**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.**
3. **For TCP Server-Client:**

**TCP Server Program:**

**import java.net.\*;**

**import java.io.\*;**

**public class ServerTCP {**

**private Socket s = null;**

**private ServerSocket ss = null;**

**private DataInputStream in = null;**

**public ServerTCP(int port) {**

**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");**

**// input from client socket**

**in = new DataInputStream(**

**new BufferedInputStream(s.getInputStream()));**

**String m = "";**

**//read mesg from client here**

**while (!m.equals("Over"))**

**{**

**try**

**{**

**m = in.readUTF();**

**System.out.println(m);**

**}**

**catch(IOException i)**

**{**

**System.out.println(i);**

**}**

**}**

**System.out.println("Closing connection");**

**// Close connection**

**s.close();**

**in.close();**

**}**

**catch(IOException i)**

**{**

**System.out.println(i);**

**}**

**}**

**public static void main(String args[])**

**{**

**ServerTCP s = new ServerTCP(5023);**

**}**

**}**

**TCP Client Program:**

**import java.io.DataInputStream;**

**import java.io.DataOutputStream;**

**import java.io.IOException;**

**import java.net.Socket;**

**import java.net.UnknownHostException;**

**import java.util.\*;**

**public class ClientTCP {**

**private Socket s = null;**

**private DataInputStream in = null;**

**private DataOutputStream out = null;**

**// constructor**

**public ClientTCP(String addr, int port){**

**try{**

**s = new Socket(addr,port);**

**System.out.println("Connected");**

**// takes input from terminal**

**in = new DataInputStream(System.in);**

**// sends output to socket**

**out = new DataOutputStream(s.getOutputStream());**

**}**

**catch(UnknownHostException u){**

**System.out.println(u);**

**return;**

**}**

**catch(IOException i){**

**System.out.println(i);**

**return;**

**}**

**String k = "";**

**while(!k.equals("Over")){**

**try{**

**k = in.readLine();**

**out.writeUTF(k);**

**}**

**catch (IOException i) {**

**System.out.println(i);**

**}**

**}**

**//close connection**

**try {**

**in.close();**

**out.close();**

**s.close();**

**}**

**catch (IOException i) {**

**System.out.println(i);**

**}**

**}**

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

**ClientTCP c = new ClientTCP("127.0.0.1",5023);**

**}**

**}**

1. **For UDP Server-Client:**

**UDP Server Program:**

**import java.io.IOException;**

**import java.net.DatagramPacket;**

**import java.net.DatagramSocket;**

**import java.net.InetAddress;**

**import java.net.SocketException;**

**public class ServerUDP**

**{**

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

**{**

**// Step 1 : Create a socket to listen at port 1234**

**DatagramSocket ds = new DatagramSocket(1234);**

**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));**

**// Exit the server if the client sends "bye"**

**if (data(receive).toString().equals("bye"))**

**{**

**System.out.println("Client sent bye! EXITING");**

**break;**

**}**

**// Clear the buffer after every message.**

**receive = new byte[65535];**

**}**

**}**

**// A utility method to convert the byte array**

**// data into a string representation.**

**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;**

**public class ClientUDP**

**{**

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

**{**

**Scanner sc = new Scanner(System.in);**

**// Step 1:Create the socket object for carrying the data.**

**DatagramSocket ds = new DatagramSocket();**

**InetAddress ip = InetAddress.getLocalHost();**

**byte buf[] = null;**

**// loop while user not enters "bye"**

**while (true)**

**{**

**String inp = sc.nextLine();**

**// convert the String input into the byte array.**

**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);**

**// break the loop if user enters "bye"**

**if (inp.equals("bye"))**

**break;**

**}**

**}**

**}**