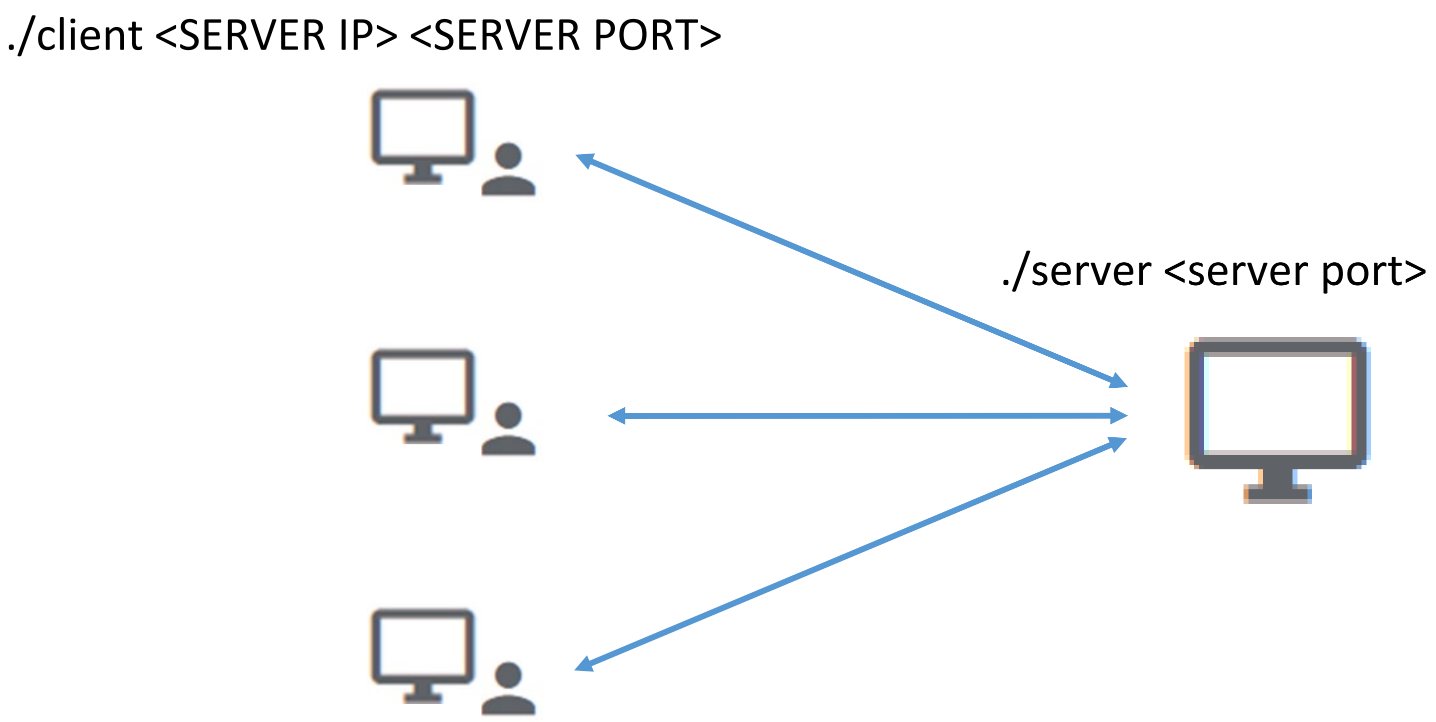
First Mini Program

Multi-client Chatroom

10/28

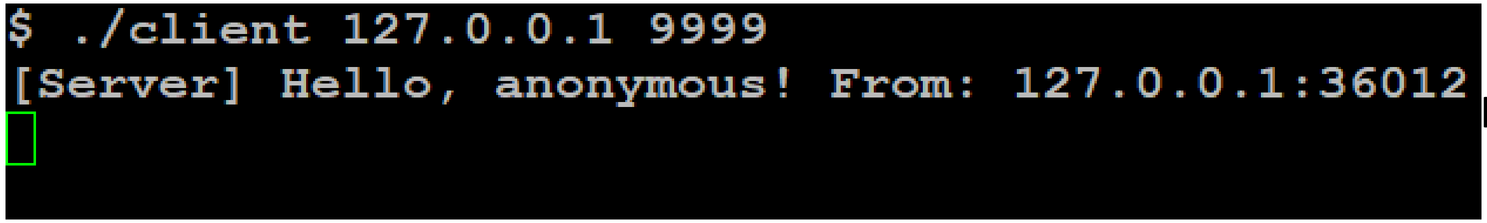
Introduce

A multiclient chatroom. When clients login, clients can send some command to server, and server will execute correspond action.



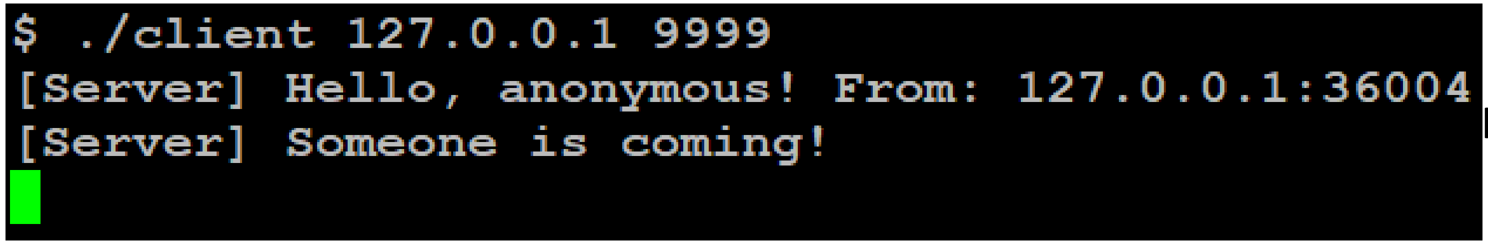
Hello Message

When a client login, server will send message to inform client login success and announce other users a new user is coming.



```
$ ./client 127.0.0.1 9999
[Server] Hello, anonymous! From: 127.0.0.1:36012
```

In Client A terminal

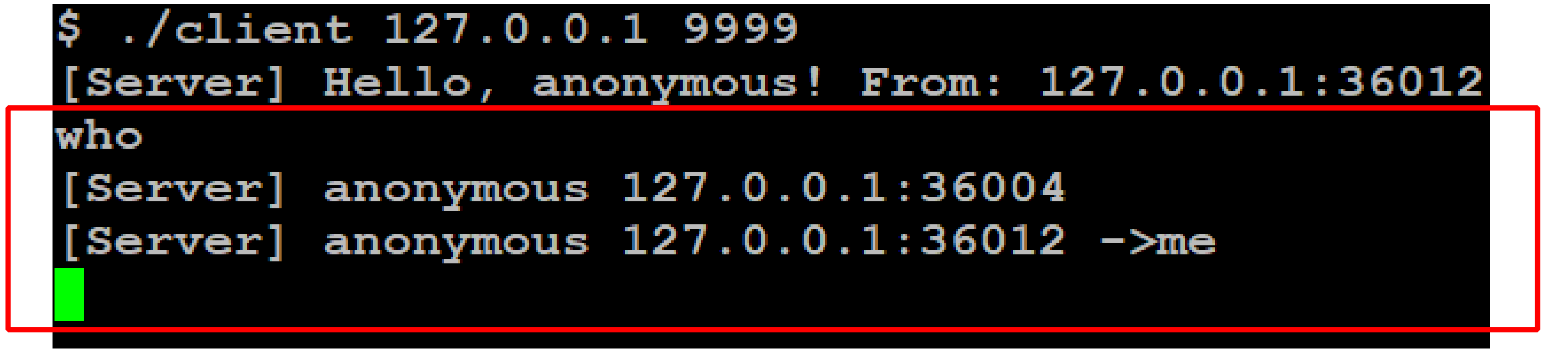


```
$ ./client 127.0.0.1 9999
[Server] Hello, anonymous! From: 127.0.0.1:36004
[Server] Someone is coming!
```

In Client B terminal

Who Message - who

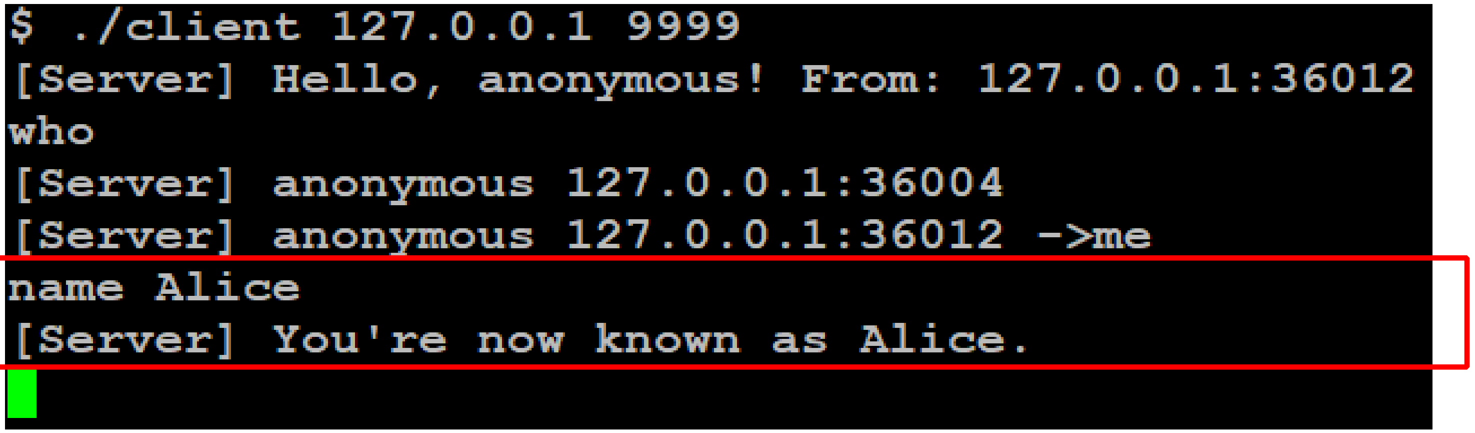
Command that can list all users online. The response message need to tag which user is the client.



```
$ ./client 127.0.0.1 9999
[Server] Hello, anonymous! From: 127.0.0.1:36012
who
[Server] anonymous 127.0.0.1:36004
[Server] anonymous 127.0.0.1:36012 ->me
```

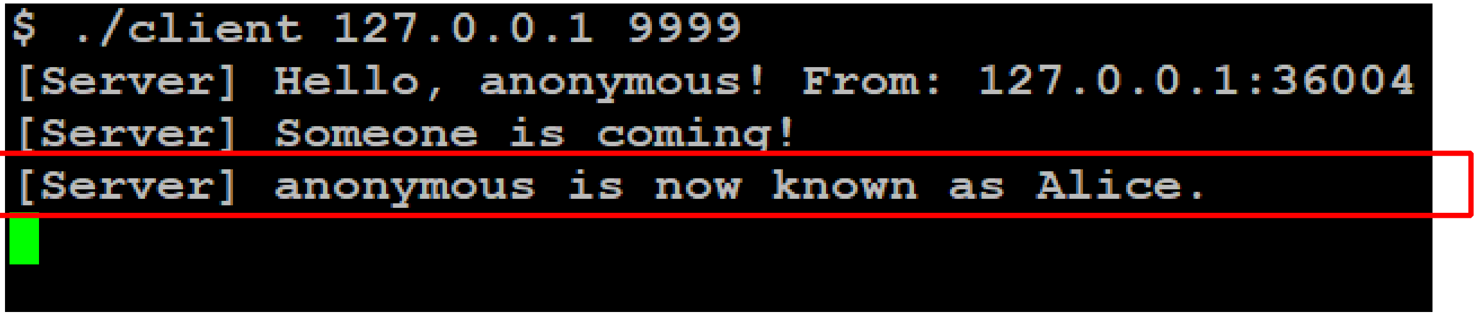
Change Username Message - name

Command to change user name. Server will broadcast other users when a user change its name successfully. (New name has some limitation)



```
$ ./client 127.0.0.1 9999
[Server] Hello, anonymous! From: 127.0.0.1:36012
who
[Server] anonymous 127.0.0.1:36004
[Server] anonymous 127.0.0.1:36012 ->me
name Alice
[Server] You're now known as Alice.
```

In Client A terminal

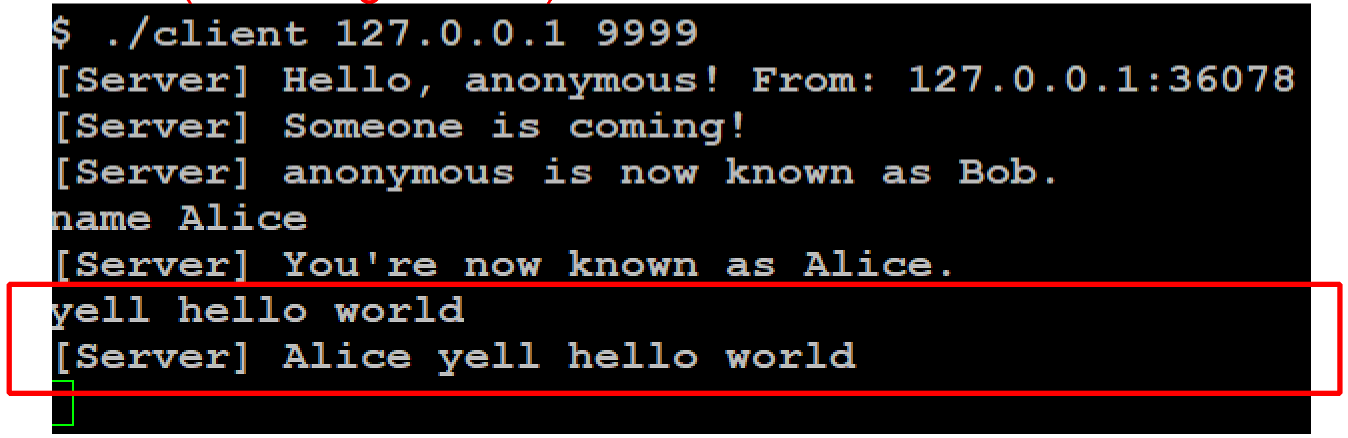


```
$ ./client 127.0.0.1 9999
[Server] Hello, anonymous! From: 127.0.0.1:36004
[Server] Someone is coming!
[Server] anonymous is now known as Alice.
```

In Client B terminal

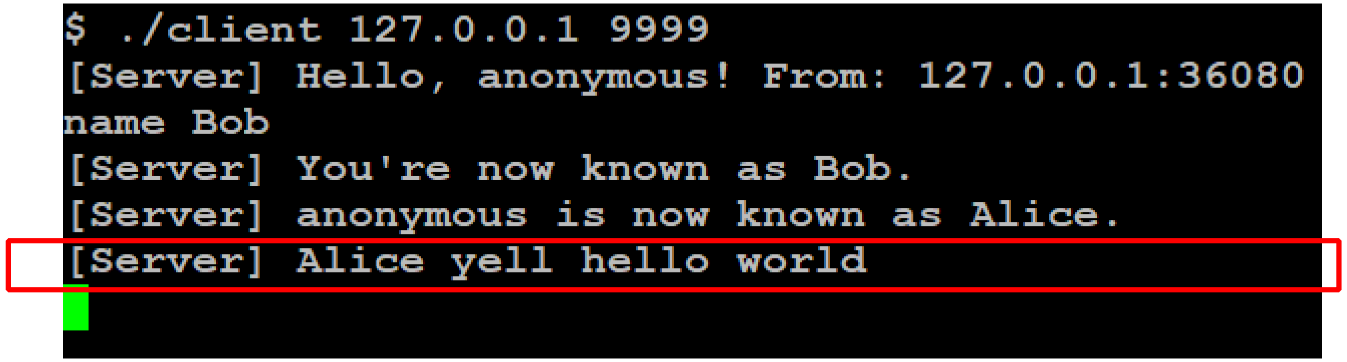
Broadcast Message - yell

User can use this command to broadcast message. Server will send the message to every user (including sender).



```
$ ./client 127.0.0.1 9999
[Server] Hello, anonymous! From: 127.0.0.1:36078
[Server] Someone is coming!
[Server] anonymous is now known as Bob.
name Alice
[Server] You're now known as Alice.
yell hello world
[Server] Alice yell hello world
```

In Client A terminal

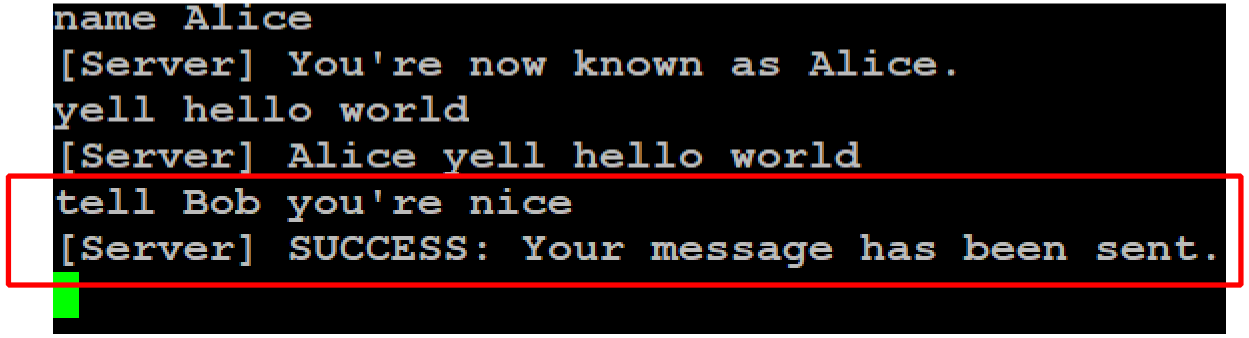


```
$ ./client 127.0.0.1 9999
[Server] Hello, anonymous! From: 127.0.0.1:36080
name Bob
[Server] You're now known as Bob.
[Server] anonymous is now known as Alice.
[Server] Alice yell hello world
```

In Client B terminal

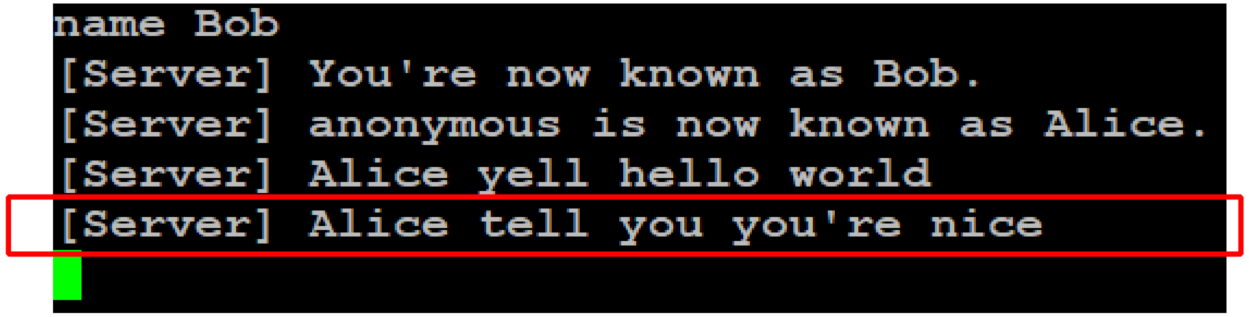
Private Message - tell

User can use this command to send private message to specific user.



```
name Alice
[Server] You're now known as Alice.
yell hello world
[Server] Alice yell hello world
tell Bob you're nice
[Server] SUCCESS: Your message has been sent.
```

In Client A termianl

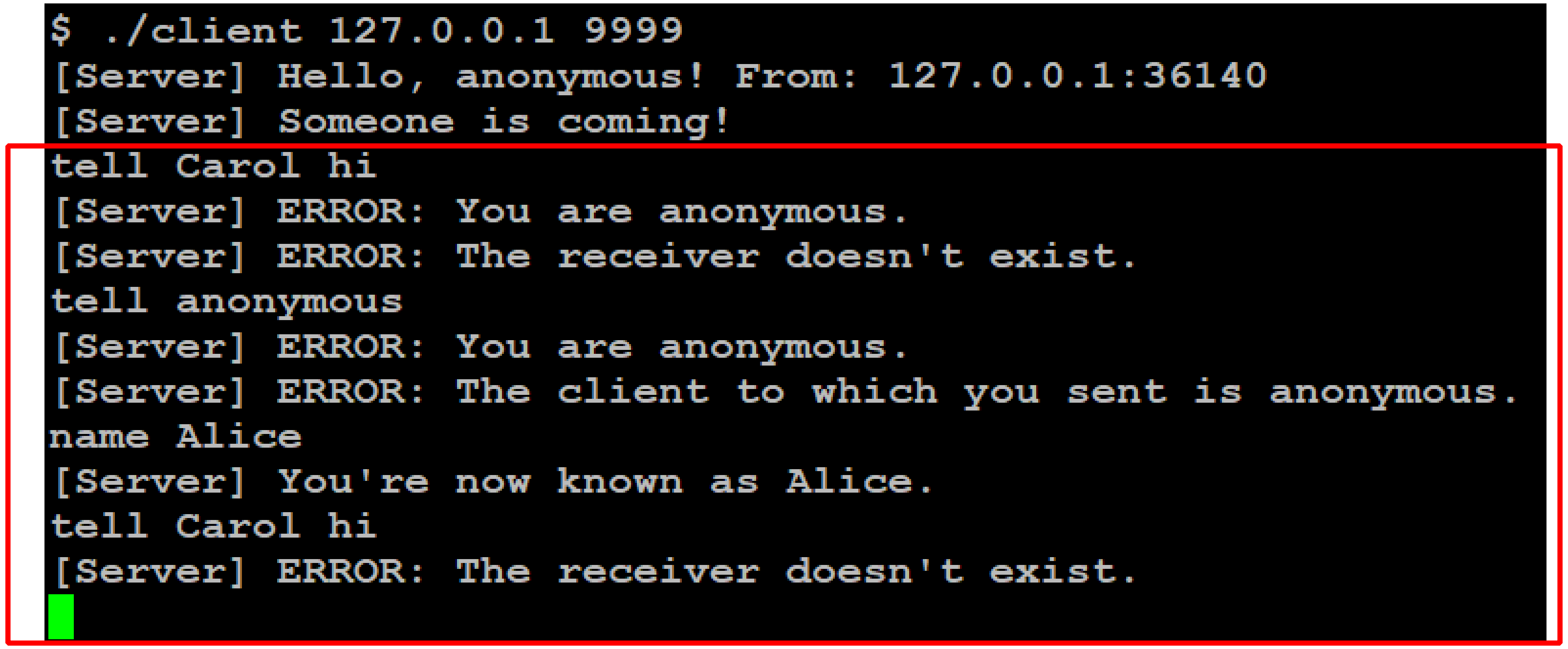


```
name Bob
[Server] You're now known as Bob.
[Server] anonymous is now known as Alice.
[Server] Alice yell hello world
[Server] Alice tell you you're nice
```

In Client B termianl

Wrong tell

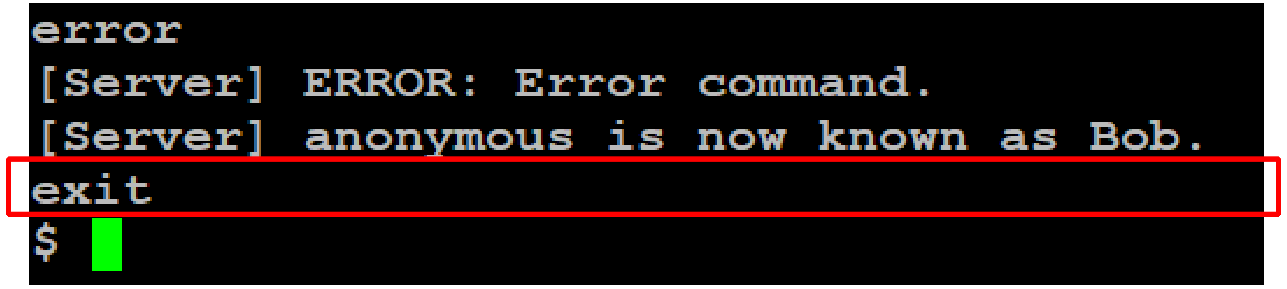
The names of sender and receiver must not be anonymous.



```
$ ./client 127.0.0.1 9999
[Server] Hello, anonymous! From: 127.0.0.1:36140
[Server] Someone is coming!
tell Carol hi
[Server] ERROR: You are anonymous.
[Server] ERROR: The receiver doesn't exist.
tell anonymous
[Server] ERROR: You are anonymous.
[Server] ERROR: The client to which you sent is anonymous.
name Alice
[Server] You're now known as Alice.
tell Carol hi
[Server] ERROR: The receiver doesn't exist.
```

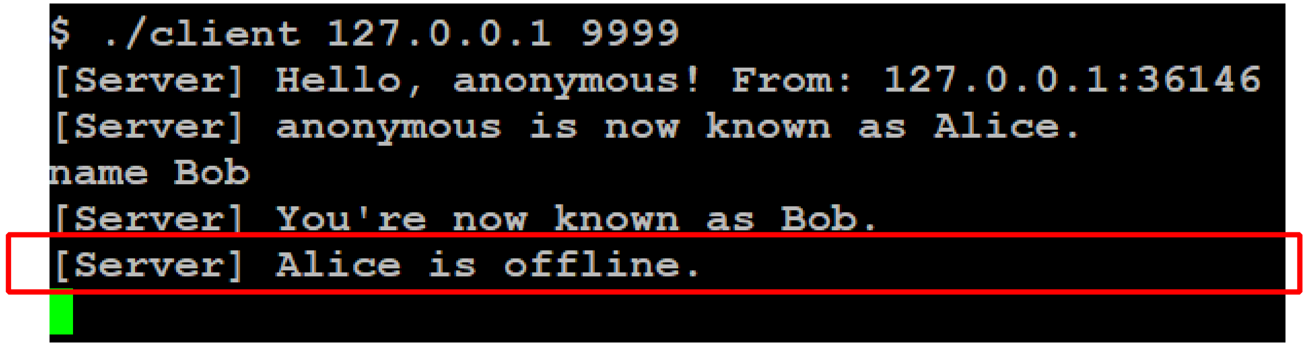
Log Out Message - exit

Clients type “exit” to logout. Server will broadcast to other users when someone logout.



```
error
[Server] ERROR: Error command.
[Server] anonymous is now known as Bob.
exit
$
```

In Client A termianl

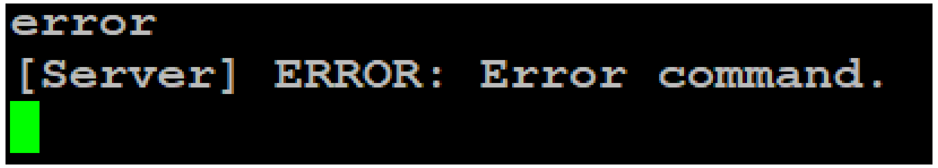


```
$ ./client 127.0.0.1 9999
[Server] Hello, anonymous! From: 127.0.0.1:36146
[Server] anonymous is now known as Alice.
name Bob
[Server] You're now known as Bob.
[Server] Alice is offline.
```

In Client B termianl

Error Command

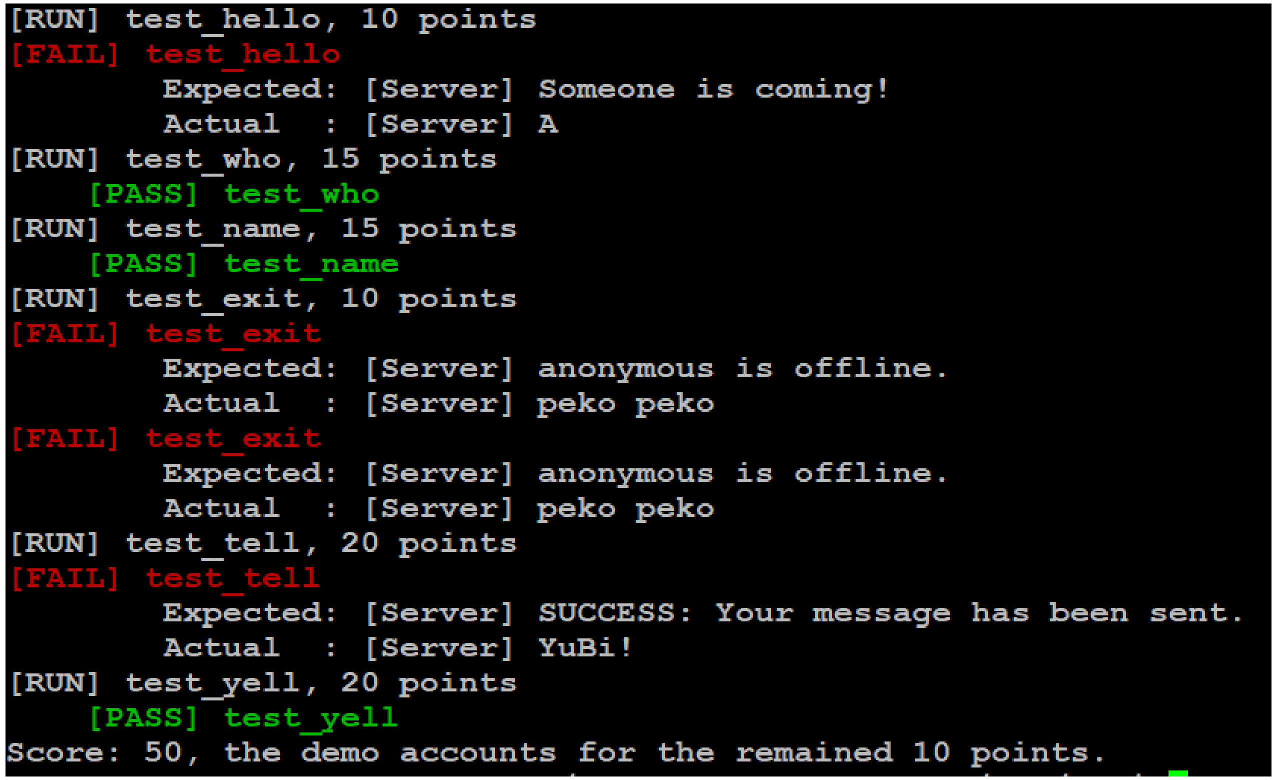
If server receive command not mention above, it will response an error message.



```
error
[Server] ERROR: Error command.
```

test.c

- make test



```
[RUN] test_hello, 10 points
[FAIL] test_hello
        Expected: [Server] Someone is coming!
        Actual  : [Server] A
[RUN] test_who, 15 points
    [PASS] test_who
[RUN] test_name, 15 points
    [PASS] test_name
[RUN] test_exit, 10 points
[FAIL] test_exit
        Expected: [Server] anonymous is offline.
        Actual  : [Server] peko peko
[FAIL] test_exit
        Expected: [Server] anonymous is offline.
        Actual  : [Server] peko peko
[RUN] test_tell, 20 points
[FAIL] test_tell
        Expected: [Server] SUCCESS: Your message has been sent.
        Actual  : [Server] YuBi!
[RUN] test_yell, 20 points
    [PASS] test_yell
Score: 50, the demo accounts for the remained 10 points.
```

It just help you find error, but won’t test all possible situation.

Requirement

1. All messages transmitted between a server and a client should end with a newline ('\n').

1. Client should sends message received from stdin to server directly without modification.

1. Client won't generate any message by itself!!! Every message which is printed on client's screen is from server. Client only needs to make sure whether it has received every message from server.

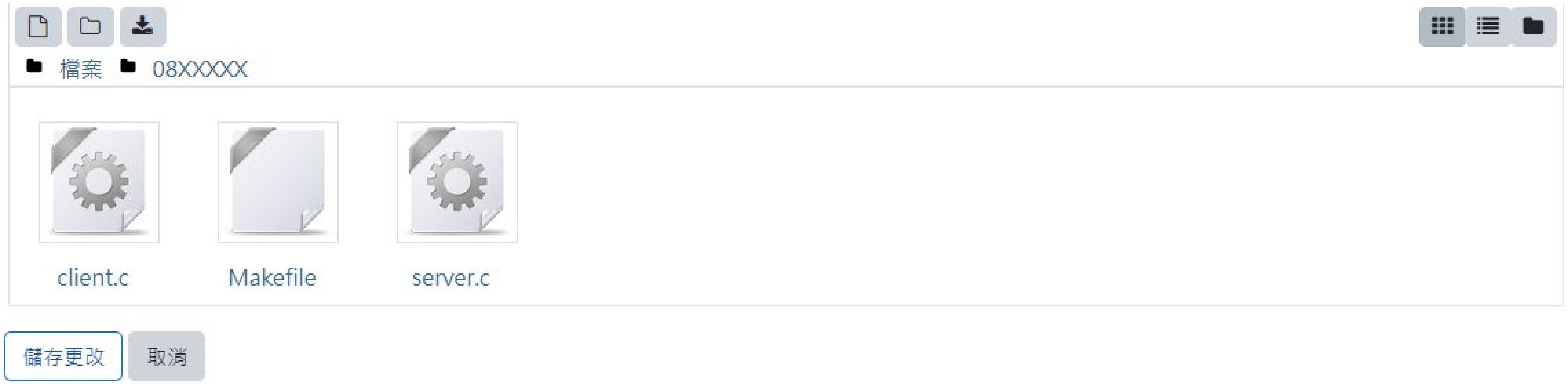
1. Server/Client should NOT crash or be hanged.

##Hint: You can use select() for constructing the Server/Client program

Attention

1. Due Date: **2021/11/15 23:59**
2. Please upload your server.c/cpp, client.c/cpp, and Makefile separately (see the next page).
3. GNU make (makefile) should be used to compile your codes.
   If TAs are unable to compile your codes with a single `$ make` command, you are not allowed to demo.
4. Each problem that leads to fail to run (compile) your code will discount your score by 0.75.
5. If you have any questions, please discuss with TAs and classmates in hw1 **forum**.
6. Demo will be announced later. Please remember to select your demo time after we announce! If your name doesn't exist on our demo form, you won’t be allowed to demo your homework.

Attention



Attention

1. Please make yourself get accustomed to look functions up in official linux manual page and cppreference.
2. Only these three domains will be authorized to be used while hand-on exam
3. https://linux.die.net/man/
4. https://en.cppreference.com/w/
5. https://www.cplusplus.com/

Q&A