Go Back N (Java)

/\*Server Program\*/

import java.net.\*;  
import java.io.\*;  
import java.util.\*;  
public class Server  
{  
public static void main(String args[]) throws Exception  
{  
ServerSocket server=new ServerSocket(6262);  
System.out.println(“Server established.”);  
Socket client=server.accept();  
ObjectOutputStream oos=new ObjectOutputStream(client.getOutputStream());  
ObjectInputStream ois=new ObjectInputStream(client.getInputStream());  
System.out.println(“Client is now connected.”);  
int x=(Integer)ois.readObject();  
int k=(Integer)ois.readObject();  
int j=0;  
int i=(Integer)ois.readObject();  
boolean flag=true;  
Random r=new Random(6);  
int mod=r.nextInt(6);  
while(mod==1||mod==0)  
mod=r.nextInt(6);  
while(true)  
{  
int c=k;  
for(int h=0;h<=x;h++)  
{  
System.out.print(“|”+c+”|”);  
c=(c+1)%x;  
}  
System.out.println();  
System.out.println();  
if(k==j)  
{  
System.out.println(“Frame “+k+” recieved”+”\n”+”Data:”+j);  
j++;  
System.out.println();  
}

else  
System.out.println(“Frames recieved not in correct order”+”\n”+” Expected farme:” + j +”\n”+ ” Recieved frame no :”+ k);  
System.out.println();  
if(j%mod==0 && flag)  
{  
System.out.println(“Error found. Acknowledgement not sent. “);  
flag=!flag;  
j–;  
}  
else if(k==j-1)  
{  
oos.writeObject(k);  
System.out.println(“Acknowledgement sent”);  
}  
System.out.println();  
if(j%mod==0)  
flag=!flag;  
k=(Integer)ois.readObject();  
if(k==-1)  
break;  
i=(Integer)ois.readObject();  
}  
System.out.println(“Client finished sending data. Exiting”);  
oos.writeObject(-1);  
}  
}

/\*Client Program\*/

import java.util.\*;  
import java.net.\*;  
import java.io.\*;  
public class Client  
{  
public static void main(String args[]) throws Exception  
{  
BufferedReader br=new BufferedReader(new InputStreamReader(System.in));  
System.out.print(“Enter the value of m : “);  
int m=Integer.parseInt(br.readLine());  
int x=(int)((Math.pow(2,m))-1);  
System.out.print(“Enter no. of frames to be sent:”);  
int count=Integer.parseInt(br.readLine());  
int data[]=new int[count];  
int h=0;  
for(int i=0;i<count;i++)  
{  
System.out.print(“Enter data for frame no ” +h+ ” => “);  
data[i]=Integer.parseInt(br.readLine());  
h=(h+1)%x;  
}  
Socket client=new Socket(“localhost”,6262);  
ObjectInputStream ois=new ObjectInputStream(client.getInputStream());  
ObjectOutputStream oos=new ObjectOutputStream(client.getOutputStream());  
System.out.println(“Connected with server.”);  
boolean flag=false;  
GoBackNListener listener=new GoBackNListener(ois,x);  
listener=new GoBackNListener(ois,x);  
listener.t.start();  
int strt=0;  
h=0;  
oos.writeObject(x);  
do  
{  
int c=h;  
for(int i=h;i<count;i++)  
{  
System.out.print(“|”+c+”|”);  
c=(c+1)%x;  
}  
System.out.println();  
System.out.println();  
h=strt;  
for(int i=strt;i<x;i++)  
{  
System.out.println(“Sending frame:”+h);  
h=(h+1)%x;  
System.out.println();  
oos.writeObject(i);  
oos.writeObject(data[i]);  
Thread.sleep(100);  
}  
listener.t.join(3500);  
if(listener.reply!=x-1)  
{  
System.out.println(“No reply from server in 3.5 seconds. Resending data from frame no ” + (listener.reply+1));  
System.out.println();  
strt=listener.reply+1;  
flag=false;  
}  
else  
{  
System.out.println(“All elements sent successfully. Exiting”);  
flag=true;  
}  
}while(!flag);  
oos.writeObject(-1);  
}  
}

class GoBackNListener implements Runnable  
{  
Thread t;  
ObjectInputStream ois;  
int reply,x;  
GoBackNListener(ObjectInputStream o,int i)  
{  
t=new Thread(this);  
ois=o;  
reply=-2;  
x=i;  
}  
@Override  
public void run() {  
try  
{  
int temp=0;  
while(reply!=-1)  
{  
reply=(Integer)ois.readObject();  
if(reply!=-1 && reply!=temp+1)  
reply=temp;  
if(reply!=-1)  
{  
temp=reply;  
System.out.println(“Acknowledgement of frame no ” + (reply%x) + ” recieved.”);  
System.out.println();  
}  
}  
reply=temp;  
}  
catch(Exception e)  
{  
System.out.println(“Exception => ” + e);  
}  
}  
}

/\*Client Output

Enter the value of m : 7  
Enter no. of frames to be sent:5  
Enter data for frame no 0 => 1  
Enter data for frame no 1 => 2  
Enter data for frame no 2 => 3  
Enter data for frame no 3 => 4  
Enter data for frame no 4 => 5  
Connected with server.  
|0||1||2||3||4|

Sending frame:0

Acknowledgement of frame no 0 recieved.

Sending frame:1

Sending frame:2

Sending frame:3

Sending frame:4

Sending frame:5  
\*/

/\*Server Output

Server established.  
Client is now connected.  
|0||1||2||3||4||5||6||7||8||9||10||11||12||13||14||15||16||17||18||19||20||21||22||23||24||25||26||27||28||29||30||31||32||33||34||35||36||37||38||39||40||41||42||43||44||45||46||47||48||49||50||51||52||53||54||55||56||57||58||59||60||61||62||63||64||65||66||67||68||69||70||71||72||73||74||75||76||77||78||79||80||81||82||83||84||85||86||87||88||89||90||91||92||93||94||95||96||97||98||99||100||101||102||103||104||105||106||107||108||109||110||111||112||113||114||115||116||117||118||119||120||121||122||123||124||125||126||0|

Frame 0 recieved  
Data:0  
Acknowledgement sent

|1||2||3||4||5||6||7||8||9||10||11||12||13||14||15||16||17||18||19||20||21||22||23||24||25||26||27||28||29||30||31||32||33||34||35||36||37||38||39||40||41||42||43||44||45||46||47||48||49||50||51||52||53||54||55||56||57||58||59||60||61||62||63||64||65||66||67||68||69||70||71||72||73||74||75||76||77||78||79||80||81||82||83||84||85||86||87||88||89||90||91||92||93||94||95||96||97||98||99||100||101||102||103||104||105||106||107||108||109||110||111||112||113||114||115||116||117||118||119||120||121||122||123||124||125||126||0||1|

Frame 1 recieved  
Data:1  
Error found. Acknowledgement not sent.

|2||3||4||5||6||7||8||9||10||11||12||13||14||15||16||17||18||19||20||21||22||23||24||25||26||27||28||29||30||31||32||33||34||35||36||37||38||39||40||41||42||43||44||45||46||47||48||49||50||51||52||53||54||55||56||57||58||59||60||61||62||63||64||65||66||67||68||69||70||71||72||73||74||75||76||77||78||79||80||81||82||83||84||85||86||87||88||89||90||91||92||93||94||95||96||97||98||99||100||101||102||103||104||105||106||107||108||109||110||111||112||113||114||115||116||117||118||119||120||121||122||123||124||125||126||0||1||2|

Frames recieved not in correct order  
Expected farme:1  
Recieved frame no :2  
|3||4||5||6||7||8||9||10||11||12||13||14||15||16||17||18||19||20||21||22||23||24||25||26||27||28||29||30||31||32||33||34||35||36||37||38||39||40||41||42||43||44||45||46||47||48||49||50||51||52||53||54||55||56||57||58||59||60||61||62||63||64||65||66||67||68||69||70||71||72||73||74||75||76||77||78||79||80||81||82||83||84||85||86||87||88||89||90||91||92||93||94||95||96||97||98||99||100||101||102||103||104||105||106||107||108||109||110||111||112||113||114||115||116||117||118||119||120||121||122||123||124||125||126||0||1||2||3|

Frames recieved not in correct order  
Expected farme:1  
Recieved frame no :3  
|4||5||6||7||8||9||10||11||12||13||14||15||16||17||18||19||20||21||22||23||24||25||26||27||28||29||30||31||32||33||34||35||36||37||38||39||40||41||42||43||44||45||46||47||48||49||50||51||52||53||54||55||56||57||58||59||60||61||62||63||64||65||66||67||68||69||70||71||72||73||74||75||76||77||78||79||80||81||82||83||84||85||86||87||88||89||90||91||92||93||94||95||96||97||98||99||100||101||102||103||104||105||106||107||108||109||110||111||112||113||114||115||116||117||118||119||120||121||122||123||124||125||126||0||1||2||3||4|

Frames recieved not in correct order  
Expected farme:1  
Recieved frame no :4  
\*/