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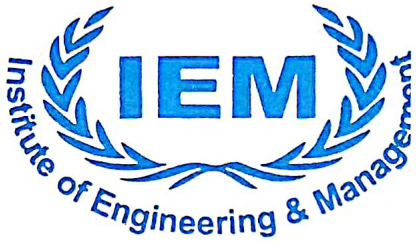

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SEMESTER : 6th

ROLL NO. : 57

ASSIGNMENT OF DEPARTMENT : Computer Networks Lab

DATE OF EXPERIMENT / PROJECT : 07/04/2022

DATE OF SUBMISSION :

TITLE : Socket programming with TCP & UDP

OBJECT : Socket programming with TCP & UDP.

Objective :- Socket programming with UDP & TCP.

Introduction :-

Socket programming is used to communicate between the application. In Java, we communicate between different JRE running applications. It can be connection oriented or connectionless. The client in Socket programming must know two information. ie → (a) IP address or Server.
(b) Port number of application process

- TCP → (Transmission control protocol) is a network protocol that connect two hosts to exchange data streams. It guarantees the delivery of data & packets in the same order as they were sent.
  - → It is connection oriented (Handshaking procedure)
  - → Reliable byte-stream.
- UDP → (User datagram protocol) is a light weight data transport protocol that works on top of IP.
  - → detects corrupt data in packets but not solve.
  - → connectionless
  - → Not Reliable data transfer.
  - → Uses DNS lookup to find the IP-address for "host name".

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* Code →

Tcp- client in java

```
import java.io.*;
import java.net.*;
class TcpClient {
                public static void main ( String args[]) throws Exception
 {
    String line, newLine;
    try {
        DataInputStream in = new DataInputStream (System.in);
        Socket cs = new Socket ("LocalHost", 6789);
        System.out.println ("client started....");
DataInputStream inp = new DataInputstream (cs.getInputStream());
DataOutputStream out = new DataOutputStream (cs.getOutputStream());
while (true) {
          newLine = in.readLine();
   if (newLine.equals ("q")) {
        out.writeBytes ("client is down...." + '\n');
        return;
        }
  else {
        out.writeBytes (newLine + '\n');
        }
    line = inp.readLine();
  System.out.println (" Received from server : " +line);
          }
     }
    catch (Exception e) {
                        }
      }
   }
```

TCP server in java :

```
import java.io.*;
import java.io.*;
class TcpServer{
   public static void main(String args[]) throws Exception{
      try{
        String line, newLine;
        ServerSocket ss = new ServerSocket(6789);
      while(true){
          Socket s = ss.accept();
      System.out.println("server started....");
DataInputStream inp = new DataInputStream(s.getInputStream());
DataInputStream out = new DataOutputStream(s.getOutputStream());
DataInputStream in = new DataInputStream(System.in);
while(true){
 System.out.println("Press 'q' if you want to exit server");
  line = inp.readLine();
 System.out.println("Received from client :" + line);
  newLine = in.readLine();
  if(newLine.equals("q")){
     Out.writeBytes("Server is down..." + '\n');
      return;
      }
      else{
            out.writeBytes(newLine + '\n');
              }
            }
          }
        }
      catch(Exception e){ }
    }
  }
```

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UDP client in java:

```
import java.io.*;
import java.net.*;
class UDPclient {
   public static void main (String args[]) throws Exception{
   BufferedReader inFromUser = new BufferedReader (new InputStreamReader
                                                    (System.in));
   DatagramSocket clientSocket = new DatagramSocket();
   InetAddress IPAddress = InetAddress.getByName ("hostname");
   byte[] sendData = new byte[1024];
   byte [] receiveData = new byte[1024];
   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 modefiedSentence = new String (receivePacket.getdata());
   System.out.println ("FROM SERVER:" + modifiedSentence);
    clientsocket.close();
     }
   }
```

UDP server in Java:

```
import java.io.*;
import java.net.*;
Class UDPclient {
      Public static void main( String args[]) throws Exception{
```

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```
DatagramSocket serverSocket = new DatagramSocket(9876);
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());
InetAddress IPAddress = receivePacket.getAddress();
int port = receivePacket.getPort();
String catitalizedSentence = sentence.toUpperCase();
SendData = capetalizedSentence.getBytes();
DatagramPacket sendpacket = new DatagramPacket(sendData,
                    SendData.length,IPAddress, port);
 clientSocket.send(sendPacket);
DatagramPacket receivePacket = new DatagramPacket(receiveData,
                                receiveData.length);
   serverSocket.send(sendPacket);
    }
  }
}
```

Discussion:

For the socket programming with UDP & TCP, I communicated in same device as well as different devices for both UDP & TCP. In background I used wireshark to see the data packets and the communication. Firstly I run the server side code, then I run the client side code & then communication established. In wireshark I got all the details related to TCP & UDP packets.

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