

CSE 489/589

Programming Assignment 1 Stage 2 Report

Text Chat Application

Notes: (IMPORTANT)

- Your submission will **NOT** be graded without submitting this report. It is required to use this report template. Do not add sections for Stage 1, as they will not be graded.
- One of your group members select <File> - <Make a copy> to make a copy of this report for your group, and share that Google Doc copy with your teammates so that they can also edit it.
- Report your work in each section (optional). Describe the method you used, the obstacles you met, how you solved them, and the results. You can take screenshots at key points. There are NO hard requirements for your description.
- For a certain command/event, if you successfully implemented it, **attach the screenshot of the result from the grader (required)**. You will get full points if it can pass the corresponding test case of the automated grader.
- For a certain command/event, if you tried but failed to implement it, properly describe your work. If you can get some points (not full) from the grader, also **attach the screenshot of the result from the grader (required)**. We will partially grade it based on the work you did.
- **Do NOT claim anything you didn't implement.** If you didn't try on a certain command or event, leave that section blank. We will randomly check your code, and if it does not match the work you claimed, you and your group won't get any partial grade score for this WHOLE assignment.
- This report has 5 bonus points. Bonus points grading will be based on your **description** in each section, including the sections where you got full points from the grader.
- After you finish, export this report as a PDF file and submit it on the UBLearns along with your tarball. For each group, only one member needs to make the submission.
- Maximum score for Stage 2: $58 + 5 = 63$

1. Group and Contributions

- Name of member 1:
 - UBITName: kajol (Kajol)
 - Contributions Implementation and documentation of respective functionality – Send, Statistics, Blocked, Send Exception Handling, Block Exception Handling, Blocked Exception Handling,
- Name of member 2:
 - UBITName: amehta9 (Aishwarya Mehta)
 - Contributions Implementation and documentation of respective functionality – Broadcast, Block, Unblock, Buffer, Logout, Unblocked Exception Handling

2. Test results

[0.0] AUTHOR (author)

Your submission will not be graded if the AUTHOR command fails to work.

Grader screenshot:

```
euston (~/.cse489889_assignment1/grader) > ./grader_controller -c ./grader.cfg -s ../kajol_pal.tar -t author
Reading configuration file: ./grader.cfg ...
Initializing grading servers ...

stones.cse.buffalo.edu
Uploading submission ...
  N Total  N Received N Xferd  Average Speed  Time  Time  Time Current
  Dload Upload Total  Spent  Left  Speed
100 631k  0  2 100 631k  1  497k 0:00:01 0:00:01 --|-- 497k
OK
Building submission ...
OK
Starting grading server ...
OK

euston.cse.buffalo.edu
Uploading submission ...
  N Total  N Received N Xferd  Average Speed  Time  Time  Time Current
  Dload Upload Total  Spent  Left  Speed
100 631k  0  2 100 631k  1  499k 0:00:01 0:00:01 --|-- 500k
OK
Building submission ...
OK
Starting grading server ...
OK

embankment.cse.buffalo.edu
Uploading submission ...
  N Total  N Received N Xferd  Average Speed  Time  Time  Time Current
  Dload Upload Total  Spent  Left  Speed
100 631k  0  2 100 631k  1  498k 0:00:01 0:00:01 --|-- 500k
OK
Building submission ...
OK
Starting grading server ...
OK

underground.cse.buffalo.edu
Uploading submission ...
  N Total  N Received N Xferd  Average Speed  Time  Time  Time Current
  Dload Upload Total  Spent  Left  Speed
100 631k  0  2 100 631k  1  499k 0:00:01 0:00:01 --|-- 501k
OK
Building submission ...
OK
Starting grading server ...
OK

highgate.cse.buffalo.edu
Uploading submission ...
  N Total  N Received N Xferd  Average Speed  Time  Time  Time Current
  Dload Upload Total  Spent  Left  Speed
100 631k  0  2 100 631k  1  496k 0:00:01 0:00:01 --|-- 497k
OK
Building submission ...
OK
Starting grading server ...
OK

Grading for: author ...
TRUE
euston (~/.cse489889_assignment1/grader) > █
```

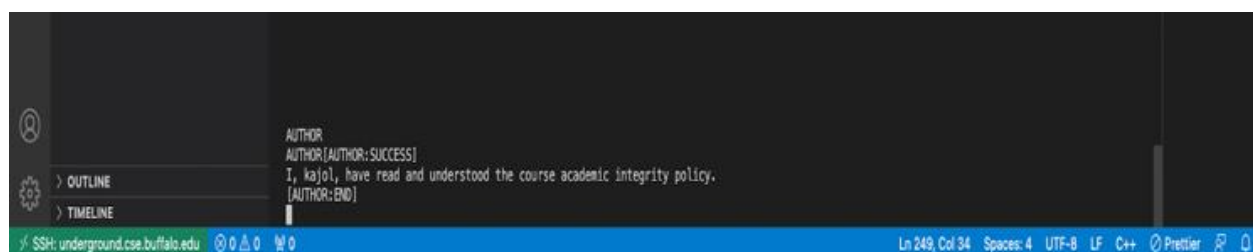
Description: Whether the application is launched as a server or a client, this sequence of commands functions.

INPUT:

AUTHOR

OUTPUT:

I, kajol, have read and understood the course academic integrity policy.



[15.0] SEND (send)

Grader screenshot:

```
-- kajol@euston:grader -- ssh kajol@euston.cse.buffalo.edu
5.0
[kajol@euston grader]$ ./grader_controller -c ../grader.cfg -s ../kajol_pal.tar -t send
Reading configuration file: ./grader.cfg ...
Initializing grading servers ...

stones.cse.buffalo.edu
Uploading submission ...
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
   Dload  Upload   Total   Spent    Left   Speed
100 596k    0    2 100 596k    1 553k  0:00:01  0:00:01 --:--:-- 554k
OK
Building submission ...
OK
Starting grading server ...
OK

euston.cse.buffalo.edu
Uploading submission ...
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
   Dload  Upload   Total   Spent    Left   Speed
100 596k    0    2 100 596k    1 557k  0:00:01  0:00:01 --:--:-- 559k
OK
Building submission ...
OK
Starting grading server ...
OK

embankment.cse.buffalo.edu
Uploading submission ...
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
   Dload  Upload   Total   Spent    Left   Speed
100 596k    0    2 100 596k    1 556k  0:00:01  0:00:01 --:--:-- 557k
OK
Building submission ...
OK
Starting grading server ...
OK

underground.cse.buffalo.edu
Uploading submission ...
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
   Dload  Upload   Total   Spent    Left   Speed
100 596k    0    2 100 596k    1 556k  0:00:01  0:00:01 --:--:-- 557k
OK
Building submission ...
OK
Starting grading server ...
OK

highgate.cse.buffalo.edu
Uploading submission ...
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
   Dload  Upload   Total   Spent    Left   Speed
100 596k    0    2 100 596k    1 557k  0:00:01  0:00:01 --:--:-- 559k
OK
Building submission ...
OK
Starting grading server ...
OK

Grading for: send ...
15.0
[kajol@euston grader]$
```

Description:

Send message:

- Send a message to the client, using client-ip as the IP address. The message can only be 256 bytes long.
- It can only contain legal ASCII characters.
- The send function must start sending a message from the specified socket to its peer. Only when the socket is connected should the function send a message.

AT CLIENT END:

```
[PA1-Client@SE489/589]$ SEND 128.205.36.36 hi I am Kajol
send process:
[SEND:SUCCESS]
[SEND:END]

[PA1-Client@SE489/589]$ [RECEIVED:SUCCESS]
msg from:128.205.36.36
[msg]:hi I am Kajol
[RECEIVED:END]

[PA1-Client@SE489/589]$
```

AT SERVER END:

```
[RELAYED:SUCCESS]
msg from:128.205.36.36, to:128.205.36.36
[msg]:hi I am Kajol
[RELAYED:END]
```

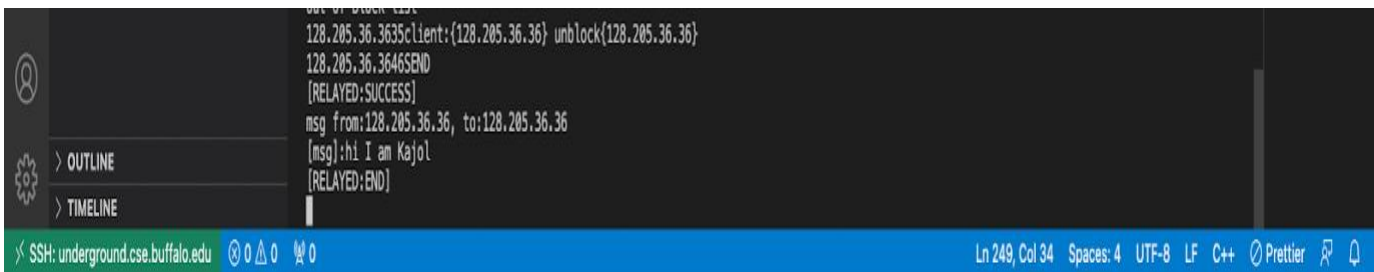
[EVENT]: Message Relayed

Description:

The server relays all messages sent and received between clients. If a client with the IP address: <from-client-ip> sends a message to another client with the IP address: <to-client-ip>, printed the message using the format string:

("msg from:%s, to:%s\n[msg]:%s\n", from-client-ip, to-client-ip, msg)

- If a broadcast message is sent, the value for "to-client-ip" will be 255.255.255.255.
- Used command str: RELAYED for printing/logging reasons.



```
128.205.36.365Client:{128.205.36.36} unblock{128.205.36.36}
128.205.36.3646SEND
[RELAYED:SUCCESS]
msg from:128.205.36.36, to:128.205.36.36
[msg]:hi I am Kajol
[RELAYED:END]
```

[EVENT]: Message Received

Description:

If a message with the following format string is received from a client with the IP address (client-ip):

("msg from:%s\n[msg]:%s\n", client-ip, msg)

It should be noted that "client-ip" in this case refers to the IP address of the sender, not the relaying server. Used command str: RECEIVED for printing/logging reasons.

[10.0] BROADCAST (broadcast)

Grader screenshot:

```
-- kajol@euston:grader -- ssh kajol@euston.cse.buffalo.edu
15.0
[kajol@euston grader]$ ./grader_controller -c ./grader.cfg -s ../kajol_pal.tar -t broadcast
Reading configuration file: ./grader.cfg ...
Initializing grading servers ...

stones.cse.buffalo.edu
Uploading submission ...
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
           Dload  Upload   Total   Spent    Left   Speed
100 596k    0    2 100 596k    1 546k  0:00:01  0:00:01 --:--:-- 547k
OK
Building submission ...
OK
Starting grading server ...
OK

euston.cse.buffalo.edu
Uploading submission ...
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
           Dload  Upload   Total   Spent    Left   Speed
100 596k    0    2 100 596k    1 555k  0:00:01  0:00:01 --:--:-- 557k
OK
Building submission ...
OK
Starting grading server ...
OK

embankment.cse.buffalo.edu
Uploading submission ...
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
           Dload  Upload   Total   Spent    Left   Speed
100 596k    0    2 100 596k    1 556k  0:00:01  0:00:01 --:--:-- 557k
OK
Building submission ...
OK
Starting grading server ...
OK

underground.cse.buffalo.edu
Uploading submission ...
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
           Dload  Upload   Total   Spent    Left   Speed
100 596k    0    2 100 596k    1 557k  0:00:01  0:00:01 --:--:-- 559k
OK
Building submission ...
OK
Starting grading server ...
OK

highgate.cse.buffalo.edu
Uploading submission ...
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
           Dload  Upload   Total   Spent    Left   Speed
100 596k    0    2 100 596k    1 538k  0:00:01  0:00:01 --:--:-- 557k
OK
Building submission ...
OK
Starting grading server ...
OK

Grading for: broadcast ...
10.0
[kajol@euston grader]$
```

Description:

To all clients who are logged in, message will be sent. Message can only be up to 256 bytes long and must only include legal ASCII characters.

This ought to be a broadcast with server assistance. To identify it as a broadcast, the transmitting client should only send one message to the server. The server then stores/buffers the message for the remaining clients and forwards/relays it to every client who is currently signed in.

The BROADCAST client will not get the exact identical message back.

```
[RECEIVED:END]
[PAI-Client@CSE489/589]$ BROADCAST Quiz was yesterday
[BROADCAST:SUCCESS]
[BROADCAST:END]
> OUTLINE
> TIMELINE
[PAI-Client@CSE489/589]$
```

[5.0] STATISTICS (statistics)

Grader screenshot:

```
-- kajol@euston:grader -- ssh kajol@euston.cse.buffalo.edu
[kajol@euston ~/$ cd grader/
[kajol@euston grader]$ ./grader_controller -c ./grader.cfg -s ../kajol_pal.tar -t statistics
Reading configuration file: ./grader.cfg ...
Initializing grading servers ...

stones.cse.buffalo.edu
Uploading submission ...
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
             Dload  Upload   Total   Spent    Left   Speed
100 596k    0   2 100 596k      1  543k  0:00:01  0:00:01 --:--:--  545k
OK
Building submission ...
OK
Starting grading server ...
OK

euston.cse.buffalo.edu
Uploading submission ...
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
             Dload  Upload   Total   Spent    Left   Speed
100 596k    0   2 100 596k      1  558k  0:00:01  0:00:01 --:--:--  559k
OK
Building submission ...
OK
Starting grading server ...
OK

embankment.cse.buffalo.edu
Uploading submission ...
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
             Dload  Upload   Total   Spent    Left   Speed
100 596k    0   2 100 596k      1  558k  0:00:01  0:00:01 --:--:--  552k
OK
Building submission ...
OK
Starting grading server ...
OK

underground.cse.buffalo.edu
Uploading submission ...
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
             Dload  Upload   Total   Spent    Left   Speed
100 596k    0   2 100 596k      1  551k  0:00:01  0:00:01 --:--:--  552k
OK
Building submission ...
OK
Starting grading server ...
OK

highgate.cse.buffalo.edu
Uploading submission ...
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
             Dload  Upload   Total   Spent    Left   Speed
100 596k    0   2 100 596k      1  558k  0:00:01  0:00:01 --:--:--  558k
OK
Building submission ...
OK
Starting grading server ...
OK

Grading for: statistics ...
5.0
[kajol@euston grader]$
```

Description:

(Describe how you implement the LOGIN and LIST commands)

Show statistics for each client and a numbered list of all clients who have ever logged in to the server (but who have not used the EXIT command). Depending on whether the client is currently logged in or out, the output should show the hostname, #messages-sent, #messages-received, and the current status: logged-in/logged-out, arranged by their listening port numbers, in ascending order.

Used the format string that follows:

The printf that follows prints out a single host. Repetition of the printf command

- Listed every host
- list_id: an item number in an integer
- hostname: fully qualified hostname in a null-terminated char array.
- num_msg_sent: integer representation of the client's message sending count
- num_msg_rcv: integer representation of the number of messages the client has received.
- status: logged-in or logged-out null-terminated char array

```
STATISTICS
STATISTICS(STATISTICS:SUCCESS)
1  underground.cse.buffalo.edu  2  2  logged-in
[STATISTICS:END]
```

[5.0] BLOCK (block)

Grader screenshot:

```
-- kajol@euston:grader -- ssh kajol@euston.cse.buffalo.edu
KeyboardInterrupt
Failed to execute script grader_controller
[kajol@euston grader]$ ./grader_controller -c ./grader.cfg -s ./../kajol_pa1.tar -t block
Reading configuration file: ./grader.cfg ...
Initializing grading servers ...

stones.cse.buffalo.edu
Uploading submission ...
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
             Dload  Upload  Total   Spent    Left   Speed
100 597k    0   2100 597k    1  525k  0:00:01  0:00:01 --:--:--  527k
OK
Building submission ...
OK
Starting grading server ...
OK

euston.cse.buffalo.edu
Uploading submission ...
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
             Dload  Upload  Total   Spent    Left   Speed
100 597k    0   2100 597k    1  559k  0:00:01  0:00:01 --:--:--  561k
OK
Building submission ...
OK
Starting grading server ...
OK

embanment.cse.buffalo.edu
Uploading submission ...
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
             Dload  Upload  Total   Spent    Left   Speed
100 597k    0   2100 597k    1  559k  0:00:01  0:00:01 --:--:--  561k
OK
Building submission ...
OK
Starting grading server ...
OK

underground.cse.buffalo.edu
Uploading submission ...
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
             Dload  Upload  Total   Spent    Left   Speed
100 597k    0   2100 597k    1  559k  0:00:01  0:00:01 --:--:--  560k
OK
Building submission ...
OK
Starting grading server ...
OK

highgate.cse.buffalo.edu
Uploading submission ...
  % Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
             Dload  Upload  Total   Spent    Left   Speed
100 597k    0   2100 597k    1  557k  0:00:01  0:00:01 --:--:--  559k
OK
Building submission ...
OK
Starting grading server ...
OK

Grading for: block ...
5.0
```

Description:

Block any broadcast or unicast messages coming from the client with the IP address: "client-ip." This blocking should be communicated to the server by the client implementation. Any messages from a blocked sender that are intended for the blocking client shouldn't be relayed or stored/buffered by the server. However, the blocked sender won't be aware of this blocking and should successfully complete the SEND command.

AT CLIENT

```
[PA1-Client@CSE489/589]$ BLOCK 128.205.36.36
Client block:(128.205.36.36){BLOCK:SUCCESS}
[BLOCK:BD]
```

AT SERVER

```
128.205.36.3633c1lent:(128.205.36.36) block(128.205.36.36)
out of Block List
```

[5.0] BLOCKED (b!ocked)

Grader screenshot:

```
-- kajol@euston:grader -- ssh kajol@euston.cse.buffalo.edu
0.0
[kajol@euston grader]$ ./grader_controller -c ./grader.cfg -s ../kajol_pa1.tar -t blocked
Reading configuration file: ./grader.cfg ...
Initializing grading servers ...

stones.cse.buffalo.edu
Uploading submission ...
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
   Dload  Upload  Total   Dload  Upload  Total   Spent    Left     Speed
100 596k    0    2 100 596k    1   549k  0:00:01  0:00:01 --:--:--   549k
OK
Building submission ...
OK
Starting grading server ...
OK

euston.cse.buffalo.edu
Uploading submission ...
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
   Dload  Upload  Total   Dload  Upload  Total   Spent    Left     Speed
100 596k    0    2 100 596k    1   559k  0:00:01  0:00:01 --:--:--   568k
OK
Building submission ...
OK
Starting grading server ...
OK

embankment.cse.buffalo.edu
Uploading submission ...
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
   Dload  Upload  Total   Dload  Upload  Total   Spent    Left     Speed
100 596k    0    2 100 596k    1   532k  0:00:01  0:00:01 --:--:--   533k
OK
Building submission ...
OK
Starting grading server ...
OK

underground.cse.buffalo.edu
Uploading submission ...
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
   Dload  Upload  Total   Dload  Upload  Total   Spent    Left     Speed
100 596k    0    2 100 596k    1   556k  0:00:01  0:00:01 --:--:--   557k
OK
Building submission ...
OK
Starting grading server ...
OK

highgate.cse.buffalo.edu
Uploading submission ...
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
   Dload  Upload  Total   Dload  Upload  Total   Spent    Left     Speed
100 596k    0    2 100 596k    1   552k  0:00:01  0:00:01 --:--:--   554k
OK
Building submission ...
OK
Starting grading server ...
OK

Grading for: blocked ...
5.0
[kajol@euston grader]$
```

Description:

Shown a numbered list of all the clients that the client with the IP address: <client-ip> has blocked. The output shows the hostname, IP address, and listening port numbers in increasing order, sorted by listening port numbers. The output format matches the LIST command exactly.

```
BLOCKED[BLOCKED:SUCCESS]
1 stones.cse.buffalo.edu      128.205.36.46      4002
[BLOCKED:END]

BLOCKED[BLOCKED:SUCCESS]
1 stones.cse.buffalo.edu      128.205.36.46      4002
[BLOCKED:END]
```


[2.5] UNBLOCK (unblock)

Grader screenshot:

Description:

Unblock a client with the IP address "client-ip" who was previously blocked. The server should be notified of the unblocking by the client implementation.

```
Starting grading server ...
OK

euston.cse.buffalo.edu
Uploading submission ...
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
           Dload  Upload   Total   Spent    Left     Speed
100 193k    0     2 100 193k      1 187k    0:00:01  0:00:01 --:--:-- 187k
OK
Building submission ...
OK
Starting grading server ...
OK

embankment.cse.buffalo.edu
Uploading submission ...
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
           Dload  Upload   Total   Spent    Left     Speed
100 193k    0     2 100 193k      1 186k    0:00:01  0:00:01 --:--:-- 187k
OK
Building submission ...
OK
Starting grading server ...
OK

underground.cse.buffalo.edu
Uploading submission ...
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
           Dload  Upload   Total   Spent    Left     Speed
100 193k    0     2 100 193k      1 186k    0:00:01  0:00:01 --:--:-- 186k
OK
Building submission ...
OK
Starting grading server ...
OK

highgate.cse.buffalo.edu
Uploading submission ...
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
           Dload  Upload   Total   Spent    Left     Speed
100 193k    0     2 100 193k      1 187k    0:00:01  0:00:01 --:--:-- 187k
OK
Building submission ...
OK
Starting grading server ...
OK

Grading for: unblock ...
2.5
```

AT CLIENT

```
[PAI-Client@CSE489/589]$ UNBLOCK 128.205.36.36
cClient: unblock(128.205.36.36) [UNBLOCK:SUCCESS]
[UNBLOCK:END]
```

AT SERVER

```
128.205.36.36:cClient(128.205.36.36) unblock(128.205.36.36)
```

[5.0] (buffer)

Grader screenshot:

Description:

```
[PA1-Client@CSE489/589]$ LOGIN 128.205.36.34 4000
[PA1-Client@CSE489/589]$ [RECEIVED:SUCCESS]
msg from:128.205.36.33
[msg]:hiiii
[RECEIVED:END]

[PA1-Client@CSE489/589]$ [LOGIN:SUCCESS]
[LOGIN:END]

[RELAYED:SUCCESS]
msg from:128.205.36.33, to:128.205.36.36
[msg]:hiiii
[RELAYED:END]
```

The server replies when a registration is successful with:

1. A list of all clients who are logged in right now. This list would be saved by the client for subsequent use and display.
2. All the buffered/stored messages for this client in the sequence in which the server received them. These messages will each result in a [EVENT]: Message Received In the event that a message (msg) with the following format string is received from a client with the IP address (client-ip):

("msg from:%s\n[msg]:%s\n", client-ip, msg)

[2.5] LOGOUT (logout)

Grader screenshot:

```
-- kajol@euston:grader -- ssh kajol@euston.cse.buffalo.edu
Grading for: refresh ...
5.0
[kajol@euston grader]$ ./grader.controller -c ./grader.cfg -s ../kajol_pal.tar -t logout
Reading configuration file: ./grader.cfg ...
Initializing grading servers ...

stones.cse.buffalo.edu
Uploading submission ...
  N Total  N Received  N Xferd  Average Speed  Time  Time  Time  Current
  Dload  Upload  Total  Spent  Left  Speed
100 597k  0  2 100 597k  1  546k  0:00:01  0:00:01  --:--:--  561k
OK
Building submission ...
OK
Starting grading server ...
OK

euston.cse.buffalo.edu
Uploading submission ...
  N Total  N Received  N Xferd  Average Speed  Time  Time  Time  Current
  Dload  Upload  Total  Spent  Left  Speed
100 597k  0  2 100 597k  1  549k  0:00:01  0:00:01  --:--:--  560k
OK
Building submission ...
OK
Starting grading server ...
OK

embankment.cse.buffalo.edu
Uploading submission ...
  N Total  N Received  N Xferd  Average Speed  Time  Time  Time  Current
  Dload  Upload  Total  Spent  Left  Speed
100 597k  0  2 100 597k  1  559k  0:00:01  0:00:01  --:--:--  561k
OK
Building submission ...
OK
Starting grading server ...
OK

underground.cse.buffalo.edu
Uploading submission ...
  N Total  N Received  N Xferd  Average Speed  Time  Time  Time  Current
  Dload  Upload  Total  Spent  Left  Speed
100 597k  0  2 100 597k  1  556k  0:00:01  0:00:01  --:--:--  558k
OK
Building submission ...
OK
Starting grading server ...
OK

highgate.cse.buffalo.edu
Uploading submission ...
  N Total  N Received  N Xferd  Average Speed  Time  Time  Time  Current
  Dload  Upload  Total  Spent  Left  Speed
100 597k  0  2 100 597k  1  559k  0:00:01  0:00:01  --:--:--  561k
OK
Building submission ...
OK
Starting grading server ...
OK

Grading for: logout ...
2.5
```

Description:

Will close the server session. However, application will not shut down and will keep accepting instructions like LOGIN, EXIT, IP, PORT, and AUTHOR. On LOGOUT, all client-related state is typically kept on both the client and the server.

- The statistical counter reset is not affixed by LOGOUT
- No clients blocked by this client are unblocked after LOGOUT.
- The blocked/unblocked state of this client on the server is not changed by LOGOUT.

AT CLIENT

```
[PA1-Client@CSE489/589]$ LOGOUT
[LOGOUT-SUCCESS]
[LOGOUT-END]

> OUTLINE  client status:0
> TIMELINE [PA1-Client@CSE489/589]$
```

AT SERVER

```
128.205.36.362$ LOGOUT
setting status:logged-out
```

[2.0] SEND Exception Handling (exception_send)

Grader screenshot:

```
-- kajol@euston-grader -- ssh kajol@euston.cse.buffalo.edu    -- kajol@underground-grader -- ssh kajol@underground.cse.buffalo.edu    -- kajol@highgate-grader -- ssh kajol@highgate.cse.buffalo.edu    ... +

FAILED
[kajol@euston-grader]$ ./grader_controller -c ./grader.cfg -s ../kajol_pai.tar -t exception_send
Reading configuration file: ./grader.cfg ...
Initializing grading servers ...

stones.cse.buffalo.edu
Uploading submission ...
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
             Dload  Upload   Total   Spent    Left   Speed
100 596k    0    2 100 596k      1   554k  0:00:01  0:00:01 --:--:--  555k
OK
Building submission ...
OK
Starting grading server ...
OK

euston.cse.buffalo.edu
Uploading submission ...
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
             Dload  Upload   Total   Spent    Left   Speed
100 596k    0    2 100 596k      1   556k  0:00:01  0:00:01 --:--:--  557k
OK
Building submission ...
OK
Starting grading server ...
OK

embankment.cse.buffalo.edu
Uploading submission ...
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
             Dload  Upload   Total   Spent    Left   Speed
100 596k    0    2 100 596k      1   553k  0:00:01  0:00:01 --:--:--  555k
OK
Building submission ...
OK
Starting grading server ...
OK

underground.cse.buffalo.edu
Uploading submission ...
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
             Dload  Upload   Total   Spent    Left   Speed
100 596k    0    2 100 596k      1   555k  0:00:01  0:00:01 --:--:--  557k
OK
Building submission ...
OK
Starting grading server ...
OK

highgate.cse.buffalo.edu
Uploading submission ...
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
             Dload  Upload   Total   Spent    Left   Speed
100 596k    0    2 100 596k      1   557k  0:00:01  0:00:01 --:--:--  559k
OK
Building submission ...
OK
Starting grading server ...
OK

Grading for: exception_send ...
2.0
[kajol@euston-grader]$
```

Description:

Handling of exceptions:

- Incorrect IP address
- Valid IP address that is absent from the local copy of the list of clients logged in

[2.0] BLOCK Exception Handling (exception_block)

Grader screenshot:

```
-- kajol@euston:grader -- ssh kajol@euston.cse.buffalo.edu    -- kajol@underground:grader -- ssh kajol@underground.cse.buffalo.edu    -- kajol@highgate:grader -- ssh kajol@highgate.cse.buffalo.edu    +

0.0
[kajol@euston grader]$ ./grader_controller -c ./grader.cfg -s ../kajol_pa1.tar -t exception_block
Reading configuration file: ./grader.cfg ...
Initializing grading servers ...

stones.cse.buffalo.edu
Uploading submission ...
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
Dload  Upload   Total   Spent    Left     Speed
100 597k    0    2 100 597k    1  559k  0:00:01  0:00:01 --:--:--  559k
OK
Building submission ...
OK
Starting grading server ...
OK

euston.cse.buffalo.edu
Uploading submission ...
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
Dload  Upload   Total   Spent    Left     Speed
100 597k    0    2 100 597k    1  557k  0:00:01  0:00:01 --:--:--  559k
OK
Building submission ...
OK
Starting grading server ...
OK

embankment.cse.buffalo.edu
Uploading submission ...
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
Dload  Upload   Total   Spent    Left     Speed
100 597k    0    2 100 597k    1  559k  0:00:01  0:00:01 --:--:--  560k
OK
Building submission ...
OK
Starting grading server ...
OK

underground.cse.buffalo.edu
Uploading submission ...
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
Dload  Upload   Total   Spent    Left     Speed
100 597k    0    2 100 597k    1  559k  0:00:01  0:00:01 --:--:--  561k
OK
Building submission ...
OK
Starting grading server ...
OK

highgate.cse.buffalo.edu
Uploading submission ...
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
Dload  Upload   Total   Spent    Left     Speed
100 597k    0    2 100 597k    1  557k  0:00:01  0:00:01 --:--:--  559k
OK
Building submission ...
OK
Starting grading server ...
OK

Grading for: exception_block ...
2.0
[kajol@euston grader]$ ./grader_controller -c ./grader.cfg -s ../kajol_pa1.tar -t exception_unblock
```

Description:

Handling of exceptions:

- Incorrect IP address
- Valid IP address that isn't on the local copy of the list of customers who are logged in
- Client with the following IP address has previously been denied access.

[2.0] BLOCKED Exception Handling (exception_blocked)

Grader screenshot:

```
-- kajol@euston-grader -- ssh kajol@euston.cse.buffalo.edu    -- kajol@underground-grader -- ssh kajol@underground.cse.buffalo.edu    -- kajol@highgate-grader -- ssh kajol@highgate.cse.buffalo.edu    +

0.5
[kajol@highgate-grader]$ ./grader_controller -c ./grader.cfg -s ../kajol_pal.tar -t exception_blocked
Reading configuration file: ./grader.cfg ...
Initializing grading servers ...

stones.cse.buffalo.edu
Uploading submission ...
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
             Dload  Upload   Total   Spent    Left   Speed
100 596k    0    2 100 596k      1  508k  0:00:01  0:00:01 --|--  510k
OK
Building submission ...
OK
Starting grading server ...
OK

euston.cse.buffalo.edu
Uploading submission ...
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
             Dload  Upload   Total   Spent    Left   Speed
100 596k    0    2 100 596k      1  553k  0:00:01  0:00:01 --|--  555k
OK
Building submission ...
OK
Starting grading server ...
OK

embankment.cse.buffalo.edu
Uploading submission ...
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
             Dload  Upload   Total   Spent    Left   Speed
100 596k    0    2 100 596k      1  555k  0:00:01  0:00:01 --|--  556k
OK
Building submission ...
OK
Starting grading server ...
OK

underground.cse.buffalo.edu
Uploading submission ...
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
             Dload  Upload   Total   Spent    Left   Speed
100 596k    0    2 100 596k      1  559k  0:00:01  0:00:01 --|--  560k
OK
Building submission ...
OK
Starting grading server ...
OK

highgate.cse.buffalo.edu
Uploading submission ...
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
             Dload  Upload   Total   Spent    Left   Speed
100 596k    0    2 100 596k      1  552k  0:00:01  0:00:01 --|--  553k
OK
Building submission ...
OK
Starting grading server ...
OK

Grading for: exception_blocked ...
2.0
[kajol@highgate-grader]$
```

Description:

Handling of exceptions:

- Improper IP address
- Valid IP address that is ineffective or nonexistent

[2.0] UNBLOCK Exception Handling (exception_unblock)

Grader screenshot:

```
-- kajol@euston-grader -- ssh kajol@euston.cse.buffalo.edu    -- kajol@underground-grader -- ssh kajol@underground.cse.buffalo.edu    -- kajol@highgate-grader -- ssh kajol@highgate.cse.buffalo.edu    ... +

failed to execute script grader_controller
[kajol@underground-grader]$ ./grader_controller -c ./grader.cfg -s ../kajol_pa1.tar -t exception_unblock
Reading configuration file: ./grader.cfg ...
Initializing grading servers ...

stones.cse.buffalo.edu
Uploading submission ...
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
Dload  Upload   Total   Spent    Left     Speed
100 596k    0    2 100 596k    1    556k  0:00:01  0:00:01 --:--:-- 557k
OK
Building submission ...
OK
Starting grading server ...
OK

euston.cse.buffalo.edu
Uploading submission ...
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
Dload  Upload   Total   Spent    Left     Speed
100 596k    0    2 100 596k    1    556k  0:00:01  0:00:01 --:--:-- 557k
OK
Building submission ...
OK
Starting grading server ...
OK

embankment.cse.buffalo.edu
Uploading submission ...
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
Dload  Upload   Total   Spent    Left     Speed
100 596k    0    2 100 596k    1    556k  0:00:01  0:00:01 --:--:-- 557k
OK
Building submission ...
OK
Starting grading server ...
OK

underground.cse.buffalo.edu
Uploading submission ...
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
Dload  Upload   Total   Spent    Left     Speed
100 596k    0    2 100 596k    1    558k  0:00:01  0:00:01 --:--:-- 559k
OK
Building submission ...
OK
Starting grading server ...
OK

highgate.cse.buffalo.edu
Uploading submission ...
% Total    % Received % Xferd  Average Speed   Time    Time     Time  Current
Dload  Upload   Total   Spent    Left     Speed
100 596k    0    2 100 596k    1    559k  0:00:01  0:00:01 --:--:-- 560k
OK
Building submission ...
OK
Starting grading server ...
OK

Grading for: exception_unblock ...
2.0
[kajol@underground-grader]$
```

Description:

Handling of exceptions:

- Incorrect IP address
- Valid IP address that isn't on the local copy of the list of customers who are logged in
- Not blocked is the client with the IP address "client-ip".

REFERENCES

- **struct Socket_Object**

https://github.com/jessefjxm/CSE589-Text-Chat-Application/blob/master/src/hwang58_assignment1.cpp

- **int_server_section**

https://github.com/tingting0711/CSE589_network_programming/blob/master/cse489589_assignment1/twang49/src/twang49_assignment1.cpp

- **PA1 Template**