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Class:	S. Y. B.Tech (Computer Engineering)
Course:	Computer Networks (DJ12CEL405)
Date of Performance:	
Date of Submission:	
Experiment No.:	06
Aim:	Socket TCP and UDP

AIM: TO IMPLEMENT TCP AND UDP SOCKET COMMUNICATION IN JAVA.

TCP:

CODE:

Server.java

```
// A Java program for a Server
import java.net.*;
import java.io.*;

public class Server {
    // initialize socket and input stream
    private Socket socket = null;
    private ServerSocket server = null;
    private DataInputStream in = null;

    private DataInputStream input = null;
    private DataOutputStream out = null;

    // constructor with port
    public Server(int port) {
        // starts server and waits for a connection
        try {
            server = new ServerSocket(port);
            System.out.println("Server started");

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

            socket = server.accept();
            System.out.println("Client accepted");
```



```
// takes input from the client socket
in = new DataInputStream(
    new BufferedInputStream(socket.getInputStream()));

out = new DataOutputStream(
    socket.getOutputStream());

input = new DataInputStream(System.in);

String line = "";

// reads message from client until "Over" is sent
while (!line.equals("Over")) {
    try {
        line = in.readUTF();
        System.out.println(line);

        line = input.readLine();
        out.writeUTF(line);

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

// close connection
socket.close();
in.close();
} catch (IOException i) {
    System.out.println(i);
}
}

public static void main(String args[]) {
    Server server = new Server(5000);
}
}
```



Client.java

```
// A Java program for a Client
import java.io.*;
import java.net.*;

public class Client {
    // initialize socket and input output streams
    private Socket socket = null;
    private DataInputStream input = null;
    private DataOutputStream out = null;

    private DataInputStream in = null;

    // constructor to put ip address and port
    public Client(String address, int port) {
        // establish a connection
        try {
            socket = new Socket(address, port);
            System.out.println("Connected");

            // takes input from terminal
            input = new DataInputStream(System.in);

            // sends output to the socket
            out = new DataOutputStream(
                socket.getOutputStream());

            in = new DataInputStream(
                new BufferedInputStream(socket.getInputStream()));
        } catch (UnknownHostException u) {
            System.out.println(u);
            return;
        } catch (IOException i) {
            System.out.println(i);
            return;
        }
    }

    // string to read message from input
    String line = "";

    // keep reading until "Over" is input
    while (!line.equals("Over")) {
        try {
            line = input.readLine();
        }
    }
}
```



```
        out.writeUTF(line);

        line = in.readUTF();
        System.out.println(line);
    } catch (IOException i) {
        System.out.println(i);
    }
}

// close the connection
try {
    input.close();
    out.close();
    socket.close();
} catch (IOException i) {
    System.out.println(i);
}
}

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

OUTPUT:

```
PROBLEMS 4 OUTPUT TERMINAL
> TERMINAL
Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS C:\Users\Jadhav\Desktop\BTech\4th sem\CN\Code> & 'C:\Users\Jadhav\Java\jdk-16\bin\java.exe' '-XX:+ShowCodeDetailsInExceptionMessages' '-cp' 'C:\Users\Jadhav\AppData\Roaming\Code\User\workspaceStorage\73a373137791b682fc3df68db637016b\redhat.java\jdt_ws\code_3594955b\bin' 'Server'
Server started
Waiting for a client ...
Client accepted
Hello Server this is client Roger
Hello Client Roger this is client Liam
we can now talk across
Yes ...sure
[]

Windows PowerShell
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PS C:\Users\Jadhav\Desktop\BTech\4th sem\CN\Code> & 'C:\Users\Jadhav\Java\jdk-16\bin\java.exe' '-XX:+ShowCodeDetailsInExceptionMessages' '-cp' 'C:\Users\Jadhav\AppData\Roaming\Code\User\workspaceStorage\73a373137791b682fc3df68db637016b\redhat.java\jdt_ws\code_3594955b\bin' 'Client'
Connected
Hello Server this is client Roger
Hello Client Roger this is client Liam
we can now talk across
Yes ...sure
[]
```



UDP:

CODE:

Server.java:

```
import java.io.*;
import java.net.*;

class Server {
    public static void main(String args[]) throws Exception {
        DatagramSocket serverSocket = new DatagramSocket(9876);
        BufferedReader inFromServer = new BufferedReader(new InputStreamReader(System.in));
        byte[] receiveData = new byte[1024];
        byte[] sendData = new byte[1024];
        while (true) {
            DatagramPacket receivePacket = new DatagramPacket(receiveData, receiveData.length);
            serverSocket.receive(receivePacket);
            String sentence = new String(receivePacket.getData());
            System.out.println("RECEIVED: " + sentence);
            InetAddress IPAddress = receivePacket.getAddress();
            int port = receivePacket.getPort();
            String sentSentence = inFromServer.readLine();
            // String capitalizedSentence = sentence.toUpperCase();
            sendData = sentSentence.getBytes();
            DatagramPacket sendPacket = new DatagramPacket(sendData, sendData.length, IPAddress,
port);
            serverSocket.send(sendPacket);
            receiveData = new byte[1024];
            if (sentSentence.equalsIgnoreCase("bye")) {
                serverSocket.close();
                break;
            }
        }
    }
}
```

Client.java:

```
import java.io.*;
import java.net.*;

class Client {
    public static void main(String args[]) throws Exception {
        BufferedReader inFromUser = new BufferedReader(new InputStreamReader(System.in));
        DatagramSocket clientSocket = new DatagramSocket();
        InetAddress IPAddress = InetAddress.getByName("localhost");
        byte[] sendData = new byte[1024];
        byte[] receiveData = new byte[1024];
        while (true) {
            String sentence = inFromUser.readLine();
            sendData = sentence.getBytes();
            DatagramPacket sendPacket = new DatagramPacket(sendData, sendData.length, IPAddress,
9876);
            clientSocket.send(sendPacket);
        }
    }
}
```



```
DatagramPacket receivePacket = new DatagramPacket(receiveData, receiveData.length);
clientSocket.receive(receivePacket);
String modifiedSentence = new String(receivePacket.getData());
System.out.println("FROM SERVER:" + modifiedSentence);
receiveData = new byte[1024];
if (sentence.equalsIgnoreCase("bye")) {
    clientSocket.close();
    break;
}
}
}
```

OUTPUT:

```
PS C:\Users\Jadhav\Desktop\BTech\4th sem\CN\Code> java -cp "C:\Users\Jadhav\AppData\Roaming\Code\User\workspace Storage\73a373137791b682fc3df68db637016b\redhat.java\jdt_ws\Code_3594955b\bin" 'Server'
RECEIVED: Hello This is Client George
This is Server Roger
RECEIVED: How are we connected
We used UDP to connect
RECEIVED: bye
bye
PS C:\Users\Jadhav\Desktop\BTech\4th sem\CN\Code>

PS C:\Users\Jadhav\Desktop\BTech\4th sem\CN\Code> java -cp "C:\Users\Jadhav\AppData\Roaming\Code\User\workspace Storage\73a373137791b682fc3df68db637016b\redhat.java\jdt_ws\Code_3594955b\bin" 'Client'
Hello This is Client George
FROM SERVER:This is Server Roger
How are we connected
FROM SERVER:We used UDP to connect
bye
FROM SERVER:bye
PS C:\Users\Jadhav\Desktop\BTech\4th sem\CN\Code>
```