

Report of Assignment

Student Name: Sun Zhenhang Student ID: z5231733

(Using Python 3.7)

1. Program Design:

In this assignment, I use two major modules: the server program and client program. The server program can serve multiple clients.

- 1) First, I simply establish a TCP connection between server and a single client, and implement a “Login System”.
- 2) Then I add a timeout function to test whether the client is still active, if not, the server will disconnect with this client.
- 3) Next, I use the “thread” to allow the server to connect with multiple clients.
- 4) After accomplishing this, I start to apply the function of “message” and “broadcast” to achieve the communication among the clients.
- 5) And then I achieve the requirement of blacklist and do some modifications in “message” and “broadcast”.
- 6) Finally, I try to implement “P2P”, which can transmit information without the server, to this architecture.

2. Operation and Message Format:

- 1) First, run the server program, when it is ready to accept client, then run the client program.
- 2) When you run the client successfully, you will occur these following messages:

```
Username: ethan
Invalid Username. Please try again
Username: yoda
Password: aaa
Invalid Password. Please try again
Password: bbb
Invalid Password. Please try again
Password: ccc
Invalid Password. Your account has been blocked. Please try again later
z5231733@vxl:/tmp_amd/adams/export/adams/4/z5231733/Desktop$
```

Then when you want to login in this user again within the block time, you will receive a message like:

```
Username: yoda
Password: aaa
Your account is blocked due to multiple login failures. Please try again later
```

After the block time, you can login this user again.

Suppose now I have logged in the server the client called “yoda”, and another client “hans” login after “yoda”. And I can do following operations, and each client will output corresponding messages:

```
z5231733@vx1:/tmp_amd/adams/export/adams/4/z5231733/Desktop$ python3 client.py
Username: yoda
Password: wise
Welcome to the greatest messaging application ever!
hans logged in
hans: hello, yoda
message hans hello, hans
Your message could not be delivered as the recipient has blocked you
message hans hello, hans
broadcast hi
Your message could not be delivered to some recipients
broadcast hi
hans logged out
logout
z5231733@vx1:/tmp_amd/adams/export/adams/4/z5231733/Desktop$
```

```
Terminal
File Edit View Terminal Go Help
z5231733@vx1:/tmp_amd/adams/export/adams/4/z5231733/Desktop$ python3 client.py
Username: hans
Password: falcon
Welcome to the greatest messaging application ever!
message yoda hello, yoda
block yoda
yoda has been blocked
unblock yoda
Has unblocked yoda
yoda: hello, hans
block yoda
yoda has been blocked
unblock yoda
Has unblocked yoda
yoda: hi
logout
z5231733@vx1:/tmp_amd/adams/export/adams/4/z5231733/Desktop$
```

For “whoelse” and “whoelsesince” commands:

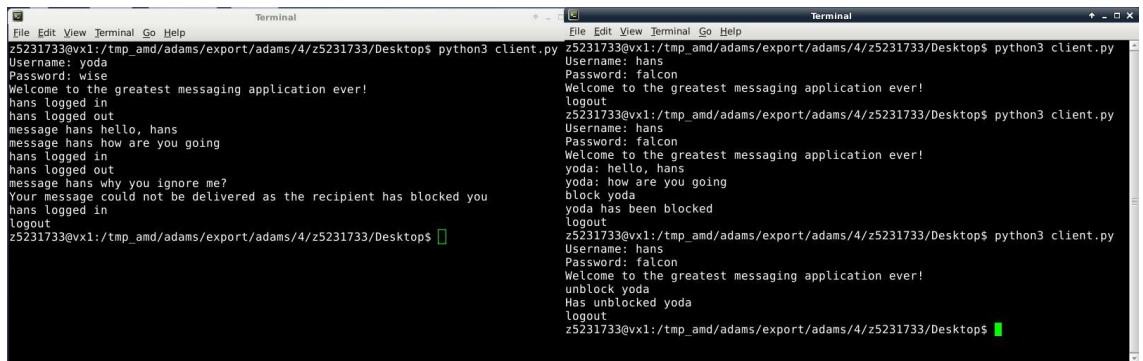
```
z5231733@vx1:/tmp_amd/adams/export/adams/4/z5231733/Desktop$ python3 client.py
Username: yoda
Password: wise
Welcome to the greatest messaging application ever!
hans logged in
whoelse
hans
logout
z5231733@vx1:/tmp_amd/adams/export/adams/4/z5231733/Desktop$
```

```
Terminal
File Edit View Terminal Go Help
z5231733@vx1:/tmp_amd/adams/export/adams/4/z5231733/Desktop$ python3 client.py
Username: hans
Password: falcon
Welcome to the greatest messaging application ever!
whoelse
yoda
whoelsesince 10
yoda
yoda logged out
whoelsesince 10
yoda
whoelsesince 5
No other users has logged in with the past 5 seconds
whoelsesince 100
yoda
logout
z5231733@vx1:/tmp_amd/adams/export/adams/4/z5231733/Desktop$
```

For timeout:

```
File Edit View Terminal Go Help
z5231733@vx1:/tmp_amd/adams/export/adams/4/z5231733/Desktop$ python3 client.py
Username: yoda
Password: wise
Welcome to the greatest messaging application ever!
z5231733@vx1:/tmp_amd/adams/export/adams/4/z5231733/Desktop$
```

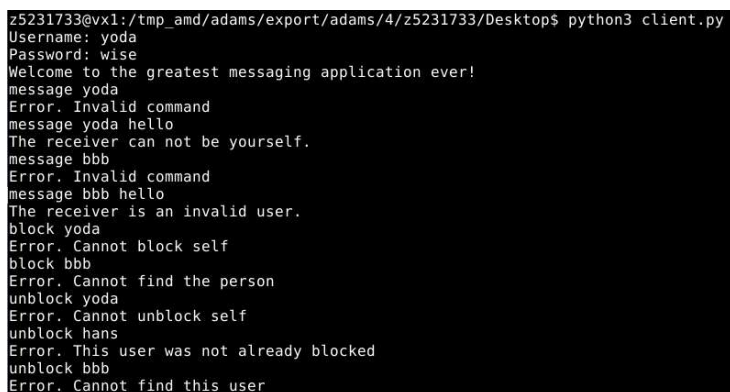
And “yoda” can send message to “hans” if “hans” is offline and does not block yoda:



```
z5231733@vx1:/tmp_amd/adams/export/adams/4/z5231733/Desktop$ python3 client.py
Username: yoda
Password: wise
Welcome to the greatest messaging application ever!
hans logged in
hans logged out
message hans hello, hans
message hans how are you going
hans logged in
hans logged out
message hans why you ignore me?
Your message could not be delivered as the recipient has blocked you
hans logged in
logout
z5231733@vx1:/tmp_amd/adams/export/adams/4/z5231733/Desktop$

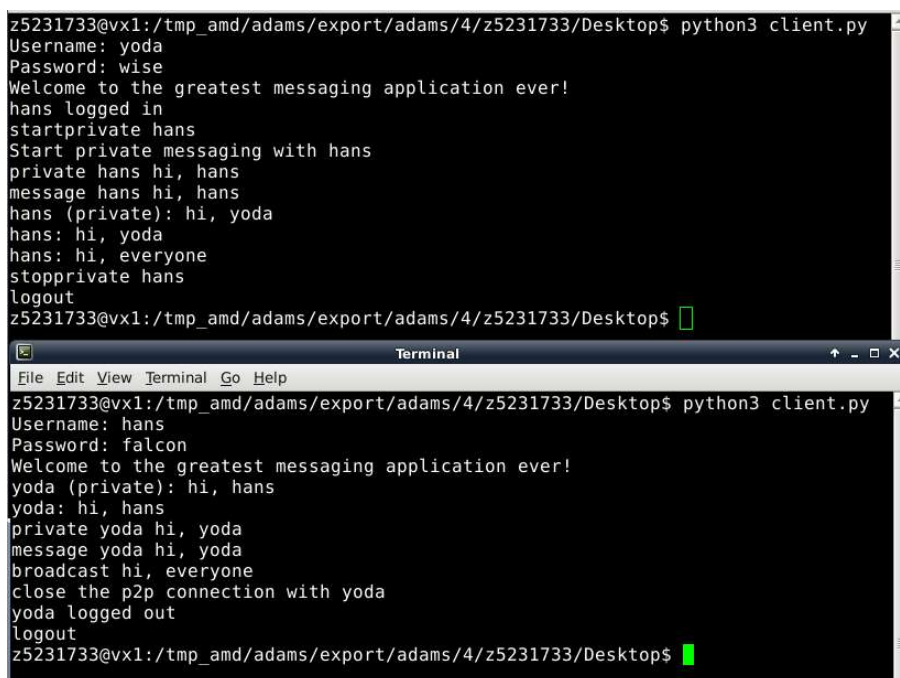
z5231733@vx1:/tmp_amd/adams/export/adams/4/z5231733/Desktop$ python3 client.py
Username: hans
Password: falcon
Welcome to the greatest messaging application ever!
logout
z5231733@vx1:/tmp_amd/adams/export/adams/4/z5231733/Desktop$ python3 client.py
Username: hans
Password: falcon
Welcome to the greatest messaging application ever!
yoda: hello, hans
yoda: how are you going
block yoda
yoda has been blocked
logout
z5231733@vx1:/tmp_amd/adams/export/adams/4/z5231733/Desktop$ python3 client.py
Username: hans
Password: falcon
Welcome to the greatest messaging application ever!
unlock yoda
Has unblocked yoda
logout
z5231733@vx1:/tmp_amd/adams/export/adams/4/z5231733/Desktop$
```

Any invalid command are shown below:



```
z5231733@vx1:/tmp_amd/adams/export/adams/4/z5231733/Desktop$ python3 client.py
Username: yoda
Password: wise
Welcome to the greatest messaging application ever!
message yoda
Error. Invalid command
message yoda hello
The receiver can not be yourself.
message bbb
Error. Invalid command
message bbb hello
The receiver is an invalid user.
block yoda
Error. Cannot block self
block bbb
Error. Cannot find the person
unlock yoda
Error. Cannot unblock self
unlock hans
Error. This user was not already blocked
unlock bbb
Error. Cannot find this user
```

- 3) Then, if “yoda” want to establish a private connection with “hans”, and they can do like this:



```
z5231733@vx1:/tmp_amd/adams/export/adams/4/z5231733/Desktop$ python3 client.py
Username: yoda
Password: wise
Welcome to the greatest messaging application ever!
hans logged in
startprivate hans
Start private messaging with hans
private hans hi, hans
message hans hi, hans
hans (private): hi, yoda
hans: hi, yoda
hans: hi, everyone
stopprivate hans
logout
z5231733@vx1:/tmp_amd/adams/export/adams/4/z5231733/Desktop$

z5231733@vx1:/tmp_amd/adams/export/adams/4/z5231733/Desktop$ python3 client.py
Username: hans
Password: falcon
Welcome to the greatest messaging application ever!
yoda (private): hi, hans
yoda: hi, hans
private yoda hi, yoda
message yoda hi, yoda
broadcast hi, everyone
close the p2p connection with yoda
yoda logged out
logout
z5231733@vx1:/tmp_amd/adams/export/adams/4/z5231733/Desktop$
```