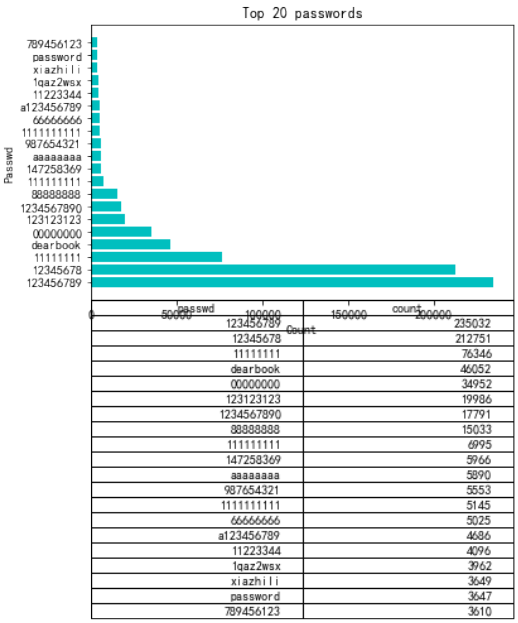
```
#数据库查询操作
import pymysql
import numpy as np
import matplotlib.pyplot as plt
connect=pymysql.Connection(
    host='localhost',
    port=3306,
    user='root',
    passwd='TianMao@19940818',
    db='websecurity'
)
cursor=connect.cursor()


#常用的密码排名（前20名），画出表格
sql1="SELECT passwd, count(*) AS count FROM csdn GROUP BY passwd  ORDER BY count DESC  LIMIT 20"
cursor.execute(sql1)
result1=cursor.fetchall()
dtype1=np.dtype([('passwd','S20'),('count',np.int)])
data1=np.fromiter(result1,dtype=dtype1)

#python中将bytes串转换为str，使用decode解码即可
passwd_data=list(temp.decode('ascii') for temp in data1['passwd'])
count_data=list(data1['count'])
mean_count=np.mean(count_data)


import matplotlib.pyplot as plt

plt.barh(range(20),count_data,color='c',tick_label=passwd_data,label=count_data)
plt.xlabel("Count")
plt.ylabel("Passwd")
plt.title("Top 20 passwords")
data=[[passwd_data[i],count_data[i]] for i in range(20)]
table_head=["passwd","count"]
plt.table(cellText=data,colLabels=table_head,colWidths=[0.5]*2)
plt.savefig("pictures/1_col.png")
plt.show()
#xiazhili同学出现3649次
```



passwd	count
123456789	235032
12345678	212751
11111111	76346
dearbook	46052
00000000	34952
123123123	19986
1234567890	17791
88888888	15033
111111111	6995
147258369	5966
aaaaaaaa	5890
987654321	5553
1111111111	5145
66666666	5025
a123456789	4686
11223344	4096
1qaz2wsx	3962
xiazhili	3649
password	3647
789456123	3610

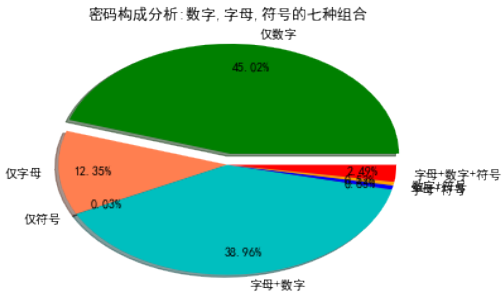
```
#密码构成元素分析（数字、字符、字母等）和结构分析
#全为数字
sql_2=[]#保存所有的sql语句
sql2_1="SELECT count(id) AS count FROM csdn where passwd regexp '^[0-9]+$'"
sql_2.append(sql2_1)
# cursor.execute(sql2_1)
# result=cursor.fetchall()
```

```
# print(result)
#全为字母
sql2_2="SELECT count(id) AS count FROM csdn where passwd regexp'^[A-Za-z]+$'"
sql_2.append(sql2_2)
#全为符号
sql2_3="SELECT count(id) AS count FROM csdn where passwd regexp'^[^A-Za-z0-9]+$'"
sql_2.append(sql2_3)
#字母数字的结合
sql2_4="SELECT count(id) AS count FROM csdn where passwd  not regexp '[^0-9a-zA-Z]' and passwd regexp '[a-zA-Z]' and pas
sql_2.append(sql2_4)
#字母符号的结合
sql2_5="SELECT count(id) AS count FROM csdn where passwd  not regexp '[a-zA-Z]' and passwd regexp '[^A-Za-z0-9]' and pas
sql_2.append(sql2_5)
#数字符号的结合
sql2_6="SELECT count(id) AS count FROM csdn where passwd  not regexp '[0-9]' and passwd regexp '[^A-Za-z0-9]' and passwd
sql_2.append(sql2_6)
#字母数字符号结合
sql2_7="SELECT count(id) AS count FROM csdn where passwd  regexp '[0-9]' and passwd regexp '[^A-Za-z0-9]' and passwd reg
sql_2.append(sql2_7)

#换出饼状图

result2=[]#保存所有的结果
print("query start")
for i in range(7):
    cursor.execute(sql_2[i])
    result2.append(cursor.fetchall())
    print(i+1)
print("query over!")
```

```
query start
1
2
3
4
5
6
7
query over!
```

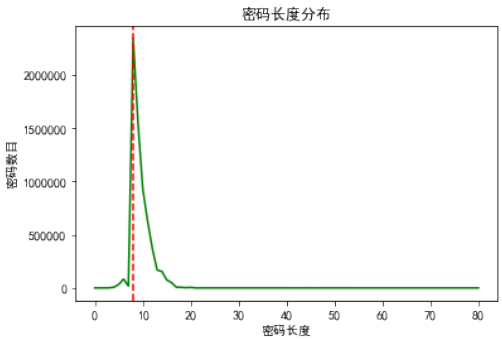
```
from functools import reduce
import matplotlib
#matplotlib中中文显示
matplotlib.rcParams['font.sans-serif']=['SimHei']
matplotlib.rcParams['font.family']='sans-serif'
#取出最终结果，放入list中
outcome2=[ result2[i][0][0] for i in range(7)]
print("outcome2:",outcome2)
#使用reduce累加，验证结果正确与否，总共6428631条
def add(x,y):
    return x+y
print("total:",reduce(add,outcome2))
#绘制pie状图
labels_2=[u"仅数字",u"仅字母",u"仅符号",u"字母+数字",u"字母+符号",u"数字+符号",u"字母+数字+符号"]


colors = ["green","coral","red","c","blue","orange","red"]
expl=[0.1,0,0,0,0.0,0,0]
plt.pie(outcome2,explode=expl,labels=labels_2,colors=colors,autopct='%1.2f%%',pctdistance=0.8, shadow=True)
plt.title(u"密码构成分析:数字,字母,符号的七种组合")
plt.savefig("pictures/2_pie.png")
plt.show()
```

```
outcome2: [2893861, 794126, 1820, 2504685, 40386, 33742, 160011]
total: 6428631
```




```
#密码长度的概率分布，画出折线图
#密码的长度[1,2,3,4...max]，首先使用sql查询最长密码的长度
sql3_1="SELECT length(passwd) AS length,count(*) AS count FROM csdn GROUP BY length(passwd) ORDER BY length ASC"
cursor.execute(sql3_1)
result3=cursor.fetchall()
dtype3=np.dtype([('length',np.int),('count',np.int)])
data3=np.fromiter(result3,dtype=dtype3)

length_3=list(data3['length'])
count_3=list(data3['count'])


print("length:",length_3)
print("count:",count_3)
#验证密码总条数正确与否
print("total:",reduce(add,count_3))
#绘制折线图
plt.plot(length_3,count_3,color='g')
plt.title(u"密码长度分布")
plt.xlabel(u"密码长度")
plt.ylabel(u"密码数目")
#频率最高的密码长度是8位密码
plt.axvline(8,color='r',ls='--')
#密码长度的加权平均长度
mean_len=np.average(length_3,weights=count_3)
print("mean_len:",mean_len)
plt.savefig("pictures/3_1_line.png")
plt.show()
```

```
length: [0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 3
count: [1, 163, 108, 712, 6899, 33235, 83412, 17694, 2338109, 1551737, 930472, 628610, 369295, 167690, 154886, 75265, 49
total: 6428632
mean_len: 9.45767933209
```




```
#组合方法


#密码设置成为生日的统计（在sql中使用正则表达式）


#没有重复的密码
sql="SELECT passwd, count(*) AS count FROM csdn GROUP BY passwd  ORDER BY count DESC  LIMIT 20"
```

#拼音，英语单词的使用（键盘格式）

#注册邮箱的使用

#注册邮箱是学校的统计

#机器学习算法对口令的安全性进行分析和评估