

Lab report 1

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Files

1. Hello.java ---Election interface
2. Server.java ---Server program
3. Client.java ---Client program
4. candidates.txt ---Candidates name pool
5. VoteResult.ser ---Store voting result

Set up

1. cd C:\Users\surface\Documents\Java\election
2. javac -d . Hello.java Server.java Client.java
3. start rmiregistry
4. start java -classpath C:\Users\surface\Documents\Java\election -Djava.rmi.server.codebase=file:C:\Users\surface\Documents\Java\election Server
5. java -classpath C:\Users\surface\Documents\Java\election Client

Pipeline

1. After setting up
 - a) server side screenshot

```
Picked up _JAVA_OPTIONS: -Xmx512M
Server ready

-----
Candidates Pool:
1.Erfan Hosseini Sereshgi
2.Pan Fang
3.Joy Zhuge
4.Victor Bankston
5.Demi Qin
6.Henger Li
7.Chen Zheng
8.Zizhan Zheng
9.Siyang Hu
10. Joseph Allen
11. Avik Bhattacharya
12. Hanyu Lu
13. Andrea Martin Hernandez

-----
Current Voting Result:
{Erfan Hosseini Sereshgi=0, Pan Fang=0, Joy Zhuge=0, Victor Bankston=0, Demi Qin=0, Henger Li=0, Chen Zheng=0, Zizhan Zheng=0, Siyang Hu=0, Joseph Allen=0, Avik Bhattacharya=0, Hanyu Lu=0, Andrea Martin Hernandez=0}
```

- b) client side screenshot

```
C:\Users\surface\Documents\Java\election>java -classpath C:\Users\surface\Documents\Java\election Client
Picked up _JAVA_OPTIONS: -Xmx512M
response: Hello, Election!
Welcome to Vote System!
Please follow the three steps:
1. Register
2. Vote
3. Voting Results
0. Quit
-----
```

2. Register voter by a name to have a random 8-digit number

a) server side screenshot

```
Registered Voters:
jimmy:47133862
```

b) client side screenshot

```
-----
1
Please enter your name:jimmy
Your are registered with the id:
47133862
Please remember ID for voting
-----
Welcome to Vote System!
Please follow the three steps:
1. Register
2. Vote
3. Voting Results
0. Quit
-----
```

3. Verify voter's ID and vote

a) client side screenshot (checking if the ID is correct)

```
-----
2
Please Enter you VoterId:
12345678
The ID is wrong, please check again.
Please Enter you VoterId:
87654321
The ID is wrong, please check again.
Please Enter you VoterId:
47133862
The ID is correct, you can proceed to vote.
Here is Candidate List
1.Erfan Hosseini Sereshgi
2.Pan Fang
3.Joy Zhuge
4.Victor Bankston
5.Demi Qin
6.Henger Li
7.Chen Zheng
8.Zizhan Zheng
9.Siyang Hu
10.Joseph Allen
11.Avik Bhattacharya
12.Hanyu Lu
13.Andrea Martin Hernandez

Please Enter the name of the candiate that you would like make a vote:
1
Your vote has been submited, thank you for voting.
-----
```

b) client side screenshot (ensuring each ID votes only once) **requirement 1**

```
-----
2
Please Enter you VoterId:
47133862
The ID is correct, you can proceed to vote.
Here is Candidate List
1.Erfan Hosseini Sereshgi
2.Pan Fang
3.Joy Zhuge
4.Victor Bankston
5.Demi Qin
6.Henger Li
7.Chen Zheng
8.Zizhan Zheng
9.Siyang Hu
10.Joseph Allen
11.Avik Bhattacharya
12.Hanyu Lu
13.Andrea Martin Hernandez

Please Enter the name of the candidate that you would like make a vote:
2
The Voter ID has already voted, each ID can vote only once.
-----
```

4. Displaying result and store to file

a) server side screenshot (update with voting, ensure the voting records remain consistent when it is accessed concurrently by multiple clients) **requirement 2**

```
-----
Current Voting Result:
{Erfan Hosseini Sereshgi=1, Pan Fang=0, Joy Zhuge=0, Victor Bankston=0, Demi Qin=0, Henger Li=0, Chen Zheng=0, Zizhan Zheng=0, Siyang Hu=0, Joseph Allen=0, Avik Bhattacharya=0, Hanyu Lu=0, Andrea Martin Hernandez=0}
-----
```

b) client side screenshot

```
-----
3
The votes each of the candidates received are:
{Erfan Hosseini Sereshgi=1, Pan Fang=0, Joy Zhuge=0, Victor Bankston=0, Demi Qin=0, Henger Li=0, Chen Zheng=0, Zizhan Zheng=0, Siyang Hu=0, Joseph Allen=0, Avik Bhattacharya=0, Hanyu Lu=0, Andrea Martin Hernandez=0}
-----
```

c) server stores the result to file (all votes are safely stored even when the server process crashes) **requirement 3**

p.s. convert .ser to .txt, the file become unreadable code, see exiting problem for details.

```
sr java.util.HashMap 诶?? F
loadFactorI thresholdxp?@ w
t Erfan Hosseini Sereshgisr java.lang.Integer 鉅 芥 8 I valuextr
java.lang.Number 哟?
斷? xp t Pan Fangq ~ t Joy Zhugeq ~ t Victor Bankstonq ~ t
Demi Qinq ~ t Henger Liq ~ t
Chen Zhengq ~ t Zizhan Zhengq ~ t Siyang Huq ~ t Joseph Allenq ~
t Avik Bhattacharyaq ~ t Hanyu Luq ~ t Andrea Martin Hernandezq
```

5. Exit – client side screenshot

```
-----  
Welcome to Vote System!  
Please follow the three steps:  
1. Register  
2. Vote  
3. Voting Results  
0. Quit  
-----  
0  
Vote System Closed  
-----
```

Exist Problem

1. Used int ID and String candidate for the input of Vote function, didn't work after several trying with the following error. Using int ID and int candidateIndex for the Vote input instead.

Client exception: java.lang.NullPointerException

java.lang.NullPointerException

```
at Server.Vote(Server.java:95)  
at sun.reflect.NativeMethodAccessorImpl.invoke0(Native Method)  
at sun.reflect.NativeMethodAccessorImpl.invoke(Unknown Source)  
at sun.reflect.DelegatingMethodAccessorImpl.invoke(Unknown Source)  
at java.lang.reflect.Method.invoke(Unknown Source)  
at sun.rmi.server.UnicastServerRef.dispatch(Unknown Source)  
at sun.rmi.transport.Transport$1.run(Unknown Source)  
at sun.rmi.transport.Transport$1.run(Unknown Source)  
at java.security.AccessController.doPrivileged(Native Method)  
at sun.rmi.transport.Transport.serviceCall(Unknown Source)  
at sun.rmi.transport.tcp.TCPTransport.handleMessages(Unknown Source)  
at sun.rmi.transport.tcp.TCPTransport$ConnectionHandler.run0(Unknown Source)  
at sun.rmi.transport.tcp.TCPTransport$ConnectionHandler.lambda$run$0(Unknown Source)  
at java.security.AccessController.doPrivileged(Native Method)  
at sun.rmi.transport.tcp.TCPTransport$ConnectionHandler.run(Unknown Source)  
at java.util.concurrent.ThreadPoolExecutor.runWorker(Unknown Source)  
at java.util.concurrent.ThreadPoolExecutor$Worker.run(Unknown Source)  
at java.lang.Thread.run(Unknown Source)  
at sun.rmi.transport.StreamRemoteCall.exceptionReceivedFromServer(Unknown Source)  
at sun.rmi.transport.StreamRemoteCall.executeCall(Unknown Source)  
at sun.rmi.server.UnicastRef.invoke(Unknown Source)  
at java.rmi.server.RemoteObjectInvocationHandler.invokeRemoteMethod(Unknown Source)  
at java.rmi.server.RemoteObjectInvocationHandler.invoke(Unknown Source)  
at com.sun.proxy.$Proxy0.Vote(Unknown Source)  
at Client.main(Client.java:77)
```

2. Using FileOutputStream and ObjectOutputStream for writing HashMap to file, but the result is a bunch of unreadable code listed above, and the writing part should be also in the HashMap<String,Integer> results() function to keep update.

References

1. <https://stackoverflow.com/questions/12747946/how-to-write-and-read-a-file-with-a-hashmap>
2. <https://beginnersbook.com/2013/12/how-to-serialize-hashmap-in-java/>
3. <https://github.com/vbankov/java-rmi>
4. <https://github.com/kevinc/Leader-Election>
5. <https://github.com/VitaminDhruv/RMI-based-Election-process>
6. <https://github.com/pravaljain/Hirschberg-Sinclair-algorithm-for-leader-election-using-Java-RMI>
7. https://github.com/UjwalManjunath/Voting_System_Java_Rmi
8. <https://github.com/mohamedwahba/E-Voting-System-using-RMI>