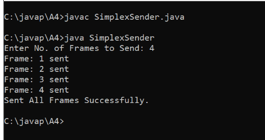
DCN

Assignment - 4

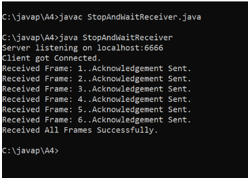
3152

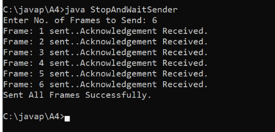
Hardik Togadiya

Question 1:- Write a java program to perform the implementation of Simplex Protocol  
//SimplexReceiver……….  
  
import java.util.\***;** import java.net.\***;** import java.io.\***;**class SimplexReceiver{  
  
 public static void main(String[] args)  
  
 {  
  
 try  
  
 {  
  
 ServerSocket sk = new ServerSocket(6666)**;** System.*out*.println("Server listening on localhost:6666")**;** Socket s = sk.accept()**;** System.*out*.println("Client got Connected.")**;** DataInputStream is = new DataInputStream(s.getInputStream())**;** int frameno = 0**;** while(true)  
 {  
  
 String temp = is.readUTF()**;** frameno++**;** temp.trim()**;** String data[] = temp.split(" ")**;** int totalframes = Integer.*parseInt*(data[1])**;** System.*out*.println("Received Frame: "+ frameno)**;** if(frameno == totalframes)  
  
 {  
  
 System.*out*.println("Received All Frames Successfully.")**;** break**;** }  
  
  
  
  
  
 }  
  
 is.close()**;** s.close()**;** sk.close()**;** }  
  
 catch(Exception e)  
  
 {  
  
 System.*out*.println(e)**;** }  
  
 }  
  
}  
  
  
  
//SimplexSender…………  
  
import java.util.\***;** import java.net.\***;** import java.io.\***;**class SimplexSender{  
  
 public static void main(String[] args)  
  
 {  
  
 try  
  
 {  
  
 Socket s = new Socket("localhost"**,**6666)**;** DataOutputStream os = new DataOutputStream(s.getOutputStream())**;** Scanner sc = new Scanner(System.*in*)**;** System.*out*.print("Enter No. of Frames to Send: ")**;** int totalframes = sc.nextInt()**;** for(int i=1**;**i<=totalframes**;**i++)  
  
 {  
  
 String frame = i + " " + totalframes**;** os.writeUTF(frame)**;** os.flush()**;** System.*out*.println("Frame: "+ i + " sent")**;** Thread.*sleep*(1000)**;** }  
  
  
  
 System.*out*.println("Sent All Frames Successfully.")**;** os.close()**;** s.close()**;** }  
  
 catch(Exception e)  
  
 {  
  
 System.*out*.println(e)**;** }  
  
 }  
  
}

  
  
  
  
Question:-2 Write a java program to perform the implementation of Stop & Wait Protocol.

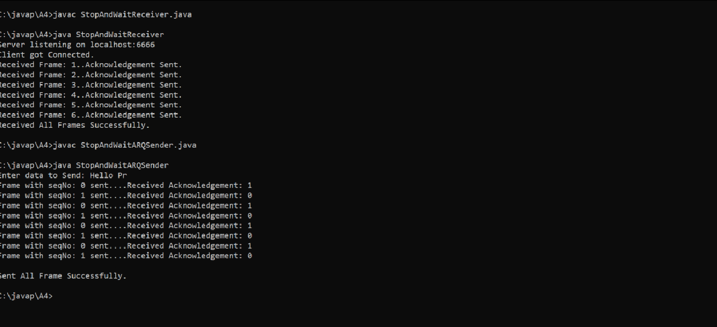
// StopAndWaitReceiver……. import java.util.\*;  
import java.net.\***;** import java.io.\***;**class StopAndWaitReceiver{  
  
 public static void main(String[] args)  
  
 {  
  
 try  
  
 {  
  
 ServerSocket sk = new ServerSocket(6666)**;** System.*out*.println("Server listening on localhost:6666")**;** Socket s = sk.accept()**;** System.*out*.println("Client got Connected.")**;** DataInputStream is = new DataInputStream(s.getInputStream())**;** DataOutputStream os = new DataOutputStream(s.getOutputStream())**;** int frameno = 0**;** while(true)  
 {  
  
 String temp = is.readUTF()**;** frameno++**;** temp.trim()**;** String data[] = temp.split(" ")**;** int totalframes = Integer.*parseInt*(data[1])**;** System.*out*.print("Received Frame: "+ frameno)**;** Thread.*sleep*(1000)**;** os.writeUTF("Ack")**;** os.flush()**;** System.*out*.println("..Acknowledgement Sent.")**;** if(frameno == totalframes)  
  
 {  
  
 System.*out*.println("Received All Frames Successfully.")**;** break**;** }  
  
  
  
  
  
 }  
  
 is.close()**;** s.close()**;** sk.close()**;** }  
  
 catch(Exception e)  
  
 {  
  
 System.*out*.println(e)**;** }  
  
 }  
  
}  
  
// StopAndWaitSender……….  
  
import java.util.\***;** import java.net.\***;** import java.io.\***;**class StopAndWaitSender{  
  
 public static void main(String[] args)  
  
 {  
  
 try  
  
 {  
  
 Socket s = new Socket("localhost"**,**6666)**;** DataOutputStream os = new DataOutputStream(s.getOutputStream())**;** DataInputStream is = new DataInputStream(s.getInputStream())**;** Scanner sc = new Scanner(System.*in*)**;** System.*out*.print("Enter No. of Frames to Send: ")**;** int totalframes = sc.nextInt()**;** for(int i=1**;**i<=totalframes**;**)  
  
 {  
  
 String frame = i + " " + totalframes**;** os.writeUTF(frame)**;** os.flush()**;** System.*out*.print("Frame: "+ i + " sent")**;** String ack = is.readUTF()**;** if(ack!=null)  
  
 {  
  
 System.*out*.print("..Acknowledgement Received.")**;** System.*out*.println("")**;** i++**;** }  
  
 else  
  
 {  
  
 System.*out*.println("..Acknowledgement Not Received for  
 Frame: "+ i);  
  
 System.*exit*(0)**;** }  
  
  
  
 Thread.*sleep*(1000)**;** }  
  
  
  
 System.*out*.println("Sent All Frames Successfully.")**;** os.close()**;** s.close()**;** }  
  
 catch(Exception e)  
  
 {  
  
 System.*out*.println(e)**;** }  
  
 }  
  
}

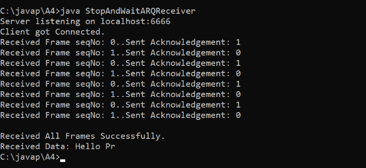




Question:-3 Write a java program to perform the implementation of Stop & Wait ARQ Protocol.

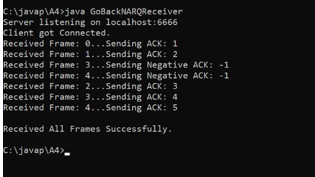
// StopAndWaitARQReceiver……  
  
import java.util.\***;** import java.net.\***;** import java.io.\***;**class StopAndWaitARQReceiver{  
  
 public static void main(String[] args)  
  
 {  
  
 try  
  
 {  
  
 ServerSocket sk = new ServerSocket(6666)**;** System.*out*.println("Server listening on localhost:6666")**;** Socket s = sk.accept()**;** System.*out*.println("Client got Connected.")**;** DataInputStream is = new DataInputStream(s.getInputStream())**;** DataOutputStream os = new DataOutputStream(s.getOutputStream())**;** String data = new String()**;** int ack = 0**,**flag = 0**;** while(true)  
  
 {  
  
 String temp = is.readUTF()**;** if(temp.equals("FIN"))  
  
 {  
  
 System.*out*.println("\nReceived All Frames Successfully.")**;** System.*out*.print("Received Data: "+ data)**;** break**;** }  
  
  
  
 int seqno =Integer.*valueOf*(temp.substring(0**,**1))**;** System.*out*.print("Received Frame seqNo: "+ seqno)**;** Thread.*sleep*(1000)**;** if(seqno == ack)  
  
 {  
  
 ack = (seqno==0)?1:0**;** data = data + temp.substring(1**,**2)**;** }  
  
 else  
  
 {  
  
 System.*out*.println(". Duplicate Frames Received.")**;** }  
  
  
  
//intentionally send false ack  
  
/\*if(seqno==1 && flag==0)  
  
{  
  
os.writeInt(seqno); flag=1;  
continue;  
   
}\*/  
  
  
  
 os.writeInt(ack)**;** os.flush()**;** System.*out*.println("..Sent Acknowledgement: "+ ack)**;** }  
  
 is.close()**;** os.close()**;** s.close()**;** sk.close()**;** }  
  
 catch(Exception e)  
  
 {  
  
 System.*out*.println(e)**;** }  
  
 }  
  
}  
  
  
  
// StopAndWaitARQSender……. import java.util.\*;  
import java.net.\***;** import java.io.\***;**class StopAndWaitARQSender{  
  
 public static void main(String[] args)  
  
 {  
  
 try  
  
 {  
  
 Socket s = new Socket("localhost"**,**6666)**;** DataOutputStream os = new DataOutputStream(s.getOutputStream())**;** DataInputStream is = new DataInputStream(s.getInputStream())**;** Scanner sc = new Scanner(System.*in*)**;** System.*out*.print("Enter data to Send: ")**;** String data = sc.nextLine()**;** int totalframes = data.length()**;** int seqno = 0**,**flag = 0**;** for(int i=0**;**i<totalframes**;**)  
  
 {  
  
 String frame = seqno + data.substring(i**,**i+1)**;** os.writeUTF(frame)**;** os.flush()**;** System.*out*.print("Frame with seqNo: "+ seqno + " sent..")**;** int aack = (seqno==0)?1:0**;** int rack = is.readInt()**;** if(rack == aack)  
  
 {  
  
 System.*out*.println("..Received Acknowledgement: "+ rack)**;** seqno = (seqno==0)?1:0**;** i++**;** }  
  
 else  
  
 {  
  
 System.*out*.println("..Acknowledgement Not- Received/Currupted for Frame with seqNo: "+ seqno)**;** System.*out*.println("Resending ther Frame.")**;** }  
  
  
  
 Thread.*sleep*(1000)**;**//intentionally resend the frame  
  
/\*if(i==3 && flag==0)  
  
{  
  
seqno = (seqno==0)?1:0; i--;  
flag=1;  
  
}\*/  
  
 }  
  
 os.writeUTF("FIN")**;** os.flush()**;** System.*out*.println("\nSent All Frame Successfully.")**;** os.close()**;** is.close()**;** s.close()**;** }  
  
 catch(Exception e)  
  
 {  
  
 System.*out*.println(e)**;** }  
  
 }  
  
}

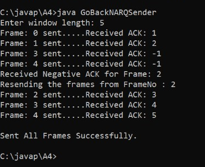




Question:-4 Write a java program to perform the implementation of Go Back N ARQ Protocol.

// GoBackNARQReceiver……..  
  
import java.util.\***;** import java.net.\***;** import java.io.\***;**class GoBackNARQReceiver{  
  
 public static void main(String[] args)  
  
 {  
  
 try  
  
 {  
  
 ServerSocket sk = new ServerSocket(6666)**;** System.*out*.println("Server listening on localhost:6666")**;** Socket s = sk.accept()**;** System.*out*.println("Client got Connected.")**;** DataInputStream is = new DataInputStream(s.getInputStream())**;** DataOutputStream os = new DataOutputStream(s.getOutputStream())**;** int counter = 0**;** while(true)  
  
 {  
  
 int rframe = is.readInt()**;** if(rframe == -1)  
  
 {  
  
 System.*out*.println("\nReceived All Frames Successfully.")**;** break**;** }  
  
  
  
 System.*out*.print("Received Frame: "+ rframe)**;** Thread.*sleep*(1000)**;** if(rframe == counter)  
  
 {  
  
 int ack = counter +1**;** System.*out*.println("...Sending ACK: "+ack)**;** os.writeInt(ack)**;** counter++**;** }  
  
 else  
  
 {  
  
 System.*out*.println("...Sending Negative ACK: -1")**;** os.writeInt(-1)**;** }  
  
  
  
  
  
 }  
  
 os.close()**;** is.close()**;** s.close()**;** sk.close()**;** }  
  
 catch(Exception e)  
  
 {  
  
 System.*out*.println(e)**;** }  
  
 }  
  
}  
  
//GoBackNARQSender……….  
  
import java.util.\***;** import java.net.\***;** import java.io.\***;**class GoBackNARQSender{  
  
 public static void main(String[] args)  
  
 {  
  
 try  
  
 {  
  
 Socket s = new Socket("localhost"**,**6666)**;** DataOutputStream os = new DataOutputStream(s.getOutputStream())**;** DataInputStream is = new DataInputStream(s.getInputStream())**;** Scanner sc = new Scanner(System.*in*)**;** System.*out*.print("Enter window length: ")**;** int wlen = sc.nextInt()**;** int ack[] = new int[wlen]**;** int i=0**,**flag=0**;** for(**;** i<wlen**;** i++)  
  
 {  
  
//intentionally skip one frame if(i==2 && flag==0)  
 {  
  
 flag=1**;** continue**;** }  
  
  
  
 os.writeInt(i)**;** os.flush()**;** System.*out*.print("Frame: "+ i + " sent...")**;** ack[i] = is.readInt()**;** System.*out*.println("..Received ACK: "+ack[i])**;** Thread.*sleep*(1000)**;** if(i == wlen-1)  
  
 {  
  
 for(int a=0**;**a<wlen**;**a++)  
  
 {  
  
 if(ack[a]!=a+1)  
  
 {  
  
 System.*out*.println("Received Negative ACK for Frame: " + a + "\nResending the frames from FrameNo : "+ a)**;** i=a-1**;** Thread.*sleep*(1000)**;** break**;** }  
  
 }  
  
 }  
  
 }  
  
  
  
 os.writeInt(-1)**;** os.flush()**;** os.close()**;** is.close()**;** s.close()**;** }  
  
 catch(Exception e)  
  
 {  
  
 System.*out*.println(e)**;** }  
  
 }  
  
}





Question:-5 Write a java program to perform the implementation of Selective Repeat Protocol.

//SelectiveRepetARQReceiver……..  
  
import java.util.\***;** import java.net.\***;** import java.io.\***;**class SelectiveRepetARQReceiver{  
  
 public static void main(String[] args)  
  
 {  
  
 try  
  
 {  
  
 ServerSocket sk = new ServerSocket(6666)**;** System.*out*.println("Server listening on localhost:6666")**;** Socket s = sk.accept()**;** System.*out*.println("Client got Connected.")**;** DataInputStream is = new DataInputStream(s.getInputStream())**;** DataOutputStream os = new DataOutputStream(s.getOutputStream())**;** int counter = 0**;** int missingFrame[] = new int[10]**;** int a=0**;** while(true)  
  
 {  
  
 int flag=0**;** int rframe = is.readInt()**;** if(rframe == -1)  
 {  
  
 System.*out*.println("\nReceived All Frames Successfully.")**;** break**;** }  
  
  
  
 System.*out*.print("Received Frame: "+ rframe)**;** Thread.*sleep*(1000)**;** if(rframe == counter)  
  
 {  
  
 int ack = counter +1**;** System.*out*.println("...Sending ACK: "+ack)**;** os.writeInt(ack)**;** counter++**;** }  
  
 else  
  
 {  
  
 for(int j=0**;**j<10**;**j++)  
  
 {  
  
 if(rframe == missingFrame[j])  
  
 {  
  
 int ack = rframe +1**;** System.*out*.println("...Sending ACK: "+ack)**;** os.writeInt(ack)**;** flag=1**;** }  
  
 }  
  
  
 if(flag==0)  
  
 {  
  
 System.*out*.println("...Sending Negative ACK: -1")**;** os.writeInt(-1)**;** missingFrame[a] = counter**;** a++**;** counter++**;** }  
  
 }  
  
  
  
 }  
  
  
  
 os.close()**;** is.close()**;** s.close()**;** sk.close()**;** }  
  
 catch(Exception e)  
  
 {  
  
 System.*out*.println(e)**;** }  
  
 }  
  
}  
  
// SelectiveRepetARQSender………..  
  
  
  
import java.util.\***;** import java.net.\***;** import java.io.\***;**class SelectiveRepetARQSender{  
  
 public static void main(String[] args)  
  
 {  
  
 try  
  
 {  
  
 Socket s = new Socket("localhost"**,**6666)**;** DataOutputStream os = new DataOutputStream(s.getOutputStream())**;** DataInputStream is = new DataInputStream(s.getInputStream())**;** Scanner sc = new Scanner(System.*in*)**;** System.*out*.print("Enter window length: ")**;** int wlen = sc.nextInt()**;** int ack[] = new int[wlen]**;** int i=0**,**flag=0**;** for(**;** i<wlen**;** i++)  
  
 {  
  
//intentionally skip one frame if(i==2 && flag==0)  
 {  
  
 flag=1**;** continue**;** }  
  
 os.writeInt(i)**;** os.flush()**;** System.*out*.print("Frame: "+ i + " sent...")**;** ack[i] = is.readInt()**;** System.*out*.println("..Received ACK: "+ack[i])**;** Thread.*sleep*(1000)**;** if(i == wlen-1)  
  
 {  
  
 for(int a=0**;**a<wlen**;**a++)  
  
 {  
  
 if(ack[a]!=a+1)  
  
 {  
  
 System.*out*.println("Received Negative ACK for Frame: " + a + "\nResending the frames from FrameNo : "+ a)**;** Thread.*sleep*(1000)**;** os.writeInt(a)**;** os.flush()**;** System.*out*.print("Frame: "+ i + " sent...")**;** ack[a]=is.readInt()**;** System.*out*.println("..Received ACK:  
 "+ack[a]);  
  
  
  
 a--**;** }  
  
 }  
  
 }  
  
 }  
  
  
  
 os.writeInt(-1)**;** os.flush()**;** System.*out*.println("\nSent All Frames Successfully.")**;** os.close()**;** is.close()**;** s.close()**;** }  
  
 catch(Exception e)  
  
 {  
  
 System.*out*.println(e)**;** }  
  
 }

