
python
import turtle
turtle.setup(650,350,200,200)
turtle.penup()
turtle.fd(-250)
turtle.pendown()
turtle.pensize(25)
turtle.pencolor("purple")
turtle.seth(-40)
for 1 in range(4):
turtle.circle(40, 80)
turtle.circle(-40, 80)
turtle.circle(40, 80/2)
turtle.fd(40)
turtle.circle(16, 180)
turtle.fd(40 * 2/3)

Python语言程序设计

实例10: 文本词频统计

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"文本词频统计"问题分析

问题分析

文本词频统计

- 需求：一篇文章，出现了哪些词？哪些词出现得最多？
- 该怎么做呢？

英文文本 ⇨ 中文文本

问题分析

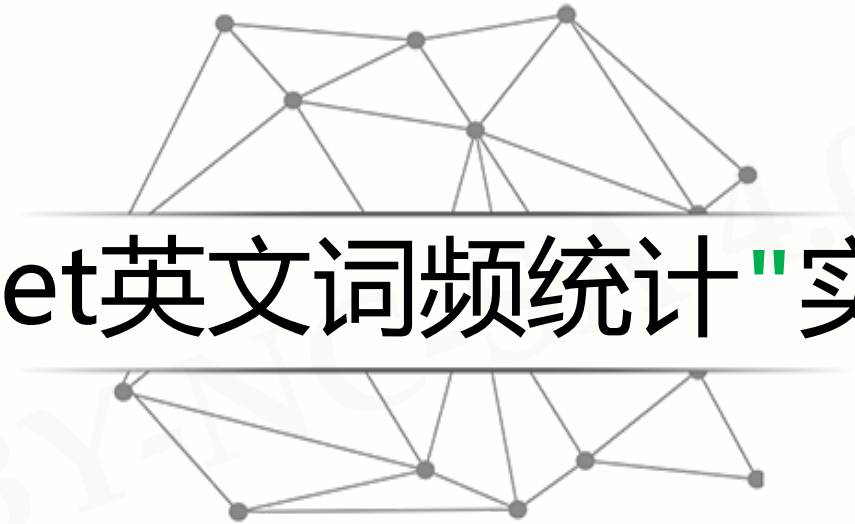
文本词频统计

- **英文文本：*Hamet*　　分析词频**

https://python123.io/resources/pye/hamlet.txt

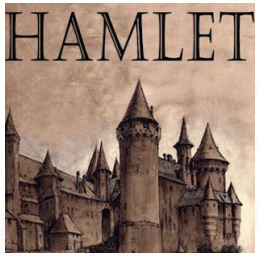
- **中文文本：《三国演义》 分析人物**

https://python123.io/resources/pye/threekingdoms.txt



"Hamlet英文词频统计"实例讲解

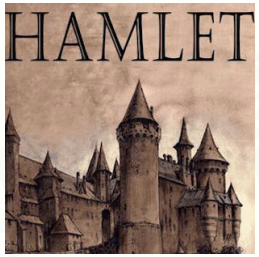
```
#CalHamletV1.py
def getText():
    txt = open("hamlet.txt", "r").read()
    txt = txt.lower()
    for ch in '!"#$%&()*+,-./:;<=>?@[\\]^_‘{|}~':
        txt = txt.replace(ch, " ")
    return txt

hamletTxt = getText()
words  = hamletTxt.split()
counts = {}
for word in words:
    counts[word] = counts.get(word,0) + 1
items = list(counts.items())
items.sort(key=lambda x:x[1], reverse=True)
for i in range(10):
    word, count = items[i]
    print("{0:<10}{1:>5}".format(word, count))
```



- 文本去噪及归一化
- 使用字典表达词频

python

```
>>>
the          1138
and           965
to            754
of            669
you           550
i             542
a             542
my            514
hamlet        462
in            436
```



- 运行结果由大到小排序
- 观察单词出现次数

准备好电脑，与老师一起编码吧！

"《三国演义》人物出场统计"实例讲解(上)

```
#CalThreeKingdomsV1.py
import jieba
txt = open("threekingdoms.txt", "r", encoding="utf-8").read()
words = jieba.lcut(txt)
counts = {}
for word in words:
    if len(word) == 1:
        continue
    else:
        counts[word] = counts.get(word,0) + 1
items = list(counts.items())
items.sort(key=lambda x:x[1], reverse=True)
for i in range(15):
    word, count = items[i]
    print("{0:<10}{1:>5}".format(word, count))
```

- 中文文本分词
- 使用字典表达词频

python

```
>>>
曹操      953
孔明      836
将军      772
却说      656
玄德      585
关公      510
丞相      491
二人      469
不可      440
荆州      425
玄德曰     390
孔明曰     390
不能      384
如此      378
张飞      358
```

- 中文文本分词
- 使用字典表达词频

准备好电脑，与老师一起编码吧！

"《三国演义》人物出场统计"实例讲解(下)

《三国演义》人物出场统计

将词频与人物相关联，面向问题

词频统计 ⇨ **人物统计**

```
#CalThreeKingdomsV2.py
import jieba
txt = open("threekingdoms.txt", "r", encoding="utf-8").read()
excludes = {"将军","却说","荆州","二人","不可","不能","如此"}
words = jieba.lcut(txt)
counts = {}
for word in words:
    if len(word) == 1:
        continue
    elif word == "诸葛亮" or word == "孔明曰":
        rword = "孔明"
    elif word == "关公" or word == "云长":
        rword = "关羽"
    elif word == "玄德" or word == "玄德曰":
        rword = "刘备"
    elif word == "孟德" or word == "丞相":
        rword = "曹操"
    else:
        rword = word
    counts[rword] = counts.get(rword,0) + 1
for word in excludes:
    del counts[word]
items = list(counts.items())
items.sort(key=lambda x:x[1], reverse=True)
for i in range(10):
    word, count = items[i]
    print("{0:<10}{1:>5}".format(word, count))
```

- 中文文本分词
- 使用字典表达词频
- 扩展程序解决问题

原创 @嵩天老师团队

python

```
>>>
曹操        1451
孔明        1383
刘备        1252
关羽         784
张飞         358
商议         344
如何         338
主公         331
军士         317
吕布         300
```

- 根据结果进一步优化

隆重发布《三国演义》人物出场顺序前20：

曹操、孔明、刘备、关羽、张飞、吕布、赵云、孙权、司马懿、周瑜、袁绍、马超、魏延、黄忠、姜维、马岱、庞德、孟获、刘表、夏侯惇

准备好电脑，与老师一起编码吧！

"文本词频统计"举一反三

```
#CalThreeKingdomsV2.py
import jieba
txt = open("threekingdoms.txt", "r", encoding="utf-8").read()
excludes = {"将军","却说","荆州","二人","不可","不能","如此"}
words = jieba.lcut(txt)
counts = {}
for word in words:
    if len(word) == 1:
        continue
    elif word == "诸葛亮" or word == "孔明曰":
        rword = "孔明"
    elif word == "关公" or word == "云长":
        rword = "关羽"
    elif word == "玄德" or word == "玄德曰":
        rword = "刘备"
    elif word == "孟德" or word == "丞相":
        rword = "曹操"
    else:
        rword = word
    counts[rword] = counts.get(rword,0) + 1
for word in excludes:
    del counts[word]
items = list(counts.items())
items.sort(key=lambda x:x[1], reverse=True)
for i in range(10):
    word, count = items[i]
    print("{0:<10}{1:>5}".format(word, count))
```

- 中文文本分词
- 使用字典表达词频
- 扩展程序解决问题

原创 @嵩天老师团队

python

举一反三

应用问题的扩展

- 《红楼梦》、《西游记》、《水浒传》...
- 政府工作报告、科研论文、新闻报道 ...
- 进一步呢？ 未来还有词云...

小花絮

全国计算机等级考试二级 Python科目

http://ncre.neea.edu.cn

全国计算机等级考试（简称NCRE）是教育部批准，由教育部考试中心主办，面向社会，用于考查应试人员计算机应用知识与技能的全国性计算机水平考试体系。

二级Python语言科目在 2018年9月 首考，异常火爆，快去报名试试吧！