Practical No: 01

# Develop a JAVA program for multi-client chat server.

**ChatServer.java**

package multiclient;

import java.net.ServerSocket; import java.net.Socket;

public class ChatServer { int port;

ServerSocket serverSocket; Socket socket;

public ChatServer(int port) {

super(); this.port = port;

}

public void listen() { try {

serverSocket = new ServerSocket(port);

System.out.println("Listening on ip:" + serverSocket.getInetAddress().getHostAddress() + " and port:" + port);

while(true)

{

socket = serverSocket.accept(); System.out.println("Client Accepted " + socket); ServRequest sr=new ServRequest(socket,this); sr.start();

}

} catch (Exception e) {

System.out.println(e.getMessage());

}

}

public static void main(String[] args) {

// TODO Auto-generated method stub ChatServer cs = new ChatServer(5000); cs.listen();

}

}

# ChatClient.java

package multiclient;

import java.io.BufferedReader; import java.io.DataInputStream; import java.io.DataOutputStream; import java.io.InputStreamReader; import java.net.InetAddress; import java.net.Socket;

public class ChatClient {

Socket socket; int port;

public ChatClient(int port) { super();

this.port = port;

}

public void request() { try {

InetAddress host = InetAddress.getLocalHost(); socket = new Socket(host.getHostName(), port);

DataOutputStream dos = new DataOutputStream(socket.getOutputStream());

DataInputStream dis = new DataInputStream(socket.getInputStream()); System.out.println("Connected");

BufferedReader keyRead = new BufferedReader(new InputStreamReader(System.in));

String line = "";

while(!line.equals("bye")) {

line = keyRead.readLine(); dos.writeUTF(line);

dos.flush();

line = dis.readUTF(); System.out.println("Server reply - " + line);

}

keyRead.close(); dos.close(); socket.close();

}

catch(Exception e) { System.out.println(e.getMessage());

}

}

public static void main(String[] ar) { ChatClient cc = new ChatClient(5000); cc.request();

}

}

# ServRequest.java

package multiclient;

import java.io.BufferedInputStream; import java.io.BufferedOutputStream; import java.io.BufferedReader; import java.io.DataInputStream; import java.io.DataOutputStream; import java.io.InputStreamReader; import java.net.Socket;

public class ServRequest extends Thread{ private Socket socket; @SuppressWarnings("unused") private ChatServer chatServer;

public ServRequest(Socket socket, ChatServer chatServer) { this.socket=socket; this.chatServer=chatServer;

}

public void run()

{

try {

DataInputStream dis = new DataInputStream(new BufferedInputStream(socket.getInputStream()));

DataOutputStream dos = new DataOutputStream(new BufferedOutputStream(socket.getOutputStream()));

BufferedReader keyRead = new BufferedReader(new InputStreamReader(System.in));

boolean done = false;

while (!done) {

String line = dis.readUTF();

System.out.println(" Client Msg - "+ line + "\n"); done = line.equals("bye");

line = keyRead.readLine(); dos.writeUTF(line); dos.flush();

}

dis.close(); socket.close();

}

catch(Exception e)

{

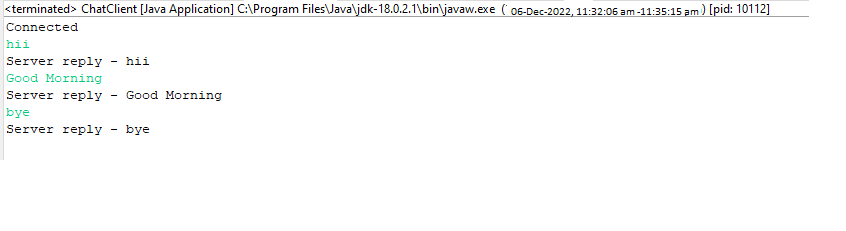
System.out.println(e.getMessage());

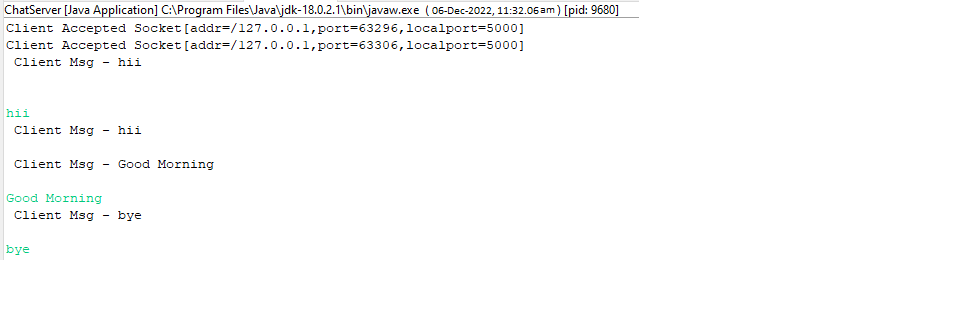
}

}

}

# Output:

****



1. **Write a java program to implement mutual exclusion using Token ring algorithm.**

# UDPChatClient2.java

package tokenring;

import java.io.BufferedReader; import java.io.InputStreamReader; import java.net.DatagramPacket; import java.net.DatagramSocket; import java.net.InetAddress;

public class UDPChatClient { DatagramSocket udpClientSocket;

int port;

public UDPChatClient(int port) { this.port = port;

}

public void sendReq() { InetAddress serverAddress;

String in;

try {

udpClientSocket = new DatagramSocket(); InetAddress host = InetAddress.getLocalHost();

serverAddress = InetAddress.getByName(host.getHostName());

BufferedReader keyRead = new BufferedReader(new InputStreamReader(System.in));

System.out.println("UDP Client-1 started at " + InetAddress.getLocalHost());

while (true) {

System.out.println("Enter message for server: "); in = keyRead.readLine();

DatagramPacket sndPacket = new DatagramPacket(in.getBytes(), in.getBytes().length, serverAddress, port);

udpClientSocket.send(sndPacket);

if(in.equalsIgnoreCase("bye")) break;

byte[] buf = new byte[1024];

DatagramPacket recPacket = new DatagramPacket(buf, buf.length); udpClientSocket.receive(recPacket);

String msg = new String(recPacket.getData()).trim();

System.out.println("Message from " + recPacket.getAddress().getHostAddress() + ": " + msg);

}

}

catch(Exception e) { System.out.println(e.getMessage());

}

finally {

udpClientSocket.close();

}

}

public static void main(String[] args) {

UDPChatClient sender = new UDPChatClient(5000); sender.sendReq();

}

}

# UDPChatSrv.java

package tokenring;

import java.io.BufferedReader; import java.io.InputStreamReader; import java.net.DatagramPacket; import java.net.DatagramSocket; import java.net.InetAddress;

public class UDPChatSrv {

public DatagramSocket udpSrvSocket; public int port;

String in;

public UDPChatSrv(int port) { this.port = port;

}

private void listen() { try {

udpSrvSocket = new DatagramSocket(port);

BufferedReader keyRead = new BufferedReader(new InputStreamReader(System.in));

String msg;

int [] clientPortA = new int[2]; InetAddress clientAddress; int clientPort, clientCnt = 0;

int tokenTo = -1, currentClient = -1; DatagramPacket recPacket, sndPacket;

System.out.println("Server started at " + InetAddress.getLocalHost());

while (true) {

byte[] buf = new byte[1024];

//System.out.println("while @server");

recPacket = new DatagramPacket(buf, buf.length);

// blocks until a packet is received udpSrvSocket.receive(recPacket);

msg = new String(recPacket.getData()).trim(); clientAddress = recPacket.getAddress(); clientPort = recPacket.getPort();

boolean clientPortPresent = false; int i;

for(i = 0; i < clientPortA.length; i++) { if(clientPortA[i] == clientPort) {

clientPortPresent = true; currentClient = i;

break;

}

}

if(clientPortPresent == false) { clientPortA[clientCnt] = clientPort; currentClient = clientCnt; clientCnt++;

}

//System.out.println("Message from client " + currentClient + ": " + msg);

if(tokenTo == -1 && clientCnt == 1) {

tokenTo = 0; //Assign token to 1st client in d list System.out.println("send Message :- Token assigned to client " +

currentClient);

in = "Token assigned";

sndPacket = new DatagramPacket(in.getBytes(), in.getBytes().length, clientAddress, clientPortA[currentClient]);

udpSrvSocket.send(sndPacket);

}

//1. token is with 0th client in d list => clientCnt=1

//2. client send message token => either he wants it or return it.

//3. if he wants check who has d token n reply accordingly

//3.1 if token is with 1 n 2 wants then deny

//3.2 token message arrived at server, current client n tokenTo are same

//3.2 so remove token from current n assign it to next

//4. if he returns it then assign it next in list

if(msg.contains("token")) { if(tokenTo == currentClient) {

if(clientPortA.length == tokenTo) tokenTo = 0;

else

tokenTo++;

currentClient);

System.out.println("send Message :- Token assigned to client " +

//in = keyRead.readLine();

in = "Token assigned";

sndPacket = new DatagramPacket(in.getBytes(), in.getBytes().length, clientAddress, clientPortA[tokenTo]);

udpSrvSocket.send(sndPacket);

}

else {

System.out.println("send Message :- ");

//in = keyRead.readLine();

in = "Token is with Client - " + tokenTo +". Wait for your turn."; sndPacket = new DatagramPacket(in.getBytes(), in.getBytes().length,

clientAddress, clientPortA[currentClient]);

udpSrvSocket.send(sndPacket);

}

}

else {

if(currentClient == tokenTo) { System.out.println("send Message :- "); in = keyRead.readLine();

//in = "Token assigned";

sndPacket = new DatagramPacket(in.getBytes(), in.getBytes().length, clientAddress, clientPortA[currentClient]);

}

else{

udpSrvSocket.send(sndPacket);

System.out.println("send Message :- ");

//in = keyRead.readLine();

in = "Token is with Client - " + tokenTo +". Wait for your turn."; sndPacket = new DatagramPacket(in.getBytes(), in.getBytes().length,

clientAddress, clientPortA[currentClient]);

udpSrvSocket.send(sndPacket);

}

}

/\*if(msg.equalsIgnoreCase("bye")) clientCnt--;

\*/

}

}

catch(Exception e) { System.out.println(e.getMessage());

}

finally {

}

}

udpSrvSocket.close();

public static void main(String[] args) {

UDPChatSrv client = new UDPChatSrv(5000); client.listen();

}

}

Output:

