### assignment2

#### Software Design:

1. Define the client and server classes that will handle the socket connections.
2. Define the messages that will be exchanged between the client and server.
3. Implement the LCR algorithm on the server.
4. Define the steps of the interaction process between the client and server, such as connection establishment, sending and receiving messages, and closing the connection.
5. Specify the number of nodes sent by the client to start the server LCR algorithm, and the server will simulate and send the simulation results
6. Design the server side to continuously listen for connections and serve multiple clients but sequentially, one after the other.
7. Increase the stability of the server, verify the parameters passed by the client, and ensure that the client's unexpected exit from the server is not affected and the log is printed.
8. Increase the ability of the client to proactively disconnect, detect unexpected server exit, and the client will automatically exit without blocking.

#### Software Testing:

##### test case:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Case Id | Test Case Description | Test Steps | Expected Results | Actual Results |
| 1 | Verify connect function | run server  run client | print message and log | same |
| 2 | Verify persistent connection | exit client | 1. server print log 2. listen other client | same |
| 3 | Verify simulation | client input node num | 1. server print simulation log 2. client receive result | same |
| 4 | Verify input illegality | client input not a number | 1. server use default number to simulate 2. client receive result | same |
| 5 | Verify exit | client input q or quit | 1. client exit 2. server print log and listen other client | same |
| 6 | Verify exception exit | client exception exit | 1. client exit 2. server print log and listen other client | same |
| 7 | Verify server exit | server exit | client print log and exit | same |

#### Conclusion:

1. Using Java sockets can establish a TCP connection between the server and client, and transmit information over the network.
2. Using loops can achieve continuous monitoring of connections on the server.
3. The client can trigger simulation deployed on the server side and receive simulation results.