**testserver.java :-**

import java.io.\*;

import java.net.\*;

import java.util.\*;

class testserver

{

public static void main(String args[])throws IOException

{

System.out.println("...........Server..........");

System.out.println("Waiting for connection....");

InetAddress addr=InetAddress.getByName("Localhost");

ServerSocket ss=new ServerSocket(500);

Socket client=new Socket();

client=ss.accept();

BufferedInputStream in=new BufferedInputStream(client.getInputStream());

DataOutputStream out=new DataOutputStream(client.getOutputStream());

System.out.println("Received request for sending frames");

int p=in.read();

boolean f[]=new boolean[p];

int pc=in.read();

System.out.println("Sending....");

if(pc==0)

{

for(int i=0;i<p;++i)

{

System.out.println("sending frame number "+i);

out.write(i);

out.flush();

System.out.println("Waiting for acknowledgement");

try

{

Thread.sleep(7000);

}

catch(Exception e){}

int a=in.read();

System.out.println("received acknowledgement for frame "+i+" as "+a);

}

out.flush();

}

else

{

for(int i=0;i<p;++i)

{

if(i==2)

{

System.out.println("sending frame no "+i);

}

else

{

System.out.println("sending frame no "+i);

out.write(i);

out.flush();

System.out.println("Waiting for acknowledgement ");

try

{

Thread.sleep(7000);

}

catch(Exception e){}

int a=in.read();

if(a!=255)

{

System.out.println("received ack for frame no: "+i+" as "+a);

f[i]=true;

}

}// end of inner else

}// end of for

// check which frames have not been ack

for(int a=0;a<p;++a)

{

if(f[a]==false)

{

System.out.println("Resending frame "+a);

out.write(a);

out.flush();

System.out.println("Waiting for ack ");

try

{

Thread.sleep(5000);

}

catch(Exception e){}

int b=in.read();

System.out.println("received ack for frame no: "+a+" as "+b);

f[a]=true;

}

}

out.flush();

}// end of else which is for error

in.close();

out.close();

client.close();

ss.close();

System.out.println("Quiting");

}// end main method

}// end main class

**testclient.java :-**

import java.io.\*;

import java.net.\*;

import java.math.\*;

import java.util.\*;

class testclient

{

public static void main(String args[])throws IOException

{

InetAddress addr=InetAddress.getByName("Localhost");

System.out.println(addr);

Socket connection=new Socket(addr,500);

BufferedInputStream in=new BufferedInputStream(connection.getInputStream());

DataOutputStream out=new DataOutputStream(connection.getOutputStream());

Scanner scr=new Scanner(System.in);// this will be used to accept i/p from console

System.out.println(".......Client........");

System.out.println("Connect");

System.out.println("Enter the number of frames to be requested to the server");

int c=scr.nextInt();

out.write(c);

out.flush();

System.out.println("Enter the type of trans. Error=1 ; No Error=0");

int choice=scr.nextInt();

out.write(choice);

int check=0;

int i=0;

int j=0;

if(choice==0)

{

for(j=0;j<c;++j)

{

i=in.read();

System.out.println("received frame no: "+i);

System.out.println("Sending acknowledgement for frame no: "+i);

out.write(i);

out.flush();

}

out.flush();

}

else

{

for(j=0;j<c;++j)

{

i=in.read();

if(i==check)

{

System.out.println("received frame no: "+i);

System.out.println("Sending acknowledgement for frame no: "+i);

out.write(i);

++check;

}

else

{

--j;

System.out.println("Discarded frame no: "+i);

System.out.println("Sending NEGATIVE ack");

out.write(-1);

}

out.flush();

}

}//end of else for error

in.close();

out.close();

System.out.println("Quiting");

}// end of main method

}// end of main class

**Server Output :-**

...........Server..........

Waiting for connection....

Received request for sending frames

Sending....

sending frame no 0

Waiting for acknowledgement

received ack for frame no: 0 as 0

sending frame no 1

Waiting for acknowledgement

received ack for frame no: 1 as 1

sending frame no 2

sending frame no 3

Waiting for acknowledgement

sending frame no 4

Waiting for acknowledgement

Resending frame 2

Waiting for ack

received ack for frame no: 2 as 2

Resending frame 3

Waiting for ack

received ack for frame no: 3 as 3

Resending frame 4

Waiting for ack

received ack for frame no: 4 as 4

Quiting

**Client Output :-**

D:\CN Lab\CN Final\Sliding Window\Go Back N>java testclient

Localhost/127.0.0.1

.......Client........

Connect

Enter the number of frames to be requested to the server

5

Enter the type of trans. Error=1 ; No Error=0

1

received frame no: 0

Sending acknowledgement for frame no: 0

received frame no: 1

Sending acknowledgement for frame no: 1

Discarded frame no: 3

Sending NEGATIVE ack

Discarded frame no: 4

Sending NEGATIVE ack

received frame no: 2

Sending acknowledgement for frame no: 2

received frame no: 3

Sending acknowledgement for frame no: 3

received frame no: 4

Sending acknowledgement for frame no: 4

Quiting