



Date: 22/08/2024

Lab Practical #07:

Study Client-Server Socket programming - TCP & UDP

Practical Assignment #07:

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:

```
import java.io.BufferedReader;
import java.io.IOException;
import java.io.InputStreamReader;
import java.io.PrintWriter;
import java.net.ServerSocket;
import java.net.Socket;

public class TCPServer {
    public static void main(String[] args) {
        ServerSocket serverSocket = null;
        Socket clientSocket = null;
        BufferedReader in = null;
        PrintWriter out = null;

        try {
            // Creating server socket
            serverSocket = new ServerSocket(Integer.parseInt(args[0]));
            System.out.println("Server is running on port " + args[0]);
            // Accepting client connection
            clientSocket = serverSocket.accept();
            System.out.println("Client connected");
            // Getting input and output streams
            in = new BufferedReader(new InputStreamReader(clientSocket.getInputStream()));
            out = new PrintWriter(clientSocket.getOutputStream(), true);

            String messageFromClient = in.readLine();
            System.out.println("Received message: " + messageFromClient);
```

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```
// Sending message to client
out.println("Server received your message: " + messageFromClient);
} catch (Exception e) {
    e.printStackTrace();
} finally {
    try {
        if (in != null)
            in.close();
        if (out != null)
            out.close();
        if (clientSocket != null)
            clientSocket.close();
        if (serverSocket != null)
            serverSocket.close();
    } catch (IOException e) {
        e.printStackTrace();
    }
}
}
```

TCP Client Program:

```
import java.io.BufferedReader;
import java.io.IOException;
import java.io.InputStreamReader;
import java.io.PrintWriter;
import java.net.Socket;

public class TCPClient {
    public static void main(String[] args) {
        Socket socket = null;
        BufferedReader in = null;
        PrintWriter out = null;

        try{
            // Creating client socket
```

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```
socket = new Socket(args[0], Integer.parseInt(args[1]));

// Setting up input and output streams
in = new BufferedReader(new InputStreamReader(socket.getInputStream()));
out = new PrintWriter(socket.getOutputStream(), true);

//sending response from server
String messageFromServer = in.readLine();
System.out.println("Message fro server: " + messageFromServer);
} catch(IOException e){
    e.printStackTrace();
} finally{
    try {
        if (in != null)
            in.close();
        if (out != null)
            out.close();
        if (socket != null)
            socket.close();
    } catch (IOException e) {
        e.printStackTrace();
    }
}
}
```

2. For UDP Server-Client:

UDP Server Program:

```
import java.net.DatagramPacket;
import java.net.DatagramSocket;
import java.net.InetAddress;

public class UDPServer {
    public static void main(String[] args) {
        DatagramSocket socket = null;
        try {
```

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```
socket = new DatagramSocket(8080);
byte[] receiveBuffer = new byte[1024];
byte[] sendBuffer;

while (true) {
    DatagramPacket receivePacket = new DatagramPacket(receiveBuffer, receiveBuffer.length);
    socket.receive(receivePacket);
    String clientMessage = new String(receivePacket.getData(), 0, receivePacket.getLength());
    System.out.println("Client: " + clientMessage);

    InetAddress clientAddress = receivePacket.getAddress();
    int clientPort = receivePacket.getPort();

    String serverMessage = "Hello from server";
    sendBuffer = serverMessage.getBytes();
    DatagramPacket sendPacket = new DatagramPacket(sendBuffer, sendBuffer.length, clientAddress,
        clientPort);
    socket.send(sendPacket);
}
} catch (Exception e) {
    e.printStackTrace();
} finally {
    if (socket != null && !socket.isClosed()) {
        socket.close();
    }
}
}
```

UDP Client Program:

```
import java.net.DatagramPacket;
import java.net.DatagramSocket;
import java.net.InetAddress;

public class UDPClient {
    public static void main(String[] args) {
        DatagramSocket socket = null;
```



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```
try {
    socket = new DatagramSocket();
    InetAddress serverAddress = InetAddress.getByName("localhost");
    byte[] sendBuffer;
    byte[] receiveBuffer = new byte[1024];

    String clientMessage = "Hello from client";
    sendBuffer = clientMessage.getBytes();
    DatagramPacket sendPacket = new DatagramPacket(sendBuffer, sendBuffer.length, serverAddress, 8080);
    socket.send(sendPacket);

    DatagramPacket receivePacket = new DatagramPacket(receiveBuffer, receiveBuffer.length);
    socket.receive(receivePacket);
    String serverMessage = new String(receivePacket.getData(), 0, receivePacket.getLength());
    System.out.println("Server: " + serverMessage);
} catch (Exception e) {
    e.printStackTrace();
} finally {
    if (socket != null && !socket.isClosed()) {
        socket.close();
    }
}
}
```