

## **LAB-#3 -VECTOR CLOCKS**

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### **Requirements for running the assignment:**

jdk 1.8.0\_191 or above, IDE(Optional)(eclipse/NetBeans)

### **Running the assignment and the flow of GUI:**

1. Unzip the Reddammagari\_sxr6494.zip file
2. The folder Reddammagari\_sxr6494 inside has three files MessagingServer.java, MessagingClient.java, Message.java
3. If running on terminal cd to the folder and use the following commands:  
(First) javac MessagingServer.java(For Compilation); java MessagingServer(For Running)  
(Second) javac MessagingClient.java(For Compilation); java MessagingClient(For Running)
4. If running on IDE import the project then compile and run MessagingServer.java, MessagingClient.java
5. After running java MessagingServer GUI pops up then the server starts at "localhost:8080"
6. Server displays a log of usernames and currently connected clients
7. Stop server button is available for stopping the server and exiting out.
8. After running java MessagingClient.java GUI pops up asking users the server address to connect to(i.e enter localhost) and a distinct username(only A or B or C) from those to online users. If the same username is entered it prompts a dialog box saying "User Online" and username cannot be empty. If any other username than A or B or C is used it asks user to choose only A or B or C
9. Once a user registers with a server a dialog box pops up saying Welcome username and a log of usernames used since the server started.
10. Waits for all three clients to connect for exchange of vector clocks
11. Each client randomly chooses a recipient every 2 to 10 seconds and sends the recipient its vector clock and it is printed onto the sender's GUI along with recipient id.
12. The recipient after receiving a message updates its vector clock and prints it onto its GUI along with sender's id.
13. Server GUI displays the currently connected clients as well as messages exchanged between senders and recipients.
14. Exchange of vector clocks can be stopped by clicking on the stop button
15. User can exit and disconnect using the disconnect button. User will be removed from active clients/online clients.

### **Assumptions:**

1. There is no other process running or blocking port 8080
2. Can handle only three clients at a time
3. Server remains on indefinitely until disconnected
4. Users cannot send a vector clock to unintended recipients.
5. Messages are transferred between clients without losing them

6. Messages from each client are not sent to same recipient simultaneously.
7. All three clients are assumed to be connected throughout the execution. If a client disconnects
8. Vector clock algorithms runs only when all the three clients are connected

### **Known Bugs/Limitation:**

The program does not allow the case where the user tries to send vector clock to disconnected recipient or unintended recipient and receive an error message as the program restricts the user to choose only between online clients.

If one of the clients disconnects the program has to be restarted from beginning.

Messages from each client are not sent to the same recipient simultaneously if they do the vector clocks do not update correctly.

### **References:**

JPanel :

<https://www.geeksforgeeks.org/java-swing-jpanel-examples/>

Remove key events:

<https://stackoverflow.com/questions/4472530/disabling-space-bar-triggering-click-for-jbutton>

Setting the state of checkbox:

<http://www.java2s.com/Code/JavaAPI/javax.swing/JCheckBoxisSelected.htm>

Generate random number between a range:

<https://mkyong.com/java/java-generate-random-integers-in-a-range/>

TimerTask classes which you can use to schedule your task to run every n seconds.

<https://stackoverflow.com/questions/12908412/print-hello-world-every-x-seconds>

Selecting a random element from set

<https://www.javacodeexamples.com/get-random-elements-from-java-hashset-example/2765>

General References:

Multi-Threaded Chat Application

<https://www.geeksforgeeks.org/multi-threaded-chat-application-set-1/>

<https://www.geeksforgeeks.org/multi-threaded-chat-application-set-2/>