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## Lab7 Selective Repeat ARQ

### Server :

```
import java.io.DataInputStream;
import java.io.DataOutputStream;
import java.io.IOException;
import java.net.ServerSocket;
import java.net.Socket;
import java.net.SocketException;
import java.util.Scanner;
import java.util.*;
import java.io.*;
import java.lang.Math;

public class arqserver
{
    static ServerSocket Serversocket;
    static DataInputStream dis;
    static DataOutputStream dos;

    public static void main(String[] args) throws SocketException
    {
        try
        {
            int m;
            Scanner obj = new Scanner(System.in);
            System.out.println("enter value of m :");
            m = obj.nextInt();
            int size = (int)Math.pow(2,(m-1));
            System.out.println("Window size is = "+size);
            System.out.println("enter elements :");
            int [] a = new int[size];
            for(int i = 0;i<size;i++){
                a[i] = obj.nextInt();
            }
            Serversocket = new ServerSocket(8011);
            System.out.println("waiting for connection");
            Socket client = Serversocket.accept();
            dis = new DataInputStream(client.getInputStream());
            dos = new DataOutputStream(client.getOutputStream());
        }
    }
}
```

```
        System.out.println("The number of packets sent is:" +
a.length);
        int y = a.length;
        dos.write(y);
        dos.flush();

        for (int i = 0; i < a.length; i++)
        {
            dos.write(a[i]);
            dos.flush();
        }

        int k = dis.read();

        dos.write(a[k]);
        dos.flush();

    }
    catch (IOException e)
    {
        System.out.println(e);
    }
    finally
    {
        try
        {
            dis.close();
            dos.close();
        }
        catch (IOException e)
        {
            e.printStackTrace();
        }
    }
}
```

## Client :

```
import java.lang.System;
import java.net.*;
import java.text.*;
import java.util.Random;
import java.util.*;
import java.io.*;

public class arqclient {
    static Socket connection;

    public static void main(String a[]) throws SocketException {
        try {
            int v[] = new int[10];
            int n = 0;
            Random rand = new Random();
            int rand = 0;

            InetAddress addr = InetAddress.getByName("Localhost");
            System.out.println(addr);
            connection = new Socket(addr, 8011);
            DataOutputStream out = new
DataOutputStream(connection.getOutputStream());
            DataInputStream in = new
DataInputStream(connection.getInputStream());
            int p = in.read();
            System.out.println("No of frame is:" + p);

            for (int i = 0; i < p; i++) {
                v[i] = in.read();
                System.out.println(v[i]);
                //g[i] = v[i];
            }
            rand = rand.nextInt(p); //FRAME NO. IS RANDOMLY
GENERATED
            v[rand] = -1;
            int j = 0;
            int x = p;
            p--;
            boolean flag = false;
            for (int i = 0; i < x; i++)
            {
                if(v[i] != -1){
                    System.out.println("Received frame is: " + v[i]);
                    System.out.println("Window Size = " + (++j) + " to " + (++p));
                }
            }
            else{
```

```

        System.out.println("Received frame is: " + v[i]);
        System.out.println("Window Size = "+(j)+" - "+(p));
    }

    }

    for (int i = 0; i < p; i++)
        if (v[i] == -1) {
            System.out.println("Request to retransmit from packet no "
                               + (i+1) + " again!!");
            n = i;
            out.write(n);
            out.flush();
        }

    System.out.println();

    v[n] = in.read();
    System.out.println("Received frame is: " + v[n]);

    System.out.println("quiting");
} catch (Exception e) {
    System.out.println(e);
}

}
}

```

## Output:

The image displays two side-by-side Windows PowerShell terminal windows. The left window shows the execution of a Java program, with the user running `javac arqserver.java` and `java arqserver`. The output shows the server waiting for a connection, receiving a packet, and sending a response. The right window shows the execution of the same Java program, with the user running `javac arqclient.java` and `java arqclient`. The output shows the client sending a packet, receiving a response, and then sending a request to retransmit a packet.

```

Windows PowerShell
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PS C:\Users\vaibh\OneDrive\Desktop> javac arqserver.java
PS C:\Users\vaibh\OneDrive\Desktop> java arqserver
enter value of m :
3
Window size is = 4
enter elements :
12
11
18
09
waiting for connection
The number of packets sent is:4
PS C:\Users\vaibh\OneDrive\Desktop> |

Windows PowerShell
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PS C:\Users\vaibh\OneDrive\Desktop> javac arqclient.java
PS C:\Users\vaibh\OneDrive\Desktop> java arqclient
Localhost/127.0.0.1
No of frame is:4
12
11
18
9
Received frame is: -1
Window Size = 0 - 3
Received frame is: 11
Window Size = 1 to 4
Received frame is: 18
Window Size = 2 to 5
Received frame is: 9
Window Size = 3 to 6
Request to retransmit from packet no 1 again!!

Received frame is: 12
quiting
PS C:\Users\vaibh\OneDrive\Desktop> |

```