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## Experiment - 10

Aim:- Socket programming using TCP or UDP.

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### Theory:-

Socket programming is a crucial aspect of network communication, enabling data exchange between computers over a network. TCP (Transmission Control Protocol) and UDP (User Datagram Protocol) are two commonly used transport layer protocols for socket programming.

#### 1. TCP

TCP ensures reliable ordered and error check delivery of data between two devices. It establishes a connection before data exchange.

Data is sent as a stream of bytes and TCP manages the packetization and reassembly of data.

TCP uses acknowledgements to confirm the receipt of data packets and retransmits lost packet if necessary.

TCP is suitable for application where data integrity and order are crucial such as web browsing, email and file transfer.



## 2.) ~~Q~~ UDP

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UDP don't establish a connection & does n't. guarantee delivery or order of packets. Each UDP packet is treated as an independent unit of data.

UDP doesn't use acknowledgement, so its faster but can result in lost or out-of-order packets.

Socket connection consist of client side connection and server side connection.

### Client-Side programming :-

To connect to another machine we need a socket connection. A socket connection means two machine have information about each other network location and TCP Port.

The java.~~com~~ net Socket class represents a socket. To open a socket, ~~socket~~

```
Socket socket = new Socket("127.0.0.1")
```

The first argument - IP address of (5000) local host where code will run on the single stand alone machine. The second argument TCP port (Just a number representing which application to run on a server. For example, HTTP runs on port 80. Port number can be from 0 to 65535.

To communicate over a socket connection, streams

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used to both input and output the data.

Conclusion:- learnt about socket programming and how to implement it in java using TCP or UDP.

(BT)

~~Post 123.~~

## SERVER PROGRAM:

```
import java.io.*;

import java.net.*;

public class MyServer1
{
    public static void main(String args[])throws IOException
    {
        System.out.println("Server started at port 3333");
        ServerSocket ss = new ServerSocket(3333);
        Socket s = ss.accept(); //This will establish connection between client and server
        System.out.println("Connected");
        BufferedReader br1 = new BufferedReader(new InputStreamReader(System.in));
        System.out.println("Enter the data to be sent to the client");
        String nickname = br1.readLine();
        BufferedReader br = new BufferedReader(new InputStreamReader(s.getInputStream()));
        String msg = br.readLine();
        System.out.println("Client Data: "+msg);
        OutputStreamWriter os = new OutputStreamWriter(s.getOutputStream());
        PrintWriter out = new PrintWriter(os);
        out.println(nickname);
        out.flush();
        s.close();
        ss.close();
    }
}
```



## CLIENT PROGRAM:

```
import java.net.*;

import java.io.*;

public class MyClient1
{
    public static void main(String args[])throws IOException
    {
        Socket s = new Socket("localhost",3333);

        System.out.println("Enter the msg to be sent: ");

        BufferedReader br = new BufferedReader(new InputStreamReader(System.in));

        String str = br.readLine();

        OutputStreamWriter os = new OutputStreamWriter(s.getOutputStream());

        PrintWriter out = new PrintWriter(os);

        out.println(str);

        os.flush();

        BufferedReader br1 = new BufferedReader(new InputStreamReader(s.getInputStream()));

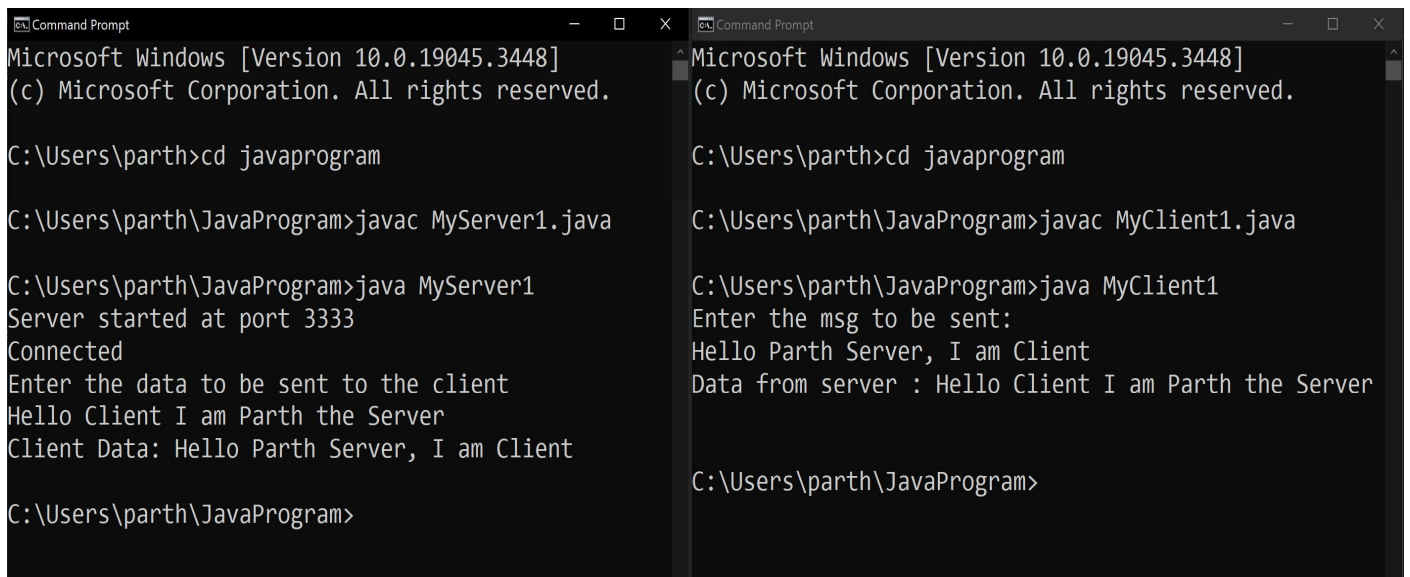
        String nickname = br1.readLine();

        System.out.println("Data from server : "+nickname);

        s.close();

    }
}
```

## OUTPUT:



```
Microsoft Windows [Version 10.0.19045.3448]
(c) Microsoft Corporation. All rights reserved.

C:\Users\parth>cd javaprogram

C:\Users\parth\JavaProgram>javac MyServer1.java

C:\Users\parth\JavaProgram>java MyServer1
Server started at port 3333
Connected
Enter the data to be sent to the client
Hello Client I am Parth the Server
Client Data: Hello Parth Server, I am Client
C:\Users\parth\JavaProgram>

Microsoft Windows [Version 10.0.19045.3448]
(c) Microsoft Corporation. All rights reserved.

C:\Users\parth>cd javaprogram

C:\Users\parth\JavaProgram>javac MyClient1.java

C:\Users\parth\JavaProgram>java MyClient1
Enter the msg to be sent:
Hello Parth Server, I am Client
Data from server : Hello Client I am Parth the Server

C:\Users\parth\JavaProgram>
```