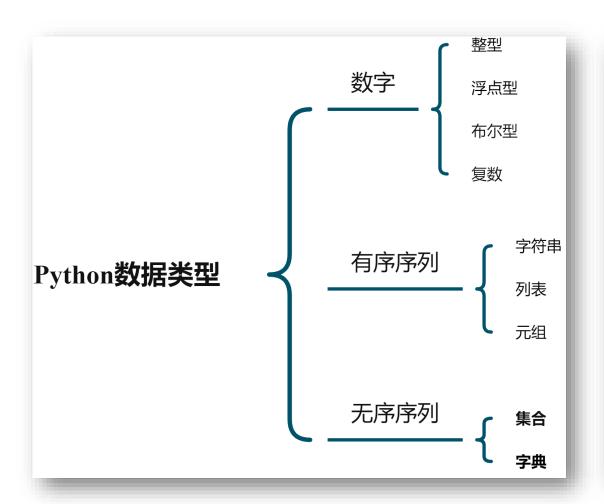
案例分析



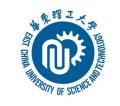




数据类型



代码	名称	
000001	上证指数	
399001	深证成指	
899050	北证50	
000300	沪深300	
399005	中小100	
399006	创业板指	



常用字典方法

di.keys(): 返回包含字典所有健的列表

di.values(): 返回包含字典所有值的列表

di.items(): 返回包含所有(键、值)项列表

di.get(key,[default]): 返回健key对应的值, 若

key不存在,则返回default

di.update(a): 将字典a中的键值对添加到di中



课堂练习

若dic={"000001":"上证指数","899050":"北证50"},

则执行 dic.get('000300')的结果是()

A、"北证50"

B, False

C、报错

D、空值





matplotlib: 用于绘图的第三方库

wordcloud: 用于词云展示的第三方库

imageio: 读取和写入各种图像的第三方库

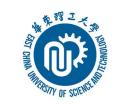




	А	В	
1	学号	姓名	
2	20002518	邹轩敏	
3	21012973	李一凡	
4	21012974	王绘雯	
5	21012975	黄佳妮	
6	21012976	李雨杉	
7	21012978	胡凯	
8	21012979	党嘉懿	
9	21012980	马睿	
10	21012981	赵骏飞	
11	21012982	袁洲力	
Attacks III			



```
from random import *
counts={}#创建一个空字典
with open("student.csv", 'r') as fobj:
  for i in fobj:
     if i[:2]=="学号":
        continue
      i=i. strip()
      code, name=i. split(",")
      counts[name]=randint(30,100)
import matplotlib. pyplot as plt
from wordcloud import WordCloud
from imageio.v2 import imread
```



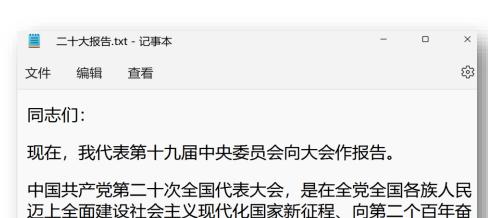
爱心词云

```
pic = imread('love.png')
wc=WordCloud(mask=pic,font_path='msyh.ttc', #中文字体
     repeat=False, #内容是否可以重复
      background_color='white',#设置背景颜色
     max_words=100, #设置最大词数
     max_font_size=120, #设置字体最大值
     min font size=10, #设置字体最小值
                     #设置有配色方案
     random_state=50,
                      #按照比例进行放大画布
      scale=1)
wc.generate_from_frequencies(Counts)
plt.imshow(wc)
plt.show()
```

Т



如何实现分词?



大会的主题是: 高举中国特色社会主义伟大旗帜, 全面贯彻新时代中国特色社会主义思想, 弘扬伟大建党精神, 自信自强、守正创新, 踔厉奋发、勇毅前行, 为全面建设社会主义现代化国家、全面推进中华民族伟大复兴而团结奋斗。

斗目标进军的关键时刻召开的一次十分重要的大会。



关于文本词频统计



词频统计的内涵: 累加问题,即对文档中的每个词设计一个计数器,词语出现一次,计算器加1,词和次数是一对出现,构成

<单词>: <出现次数>

键值对: 字典

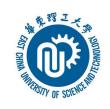






从文件中读取一 篇待分析的文章 采用字典数据结构 统计词语出现的频率 根据词频进行图形绘制或统计高频词语





- ◆提供中文词库 pip install jieba
- ◆ 将待分词的内容与分词词库进行比对
- ◆ 通过图结构和动态规划方法找到最大概率词组
- ◆ 增加自定义中文单词的功能



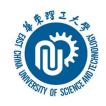


精确模式:将句子最精确地切开,适合文本分析

>>>import jieba

>>>jieba. lcut("中华人民共和国是一个伟大的国家")





全模式: 把句子中所有可以成词的词语都扫描出来, 速度非常快, 但不能消除歧义

>>>import jieba

>>>jieba. lcut ("中华人民共和国是一个伟大的国家",cut_all=True)





搜索引擎模式: 在精确模式基础上, 对长词再次切分,

提高召回率,适合用于搜索引擎分词

>>>import jieba

>>>jieba. lcut_for_search("中华人民共和国是一个伟大的国家")





- >>>import jieba
- >>>jieba.lcut("习大大希望中国的老百姓有更好的生活")
- >>>jieba.add_word("习大大")
- >>>jieba.lcut("习大大希望中国的老百姓有更好的生活")



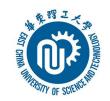


```
import jieba
import matplotlib.pyplot as plt
from wordcloud import WordCloud
from imageio.v2 import imread
fobj=open("二十大报告.txt","r",encoding="utf-8")
txt=fobj. read()
words=jieba. lcut(txt)
```





```
aList=["上海","北京","上海","云南","北京","上海"]
counts={}
for word in aList:
  if word not in counts:
    counts[word]=1
  else:
    counts[word]=counts[word]+1
print(counts)
```



单词计数方法二

```
aList=["上海","北京","上海","云南","北京","上海"]
```

```
counts={ }
```

for word in aList:

counts[word]=counts. get(word,0)+1

print(counts)

二十大报告词云案例 (2)



```
counts={}
for word in words:
    if len(word)==1:
       continue
    else:
       counts[word]=counts. get(word,0)+1
pic = imread('cloud.jpg')
```

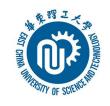
二十大报告词云案例(3)



```
wc=WordCloud(mask=pic,font_path='msyh.ttc', #中文字体 repeat=False, #内容可以重复 background_color='white', #设置背景颜色 max_words=110, #设置最大词数 max_font_size=120, #设置字体最大值 min_font_size=10, #设置字体最小值 random_state=50, #设置配色方案 scale=10)
```

wc.generate_from_frequencies(**COUNTS**)
plt.imshow(wc) #将数值以图片形式显示出来
plt.show()

二十大报告词云案例





问题:如何去掉部分不重要的词语?



集合定义

- ◆集合使用大括号 {} 来包裹
- ◆集合相当于**只有键没有值**的字典
- ◆集合内的元素**不可重复**出现
- ◆集合内的元素是**不可变**的
- ◆集合内的元素**没有**先后关系

集合运算一示例



```
>>> a={"江西铜业","神州长城","中集集团","古井贡酒"}
>>> h={"中集集团","江西铜业","小米集团","阿里影业"}
             {'中集集团', '江西铜业'}
>>> a & h
>>> a | h {'中集集团','古井贡酒','小米集团','阿里影业','神州长城','江西铜业'}
              {'神州长城','古井贡酒'}
>>> a - h
>>> a ^ h {'小米集团', '阿里影业', '神州长城', '古井贡酒'}
>>> "小米集团" not in a True
```

集合运算二示例



>>> a={"江西铜业","神州长城","中集集团","古井贡酒"}

>>> h={"中集集团","江西铜业","小米集团","阿里影业"}

>>> s={"江西铜业","中集集团"}

>>> s<=a

True

>>> s > h

False

>>> s< a

True

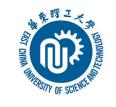
>>> a==h

False

二十大报告词云案例(修改2)



```
counts={}
excludes={"不断","一系列","基本"}
for word in words:
    if len(word)==1:
      continue
    elif word in excludes:
      continue
    else:
      counts[word]=counts.get(word,0)+1
```



拓展问题



思考: 如何从文件中读取所有停用词并进行判断?

从文件获取排除词



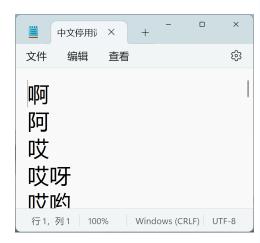
excludes=set()

with open("中文停用词.txt", "r") as handle:

for i in handle:

i=i. strip()

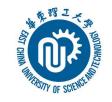
excludes. add(i)



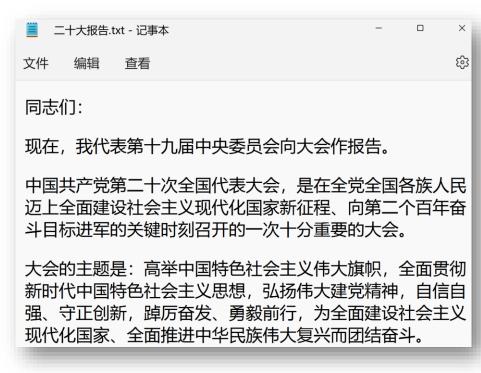
二十大报告词云案例(修改3)

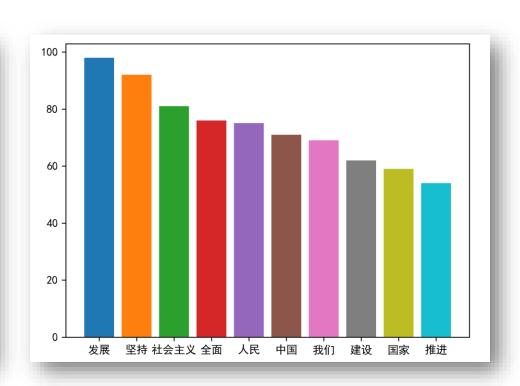


```
counts={ }
excludes=set()
with open("中文停用词.txt","r",encoding="utf-8") as fobj:
    for i in fobj:
       i=i. strip()
       excludes. add(i)
for word in words:
    if len(word)==1:
       continue
    elif word in excludes:
       continue
    else:
       counts[word]=counts. get(word,0)+1
```



拓展问题





问题: 如何根据词频画出柱状图?



二十大报告词频统计案例

import jieba

import matplotlib.pyplot as plt

from wordcloud import WordCloud

from imageio.v2 import imread

fobj=open("二十大报告.txt","r",encoding="utf-8")

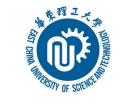
txt=fobj.read()

words=jieba.lcut(txt)



二十大报告词频统计案例

```
counts={ }
excludes=set()
with open("中文停用词.txt","r",encoding="utf-8") as fobj:
    for i in fobj:
       i=i. strip()
       excludes. add(i)
for word in words:
    if len(word)==1:
       continue
    elif word in excludes:
       continue
    else:
       counts[word]=counts. get(word,0)+1
```

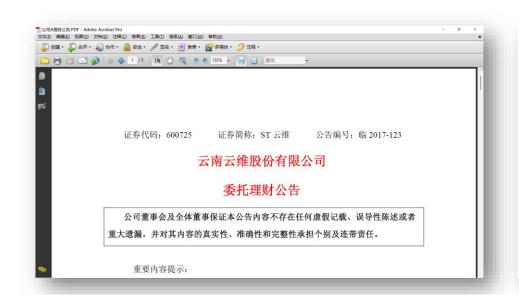


二十大报告词频统计案例

```
items=list(counts.items())
items. sort(key=lambda x:x[1],reverse=True)
plt.rcParams['font.sans-serif']=['SimHei']
                                        #用来正常显示中文标签
for i in range(10):
  word,count=items[i]
  plt.bar(word,count)
plt.show()
```



拓展问题





思考:如何从pdf文件中读取数据进行词频统计?



PDF文件读取

import pdfplumber

```
pdf = pdfplumber.open('公司A理财公告.PDF')
pages = pdf. pages
text_all = []
for page in pages:
                       #遍历pages中每一页的信息
                       #提取当页的文本内容
 text = page. extract_text()
                       #汇总每一页内容
 text_all. append(text)
text_all = ". join(text_all)
                       #把列表转换成字符串
print(text_all)
                       #打印全部文本内容
pdf. close()
```



生成词典

```
import jieba
import matplotlib.pyplot as plt
from wordcloud import WordCloud
from imageio.v2 import imread
words=jieba.lcut(text_all)
counts={}
for word in words:
    if len(word)==1:
       continue
     else:
       counts[word]=counts. get(word,0)+1
pic = imread('cloud.jpg')
```



绘制词云

```
wc=WordCloud(mask=pic,font_path='msyh.ttc', #中文字体
     repeat=False, #内容可以重复
     background_color='white',#设置背景颜色
     max_words=110, #设置最大词数
     max font size=120, #设置字体最大值
     min font size=10, #设置字体最小值
     random_state=50, #设置配色方案
     scale=10)
wc.generate_from_frequencies(counts)
plt.imshow(wc) #将数值以图片形式显示出来
plt.show()
```



思考

Al in Finance: Challenges, Techniques, and Opportunities

LONGBING CAO, University of Technology Sydney, Australia

AI in finance refers to the applications of AI techniques in financial businesses. This area has attracted attention for decades, with both classic and modern AI techniques applied to increasingly broader areas of finance, economy, and society. In contrast to reviews on discussing the problems, aspects, and opportunities of finance benefited from specific or some new-generation AI and data science (AIDS) techniques or the progress of applying specific techniques to resolving certain financial problems, this review offers a comprehensive and dense landscape of the overwhelming challenges, techniques, and opportunities of AIDS research in finance over the past decades. The challenges of financial businesses and data are first outlined, followed by a comprehensive categorization and a dense overview of the decades of AIDS research in finance. We then structure and illustrate the data-driven analytics and learning of financial businesses and data. A comparison, criticism, and discussion of classic versus modern AIDS techniques for finance follows. Finally, the open issues and opportunities to address future AIDS-empowered finance and finance-motivated AIDS research are discussed.





谢谢