In this homework, you will write a pair of Instant Messenger client and server. The requirements of the Messenger system are as follows.

1. The Messenger client operates in dual modes: command mode and chatting mode. (10%)

e.g.,

> listuser

john

mary

> talk mary

Hello!

How are you?

> logout

2. A user can log in on the Messenger server with a pre-built account. The password input should be invisible. (20%)

e.g.,

login: john

password:

>

3. The user can list on-line users on the server.　(10%)

4. A user can send messages to another on-line user, or start a conversation with him or her.

(20%)

e.g.,

> send mary hello

> talk mary

...

5. A user can broadcast a message to all on-line users. (10%)

e.g.,

> broadcast hello

6. A user can leave an off-line message to another, and can see the off-line message when he/she logs in.

(10%)

After login, e.g.,

Message from john: Hi!

7. A user can log out the server. (5%)

8. Add 5 points for each new function.

You do not have to design a GUI like Live Messenger. A text-mode interface is pretty fine. The server can be on an arbitrary port.

Hint: You can turn off echoing in getting passwords by one of the two methods.

```
>>> from getpass import getpass
>>> getpass()
Password:
```

or

```
>>> import os
>>> os.system("stty -echo")
....
>>> os.system("stty echo")
```