

1 代码

1.1 week13_homework_manager.py

```
1  import sys
2  import os
3  import re
4  import time
5  from threading import Thread
6  from socket import *
7
8  BUFFERS=1024
9
10 class Manager:
11     def __init__(self, ip, port, maxconnections = 5):
12         self._ip = ip
13         self._port = port
14         self._maxconnections = maxconnections
15         self._server = socket(AF_INET, SOCK_STREAM) # AF_INET指IPv4协议, SOCK_STREAM指面向流的TCP协议
16
17     def start(self):
18         self._server.setsockopt(SOL_SOCKET, SO_REUSEADDR, 1) # 端口释放后马上可以被重新使用
19         self._server.bind((ip, self._port))
20         self._server.listen(self._maxconnections)
21         self.chatters = {}
22         self.log = []
23         print(f'Chat Romm has started on ip:{self._ip}, port:{self._port}')
24         Thread(target = self.save).start() # 启动save进程监控终端输入
25         while True:
26             conn, addr = self._server.accept()
27             name = conn.recv(BUFFERS).decode("utf-8") # 接收的第一个值是name
28             self.chatters[name] = conn
29             t = Thread(target=self.join_chat, args=(conn, name))
30             t.start()
31         self._server.close()
32
33     def join_chat(self, conn, name):
34         chatter_exit = False
35         msg = f'---欢迎{name}进入聊天室---'
36         msg = self._msg_print(msg)
37         self._msg_broadcast(msg)
38         while True:
39             msg = conn.recv(BUFFERS).decode('utf-8')
40             if not msg:
41                 break
42             elif msg == 'exit':
43                 msg = f'---{name}离开了聊天室---'
44                 chatter_exit = True
45             else:
46                 msg = f'{name}: {msg}'
47             msg = self._msg_print(msg)
48             # @某人
49             at_name = re.search('@+.* ', msg)
50             if at_name: # 若at_name不为NoneType
51                 at_name = at_name.group()[1:-1]
52                 if at_name in list(self.chatters.keys()):
53                     self.chatters[at_name].send(msg.encode("utf-8"))
54             else: # 广播
55                 self._msg_broadcast(msg)
56             if chatter_exit:
57                 del self.chatters[name] # 删除前, 上面的for循环仍发送信息以结束Chatter的receive线程
58                 break
59             conn.close()
```

```
61     def save(self, file_path = 'log.txt'):
62         while True:
63             if input() == 'save':
64                 with open(file_path, 'w', encoding = 'utf-8') as f:
65                     f.write('\n'.join(self.log))
66                     print(f'聊天记录已导出至{file_path}')
67             else:
68                 print('指令错误。如要保存聊天记录, 请输入save。')
69
70     def _msg_print(self, msg): # 包装并打印消息
71         current_time = time.strftime('%Y-%m-%d %H:%M:%S', time.localtime())
72         msg = current_time + ' ' + msg
73         print(msg)
74         self.log.append(msg)
75         return msg
76
77     def _msg_broadcast(self, msg):
78         for chatter in self.chatters.values():
79             chatter.send(msg.encode("utf-8"))
80
81
82 if __name__ == '__main__':
83     host = '127.0.0.1'
84     ip = '192.168.103.68'
85     port = 9999
86     manager = Manager(ip, port)
87     manager.start()
```

1.2 week13_homework_chatter.py

```
1  import sys
2  import os
3  import re
4  from threading import Thread
5  from socket import *
6
7  BUFFERS=1024
8
9
10
11 class Chatter:
12     def __init__(self, ip, port):
13         self._ip = ip
14         self._port = port
15         self._client = socket(AF_INET, SOCK_STREAM) # AF_INET指IPv4协议，SOCK_STREAM指面向流的TCP协
16
17     def start(self, name):
18         self._client.connect((self._ip, self._port))
19         self._client.send(name.encode('utf-8'))
20         self.name = name
21         self.log = []
22         self.t_se = Thread(target=self.send)
23         self.t_se.start()
24         t_re = Thread(target=self.receive)
25         t_re.start()
26
27     def send(self):
28         while True:
29             msg_se = input() # 'Input: '比接收消息打印在终端更快
30             self._client.send(msg_se.encode('utf-8'))
31             if msg_se == 'exit':
32                 self.save()
33                 break
34
35     def receive(self):
36         while True:
37             msg_re = self._client.recv(BUFFERS).decode('utf-8')
38             #print('///received!') # 不知道为什么exit时这个语句会输出很多次，也就是说收到多次空消息？
39             if not self.t_se.is_alive(): # Manager仍发送信息以使线程运行到这一步
40                 self._client.close()
41                 break
42             if not msg_re:
43                 continue
44             else:
45                 print(msg_re) # .decode('utf-8')位置放到if not前
46                 self.log.append(msg_re)
47
48     def save(self):
49         file_path = self.name + '_log.txt'
50         with open(file_path, 'w', encoding = 'utf-8') as f:
51             f.write('\n'.join(self.log))
52         print(f'聊天记录已导出至{file_path}')
53
54
55 if __name__ == '__main__':
56     host = '127.0.0.1'
57     ip = '192.168.103.68'
58     port = 9999
59     chatter = Chatter(ip, port)
60     chatter.start(sys.argv[1])
61
```

2 多台电脑通信测试结果

```
C:\Windows\System32\cmd.exe - python week13_homework_manager.py
E:\北航\课业\大三上\现代程序设计技术\week13>python week13_homework_manager.py
Chat Romm has started on ip:192.168.103.68, port:9999
2022-12-02 18:19:42 ---欢迎QAQ进入聊天室---
2022-12-02 18:20:11 ---欢迎特朗普进入聊天室---
2022-12-02 18:20:16 特朗普: nihao
2022-12-02 18:20:21 QAQ: 好!
2022-12-02 18:20:31 特朗普: make America great again!
2022-12-02 18:21:01 ---欢迎蔡徐坤进入聊天室---
2022-12-02 18:21:17 特朗普: memememememe
2022-12-02 18:21:32 蔡徐坤: 大家好! 我是新
2022-12-02 18:21:57 蔡徐坤: 大家好! 我是新来的实习生蔡徐坤
2022-12-02 18:22:09 蔡徐坤: 我会唱跳rap打篮球
2022-12-02 18:22:11 特朗普: sdavhjadukbausbxayshuxcvsehakjfhgdguagotuywegsdufwau7igxcgsagdcuia
2022-12-02 18:22:14 QAQ: 6
2022-12-02 18:22:19 ---特朗普离开了聊天室---
2022-12-02 18:22:33 ---QAQ离开了聊天室---
2022-12-02 18:23:00 蔡徐坤: byebye
2022-12-02 18:25:00 蔡徐坤: 不是只有住在白宫的才叫总统
2022-12-02 18:25:03 ---蔡徐坤离开了聊天室---
save
聊天记录已导出至log.txt
```

```
log.txt - 记事本
文件(F) 编辑(E) 格式(O) 查看(V) 帮助(H)
2022-12-02 18:19:42 ---欢迎QAQ进入聊天室---
2022-12-02 18:20:11 ---欢迎特朗普进入聊天室---
2022-12-02 18:20:16 特朗普: nihao
2022-12-02 18:20:21 QAQ: 好!
2022-12-02 18:20:31 特朗普: make America great again!
2022-12-02 18:21:01 ---欢迎蔡徐坤进入聊天室---
2022-12-02 18:21:17 特朗普: memememememe
2022-12-02 18:21:32 蔡徐坤: 大家好! 我是新
2022-12-02 18:21:57 蔡徐坤: 大家好! 我是新来的实习生蔡徐坤
2022-12-02 18:22:09 蔡徐坤: 我会唱跳rap打篮球
2022-12-02 18:22:11 特朗普: sdavhjadukbausbxayshuxcvsehakjfhgdguagotuywegsdufwa
2022-12-02 18:22:14 QAQ: 6
2022-12-02 18:22:19 ---特朗普离开了聊天室---
2022-12-02 18:22:33 ---QAQ离开了聊天室---
2022-12-02 18:23:00 蔡徐坤: byebye
2022-12-02 18:25:00 蔡徐坤: 不是只有住在白宫的才叫总统
2022-12-02 18:25:03 ---蔡徐坤离开了聊天室---
```

```
C:\Windows\System32\cmd.exe
Microsoft Windows [版本 10.0.19044.2130]
(c) Microsoft Corporation. 保留所有权利。

E:\北航\课业\大三上\现代程序设计技术\week13>python week13_homework_chatter.py 蔡徐坤
2022-12-02 18:21:01 ---欢迎蔡徐坤进入聊天室---
大家好！我是新来的实习生2022-12-02 18:21:17 特朗普: memememememe
2022-12-02 18:21:32 蔡徐坤: 大家好！我是新
大家好！我是新来的实习生蔡徐坤
2022-12-02 18:21:57 蔡徐坤: 大家好！我是新来的实习生蔡徐坤
我会唱跳rap打篮球
2022-12-02 18:22:09 蔡徐坤: 我会唱跳rap打篮球
2022-12-02 18:22:11 特朗普: sdavhjadukbausbxayshuxcvsehakjfhgduagotuywegsdufwau7igxcgsagdcaia
不是只有住在白宫的才叫总统2022-12-02 18:22:14 QAQ: 6
2022-12-02 18:22:19 ---特朗普离开了聊天室---2022-12-02 18:22:33 ---QAQ离开了聊天室---
byebye
2022-12-02 18:23:00 蔡徐坤: byebye
不是只有住在白宫的才叫总统
2022-12-02 18:25:00 蔡徐坤: 不是只有住在白宫的才叫总统
exit
2022-12-02 18:25:03 ---蔡徐坤离开了聊天室---
聊天记录已导出至蔡徐坤_log.txt

E:\北航\课业\大三上\现代程序设计技术\week13>
```

```
*蔡徐坤_log.txt - 记事本
文件(F) 编辑(E) 格式(O) 查看(V) 帮助(H)
2022-12-02 18:21:01 ---欢迎蔡徐坤进入聊天室---
2022-12-02 18:21:17 特朗普: memememememe
2022-12-02 18:21:32 蔡徐坤: 大家好！我是新
2022-12-02 18:21:57 蔡徐坤: 大家好！我是新来的实习生蔡徐坤
2022-12-02 18:22:09 蔡徐坤: 我会唱跳rap打篮球
2022-12-02 18:22:11 特朗普: sdavhjadukbausbxayshuxcvsehakjfhgduagotuywegsdufwau7igxcgsagdcaia
2022-12-02 18:22:14 QAQ: 6
2022-12-02 18:22:19 ---特朗普离开了聊天室---
2022-12-02 18:22:33 ---QAQ离开了聊天室---
2022-12-02 18:23:00 蔡徐坤: byebye
2022-12-02 18:25:00 蔡徐坤: 不是只有住在白宫的才叫总统
2022-12-02 18:25:03 ---蔡徐坤离开了聊天室---
```

```
C:\Users\HuangJun0521\Desktop\新建文件夹>python week13_homework_chatter.py 特朗普
2022-12-02 18:20:11 ---欢迎特朗普进入聊天室---
nihao
2022-12-02 18:20:16 特朗普: nihao
make Ameri2022-12-02 18:20:21 QAQ: 好!
ca great again!
2022-12-02 18:20:31 特朗普: make America great again!
2022-12-02 18:21:01 ---欢迎蔡徐坤进入聊天室---
memememememe
2022-12-02 18:21:17 特朗普: memememememe
2022-12-02 18:21:32 蔡徐坤: 大家好! 我是新
2022-12-02 18:21:57 蔡徐坤: 大家好! 我是新来的实习生蔡徐坤
sdavhjadukbausbxayshuxcvsehakjfhduagotuywegsdufwau7igxcgsagdc2022-12-02 18:22:09 蔡徐坤: 我会唱跳rap打篮球
uia
2022-12-02 18:22:11 特朗普: sdavhjadukbausbxayshuxcvsehakjfhduagotuywegsdufwau7igxcgsagdcuia
2022-12-02 18:22:14 QAQ: 6
exit
聊天记录已导出至特朗普_log.txt
```

特朗普_log - 记事本

文件 编辑 查看

2022-12-02 18:20:11 ---欢迎特朗普进入聊天室---
2022-12-02 18:20:16 特朗普: nihao
2022-12-02 18:20:21 QAQ: 好!
2022-12-02 18:20:31 特朗普: make America great again!
2022-12-02 18:21:01 ---欢迎蔡徐坤进入聊天室---
2022-12-02 18:21:17 特朗普: memememememe
2022-12-02 18:21:32 蔡徐坤: 大家好! 我是新
2022-12-02 18:21:57 蔡徐坤: 大家好! 我是新来的实习生蔡徐坤
2022-12-02 18:22:09 蔡徐坤: 我会唱跳rap打篮球
2022-12-02 18:22:11 特朗普: sdavhjadukbausbxayshuxcvsehakjfhduagotuywegsdufwau7igxcgsagdcuia
2022-12-02 18:22:14 QAQ: 6

行 1, 列 1100%Windows (CRLF)UTF-8

```
命令提示符
ConnectionRefusedError: [WinError 10061] 由于目标计算机积极拒绝，无法连接。

C:\Users\不妙的computer\Desktop>python week13_homework_chatter.py QAQ
Traceback (most recent call last):
  File "week13_homework_chatter.py", line 60, in <module>
    chatter.start(sys.argv[1])
  File "week13_homework_chatter.py", line 18, in start
    self._client.connect((self._ip, self._port))
ConnectionRefusedError: [WinError 10061] 由于目标计算机积极拒绝，无法连接。

C:\Users\不妙的computer\Desktop>python week13_homework_chatter.py QAQ
2022-12-02 18:19:42 ---欢迎QAQ进入聊天室---
2022-12-02 18:20:11 ---欢迎特朗普进入聊天室---
2022-12-02 18:20:16 特朗普: nihao
好!
2022-12-02 18:20:21 QAQ: 好!
2022-12-02 18:20:31 特朗普: make America great again!
2022-12-02 18:21:01 ---欢迎蔡徐坤进入聊天室---
2022-12-02 18:21:17 特朗普: memememememe
2022-12-02 18:21:32 蔡徐坤: 大家好! 我是新
2022-12-02 18:21:57 蔡徐坤: 大家好! 我是新来的实习生蔡徐坤
2022-12-02 18:22:09 蔡徐坤: 我会唱跳rap打篮球
2022-12-02 18:22:11 特朗普: sdavhj dukbausbxayshuxcvsehakjfh dguagotuywegsdufwau7igxcgsagdcuia
6
2022-12-02 18:22:14 QAQ: 6
2022-12-02 18:22:19 ---特朗普离开了聊天室---
exit
聊天记录已导出至QAQ_log.txt

C:\Users\不妙的computer\Desktop>
```

```
QAQ_log.txt - 记事本
文件(F)  编辑(E)  格式(O)  查看(V)  帮助(H)
2022-12-02 18:19:42 ---欢迎QAQ进入聊天室---
2022-12-02 18:20:11 ---欢迎特朗普进入聊天室---
2022-12-02 18:20:16 特朗普: nihao
2022-12-02 18:20:21 QAQ: 好!
2022-12-02 18:20:31 特朗普: make America great again!
2022-12-02 18:21:01 ---欢迎蔡徐坤进入聊天室---
2022-12-02 18:21:17 特朗普: memememememe
2022-12-02 18:21:32 蔡徐坤: 大家好! 我是新
2022-12-02 18:21:57 蔡徐坤: 大家好! 我是新来的实习生蔡徐坤
2022-12-02 18:22:09 蔡徐坤: 我会唱跳rap打篮球
2022-12-02 18:22:11 特朗普:
sdavhj dukbausbxayshuxcvsehakjfh dguagotuywegsdufwau7igxcgsagdcuia
2022-12-02 18:22:14 QAQ: 6
2022-12-02 18:22:19 ---特朗普离开了聊天室---

第 1 行, 第 1 列    100%    Windows (CRLF)    UTF-8
```