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Lab Practical #06:

Study Client-Server Socket programming - TCP & UDP

Practical Assignment #06:

1. **Write a C/Java code for TCP Server-Client Socket Programming.**
2. **Write a C/Java code for UDP Server-Client Socket Programming.**

1. For TCP Server-Client:

TCP Server Program:

```
// Demonstrating Server-side Programming
import java.net.*;
import java.io.*;

public class TcpServer {

   // Initialize socket and input stream
   private Socket s = null;
   private ServerSocket ss = null;
   private DataInputStream in = null;

   // Constructor with port
   public TcpServer(int port) {

      // Starts server and waits for a connection
      try
      {
         ss = new ServerSocket(port);
         System.out.println("Server started");

         System.out.println("Waiting for a client ...");

         s = ss.accept();
         System.out.println("Client accepted");
```

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```
        in = new DataInputStream(
            new BufferedInputStream(s.getInputStream()));

        String m = "";

        while (!m.equals("bye"))
        {
            try
            {
                m = in.readUTF();
                System.out.println(m);

            }
            catch(IOException i)
            {
                System.out.println(i);
            }
        }
        System.out.println("Closing connection");

        s.close();
        in.close();
    }
    catch(IOException i)
    {
        System.out.println(i);
    }
}

public static void main(String args[])
{
```

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```
    TcpServer s = new TcpServer(5000);
  }
}
```

TCP Client Program:

```
import java.io.DataInputStream;
import java.io.DataOutputStream;
import java.io.IOException;
import java.net.Socket;
import java.net.UnknownHostException;

public class TcpClient {
  private Socket s=null;
  private DataInputStream in=null;
  private DataOutputStream out=null;

  TcpClient(String addr, int port){
    try {
      s=new Socket(addr,port);
      System.out.println("Connected...");

      in=new DataInputStream(System.in);

      out=new DataOutputStream(s.getOutputStream());
    } catch (UnknownHostException e) {
      System.err.println(e);
      return;
    }
    catch(IOException i){
      System.out.println(i);
      return;
```

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```
    }

    String m="";

    while (!m.equals("bye")) {
      try {
        m=in.readLine();
        out.writeUTF(m);
      } catch (IOException e) {
        System.out.println(e);
      }
    }

    try {
      in.close();
      out.close();
      s.close();
    } catch (IOException e) {
      System.out.println(e);
    }
  }

  public static void main(String[] args) {
    TcpClient c=new TcpClient("127.0.0.1", 5000);
  }
}
```

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2. For UDP Server-Client:

UDP Server Program:

```
import java.io.IOException;
import java.net.DatagramPacket;
import java.net.DatagramSocket;

public class UdpServer
{
   public static void main(String[] args) throws IOException
   {
      // Step 1 : Create a socket to listen at port 1234
      DatagramSocket ds = new DatagramSocket(1234);
      System.out.println("Server Strat successfully...");
      byte[] receive = new byte[65535];

      DatagramPacket DpReceive = null;
      while (true)
      {

         // Step 2 : create a DatgramPacket to receive the data.
         DpReceive = new DatagramPacket(receive, receive.length);

         // Step 3 : revieve the data in byte buffer.
         ds.receive(DpReceive);

         System.out.println("Client:-" + data(receive));


         if (data(receive).toString().equals("bye"))
         {
```

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```
            System.out.println("Client sent bye.....EXITING");
            break;
        }

        receive = new byte[65535];
    }
}


public static StringBuilder data(byte[] a)
{
    if (a == null)
        return null;
    StringBuilder ret = new StringBuilder();
    int i = 0;
    while (a[i] != 0)
    {
        ret.append((char) a[i]);
        i++;
    }
    return ret;
}
}
```

UDP Client Program:

```
import java.io.IOException;
import java.net.DatagramPacket;
import java.net.DatagramSocket;
import java.net.InetAddress;
import java.util.Scanner;
```

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```
public class UdpClient
{
   public static void main(String args[]) throws IOException
   {
      Scanner sc = new Scanner(System.in);

      // Step 1:Create the socket object
      DatagramSocket ds = new DatagramSocket();

      InetAddress ip = InetAddress.getLocalHost();
      byte buf[] = null;

      while (true)
      {
         String inp = sc.nextLine();

         buf = inp.getBytes();

         // Step 2 : Create the datagramPacket for sending the data.
         DatagramPacket DpSend =
              new DatagramPacket(buf, buf.length, ip, 1234);

         // Step 3 : invoke the send call to actually send the data.
         ds.send(DpSend);


         if (inp.equals("bye"))
            break;
      }
   }
}
```