



Shri Yashwantrao Bhonsale Education Society's
YASHWANTRAO BHONSALE INSTITUTE OF TECHNOLOGY
(DTE CODE : 3470) (MSBTE Code : 1742)

Approved by AICTE, DTE & Affiliated to Mumbai University & MSBTE Mumbai
(NBA Accredited ME, CE, EE Diploma Programs)

Experiment No. 8

Aim: Socket programming using TCP:

Resource required: Java Development Kit (JDK), Text Editor / IDE, Command Prompt/ Terminal, Network

Theory:

Java: Java is a programming language and platform used to develop applications that can run on any device with a Java Virtual Machine (JVM).

Socket Programming: Socket Programming is a way to allow two computers (or programs) to communicate with each other over a network.

- A socket is like an endpoint — a door through which data enters or leaves a program.
- One side acts as a Server, which waits for connections.
- The other side acts as a Client, which connects to the server.

TCP (Transmission Control Protocol): TCP (Transmission Control Protocol) is connection-oriented — the client must connect before sending data. We'll create:

- TCPServer.java → Waits for connection and replies to client.
- TCPClient.java → Connects to server and sends a message.

TCP Server Code — TCPServer.java

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

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

```
public class TCPServer {
```

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

```
        try {
```

```
            ServerSocket serverSocket = new ServerSocket(6789);
```



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```
System.out.println("Server is waiting for client connection...");
```

```
Socket socket = serverSocket.accept(); // Wait for client
```

```
System.out.println("Connected to: " + socket.getInetAddress());
```

```
// Input from client
```

```
BufferedReader in = new BufferedReader(new  
InputStreamReader(socket.getInputStream()));
```

```
// Output to client
```

```
PrintWriter out = new PrintWriter(socket.getOutputStream(), true);
```

```
String clientMessage = in.readLine();
```

```
System.out.println("ClientStaff says from BKC: " + clientMessage);
```

```
out.println("Hello Client Staff from BKC, message received!");
```

```
socket.close();
```

```
serverSocket.close();
```

```
} catch (Exception e) {
```

```
System.out.println(e);
```

```
}
```

```
}
```

```
}
```



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TCP Client Code — TCPClient.java

```
import java.io.*;

import java.net.*;

public class TCPClient {

    public static void main(String[] args) {

        try {

            Socket socket = new Socket("localhost", 6789);

            // Output to server

            PrintWriter out = new PrintWriter(socket.getOutputStream(), true);

            // Input from server

            BufferedReader in = new BufferedReader(new
InputStreamReader(socket.getInputStream()));

            out.println("Hello Server! This is Client Staff from BKC.");

            String response = in.readLine();

            System.out.println("Server says: " + response);

            socket.close();

        } catch (Exception e) {

            System.out.println(e);

        }

    }

}
```



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Output:

```
C:\Windows\System32\cmd.e X + v - □ X
Microsoft Windows [Version 10.0.26100.6584]
(c) Microsoft Corporation. All rights reserved.

C:\Users\janu\OneDrive\Documents\CN>javac TCPServer.java

C:\Users\janu\OneDrive\Documents\CN>java TCPServer
Server is waiting for client connection...
Connected to: /127.0.0.1
ClientStaff says from BKC: Hello Server! This is Client Staff from BKC.

C:\Users\janu\OneDrive\Documents\CN>

C:\Windows\System32\cmd.e X + v - □ X
Microsoft Windows [Version 10.0.26100.6584]
(c) Microsoft Corporation. All rights reserved.

C:\Users\janu\OneDrive\Documents\CN>javac TCPClient.java

C:\Users\janu\OneDrive\Documents\CN>java TCPClient
Server says: Hello Client Staff from BKC, message received!

C:\Users\janu\OneDrive\Documents\CN>
```

Conclusion:

In this practical, we successfully implemented Socket Programming using TCP (Transmission Control Protocol) to establish communication between a client and a server.

The client sent a message to the server through a TCP connection, and the server received it successfully, proving that data transmission over a reliable, connection-oriented network is possible using sockets.

This experiment helped us understand:

- How to create sockets using Java's ServerSocket and Socket classes.
- How data is transmitted using input and output streams.
- The concept of client-server communication over TCP.

Thus, the practical demonstrated reliable, ordered, and error-free data communication using TCP socket programming in Java.