

## File Transfer Server :

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

class FileTransfer_Server
{
    public static void main(String[] args) throws IOException
    {
        ServerSocket serverSocket = new ServerSocket(15123);
        System.out.println("Server waiting for connections...");
        Socket socket = serverSocket.accept();
        System.out.println("Connection established: " + socket);
        File transferFile = new File("FileTransfer_File.txt");
        byte[] bytearray = new byte[(int) transferFile.length()];
        FileInputStream fin = new FileInputStream(transferFile);
        BufferedInputStream bin = new BufferedInputStream(fin);
        bin.read(bytearray, 0, bytearray.length);
        OutputStream os = socket.getOutputStream();
        System.out.println("Sending file...");
        os.write(bytearray, 0, bytearray.length);
        os.flush();
        System.out.println("File Sent successfully");
        socket.close();
        serverSocket.close();
    }
}
```

## File Transfer Client :

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

public class FileTransfer_Client
{
    public static void main(String[] args) throws IOException
    {
        Socket socket = new Socket("127.0.0.1", 15123);
        System.out.println("Connected to server: " + socket);
        InputStream is = socket.getInputStream();
        FileOutputStream fos = new FileOutputStream("FileTransfer_File.txt");
        BufferedOutputStream bos = new BufferedOutputStream(fos);
        int bufferSize = 1024;
        byte[] bytearray = new byte[bufferSize];
        int bytesRead;
        while ((bytesRead = is.read(bytearray, 0, bufferSize)) != -1)
            bos.write(bytearray, 0, bytesRead);
        bos.flush();
        bos.close();
        System.out.println("File received successfully.");
        socket.close();
    }
}
```

```
Command Prompt
C:\Users\poove\OneDrive\Desktop\NC_Output>java FileTransfer_Server
Server waiting for connections...
Connection established: Socket[addr=/127.0.0.1,port=62664,localport=15123]
Sending file...
File Sent successfully

C:\Users\poove\OneDrive\Desktop\NC_Output>
```

```
Command Prompt
C:\Users\poove\OneDrive\Desktop\NC_Output>java FileTransfer_Client
Connected to server: Socket[addr=/127.0.0.1,port=15123,localport=62664]
File received successfully.

C:\Users\poove\OneDrive\Desktop\NC_Output>
```

## Remote Command Server :

```
import java.io.*;
import java.net.ServerSocket;
import java.net.Socket;
import java.util.Scanner;
class RemoteCommand_Server
{
    public static void main(String[] args) throws IOException
    {
        Scanner scanner = new Scanner(System.in);
        System.out.print("Enter the Port Address: ");
        int port = Integer.parseInt(scanner.nextLine());
        try (ServerSocket serverSocket = new ServerSocket(port)) {
            System.out.println("Server is Ready To Receive a Command.");
            System.out.println("Waiting...");
            try (Socket clientSocket = serverSocket.accept()) {
                if (clientSocket.isConnected())
                    System.out.println("Client Socket is Connected Successfully.");
                InputStream in = clientSocket.getInputStream();
                OutputStream out = clientSocket.getOutputStream();
                BufferedReader reader = new BufferedReader(new InputStreamReader(in));
                PrintWriter writer = new PrintWriter(out, true);
                String cmd = reader.readLine();
                System.out.println("Received command: " + cmd);
                ProcessBuilder processBuilder = new ProcessBuilder(cmd.split("\\s+"));
                Process process = processBuilder.start();
                try (BufferedReader commandOutput = new BufferedReader(new
InputStreamReader(process.getInputStream()))) {
                    String outputLine;
                    while ((outputLine = commandOutput.readLine()) != null)
                        writer.println(outputLine);
                }
            }
        }
    }
}
```

## Remote Command Client :

```
import java.io.*;
import java.net.Socket;
import java.util.Scanner;
class RemoteCommandClient
{
    public static void main(String[] args) throws IOException
    {
        Scanner scanner = new Scanner(System.in);
        System.out.print("Enter the Port Address: ");
        int port = Integer.parseInt(scanner.nextLine());
        try (Socket socket = new Socket("localhost", port)) {
            if (socket.isConnected())
                System.out.println("Server Socket is Connected Successfully.");
            InputStream in = socket.getInputStream();
            OutputStream out = socket.getOutputStream();
            BufferedReader userInputReader = new BufferedReader(new
InputStreamReader(System.in));
            BufferedReader serverReader = new BufferedReader(new InputStreamReader(in));
            PrintWriter writer = new PrintWriter(out, true);
            System.out.print("Enter the Command to be Executed: ");
            String command = userInputReader.readLine();
            writer.println(command);
            String serverOutput;
            while ((serverOutput = serverReader.readLine()) != null)
                System.out.println("Server Output: " + serverOutput);
        }
    }
}
```

```
Command Prompt
C:\Users\poove\OneDrive\Desktop\NC_Output>java RemoteCommand_Server
Enter the Port Address: 10
Server is Ready To Receive a Command.
Waiting...
Client Socket is Connected Successfully.
Received command: notepad RemoteCommand_File

C:\Users\poove\OneDrive\Desktop\NC_Output>
```

```
Command Prompt
C:\Users\poove\OneDrive\Desktop\NC_Output>java RemoteCommandClient
Enter the Port Address: 10
Server Socket is Connected Successfully.
Enter the Command to be Executed: notepad RemoteCommand_File

C:\Users\poove\OneDrive\Desktop\NC_Output>
```

## Chat Server :

```
import java.io.*;
import java.net.ServerSocket;
import java.net.Socket;
class Chat_Server
{
    public static void main(String[] args) throws IOException
    {
        ServerSocket serverSocket = new ServerSocket(3000);
        System.out.println("Server ready for chatting");
        Socket clientSocket = serverSocket.accept();
        System.out.println("Client connected: " + clientSocket);
        BufferedReader keyRead = new BufferedReader(new
InputStreamReader(System.in));
        OutputStream ostream = clientSocket.getOutputStream();
        PrintWriter pwrite = new PrintWriter(ostream, true);
        InputStream istream = clientSocket.getInputStream();
        BufferedReader receiveRead = new BufferedReader(new
InputStreamReader(istream));
        String receiveMessage, sendMessage;
        while (true) {
            if ((receiveMessage = receiveRead.readLine()) != null)
                System.out.println("Client: " + receiveMessage);
            sendMessage = keyRead.readLine();
            pwrite.println("Server: " + sendMessage);
            pwrite.flush();
        }
    }
}
```

## Chat Client :

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

class Chat_Client
{
    public static void main(String[] args) throws IOException
    {
        Socket socket = new Socket("127.0.0.1", 3000);

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

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

        OutputStream ostream = socket.getOutputStream();
        PrintWriter pwrite = new PrintWriter(ostream, true);
        InputStream istream = socket.getInputStream();

        BufferedReader receiveRead = new BufferedReader(new
InputStreamReader(istream));

        String receiveMessage, sendMessage;

        System.out.println("Start the chitchat, type and press Enter key");
        while (true) {
            sendMessage = keyRead.readLine();
            pwrite.println("Client: " + sendMessage);
            pwrite.flush();
            if ((receiveMessage = receiveRead.readLine()) != null)
                System.out.println(receiveMessage);
        }
    }
}
```



```
Command Prompt - java Cha X + v - □ X
C:\Users\poove\OneDrive\Desktop\NC_Output>java Chat_Server
Server ready for chatting
Client connected: Socket[addr=/127.0.0.1,port=49480,localport=3000]
Client: Client: Rango
Rangoli
Client: Client: Kolangal
Nee Potai
Client: Client: Kolam Pottaval
Kaigal Vaazhi
Client: Client: Sunthara Malligai Santhana Malligai
Sithira Punnagai Vannam Minna..
```

```
Command Prompt - java Cha X + v - □ X
C:\Users\poove\OneDrive\Desktop\NC_Output>java Chat_Client
Connected to server: Socket[addr=/127.0.0.1,port=3000,localport=49480]
Start the chitchat, type and press Enter key
Rango
Server: Rangoli
Kolangal
Server: Nee Potai
Kolam Pottaval
Server: Kaigal Vaazhi
Sunthara Malligai Santhana Malligai
Server: Sithira Punnagai Vannam Minna..
```

## Concurrent Server Server :

```
import java.io.*;
import java.net.ServerSocket;
import java.net.Socket;
import java.util.concurrent.ExecutorService;
import java.util.concurrent.Executors;
class ConcurrentServer_Server
{
    public static void main(String[] args) throws IOException
    {
        ServerSocket ss = new ServerSocket(8500);
        System.out.println("Waiting for clients...");
        ExecutorService executorService = Executors.newFixedThreadPool(5);
        while (true) {
            Socket clientSocket = ss.accept();
            System.out.println("Client connected: " + clientSocket);
            executorService.execute(new ConcurrentServer_ClientHandler(clientSocket));
        }
    }
}
```

```
class ConcurrentServer_ClientHandler implements Runnable
{
    private final Socket clientSocket;
    public ConcurrentServer_ClientHandler(Socket clientSocket)
    {
        this.clientSocket = clientSocket;
    }
    @Override
    public void run()
    {
        try {
            BufferedReader br = new BufferedReader(new
```

```
InputStreamReader(clientSocket.getInputStream()));
String clientName = br.readLine();
System.out.println("\nCLIENT NAME: " + clientName);
int num = Integer.parseInt(br.readLine());
int square = num * num;
PrintWriter pw = new PrintWriter(clientSocket.getOutputStream(), true);
pw.println(square);
System.out.println("OUTPUT - The square of " + num + " is " + square);
clientSocket.close();
}
catch (IOException e) {
    e.printStackTrace();
}
}
}
```

## Concurrent Server Client1 :

```
import java.io.*;
import java.net.Socket;
public class ConcurrentServer_Client1
{
    public static void main(String[] args) throws IOException
    {
        Socket socket = new Socket("localhost", 8500);
        BufferedReader br = new BufferedReader(new InputStreamReader(System.in));
        int num = Integer.parseInt(br.readLine());
        PrintWriter pw = new PrintWriter(socket.getOutputStream(), true);
        pw.println("Client 1");
        pw.println(num);
        BufferedReader br1 = new BufferedReader(new
        InputStreamReader(socket.getInputStream()));
        int square = Integer.parseInt(br1.readLine());
        System.out.println("Square of " + num + " is " + square + "\n");
        socket.close();
    }
}
```

## Concurrent Server Client2 :

```
import java.io.*;
import java.net.Socket;
public class ConcurrentServer_Client2
{
    public static void main(String[] args) throws IOException
    {
        Socket s = new Socket("localhost", 8500);
        BufferedReader br = new BufferedReader(new InputStreamReader(System.in));
        int num = Integer.parseInt(br.readLine());
        PrintWriter pw = new PrintWriter(s.getOutputStream(), true);
        pw.println("Client 2");
        pw.println(num);
        BufferedReader br1 = new BufferedReader(new
        InputStreamReader(s.getInputStream()));
        double squareRoot = Double.parseDouble(br1.readLine());
        System.out.println("Square of " + num + " is " + squareRoot);
        s.close();
    }
}
```

```
Command Prompt - java Con  X + v - □ X

C:\Users\poove\OneDrive\Desktop\NC_Output>java ConcurrentServer_
Server
Waiting for clients...
Client connected: Socket[addr=/127.0.0.1,port=49779,localport=85
00]

CLIENT NAME: Client 1
OUTPUT - The square of 69 is 4761
Client connected: Socket[addr=/127.0.0.1,port=49783,localport=85
00]

CLIENT NAME: Client 2
OUTPUT - The square of 96 is 9216
```

```
Command Prompt  X + v - □ X

C:\Users\poove\OneDrive\Desktop\NC_Output>java ConcurrentServer_
Client1
69
Square of 69 is 4761

C:\Users\poove\OneDrive\Desktop\NC_Output>java ConcurrentServer_
Client2
96
Square of 96 is 9216.0

C:\Users\poove\OneDrive\Desktop\NC_Output>
```