

- **One Way Communication**

#### **Server Side**

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

public class ServerOneWay {
    public static void main(String[] args) {
        try {
            ServerSocket serverSocket = new ServerSocket(9090);
            System.out.println("Server listening on port 9090...");

            while (true) {
                Socket clientSocket = serverSocket.accept();
                System.out.println("Client connected: " +
                    clientSocket.getInetAddress().getHostAddress());

                // Send response to the client
                PrintWriter out = new PrintWriter(clientSocket.getOutputStream(), true);
                out.println("Hello, Client! This is the server response.");

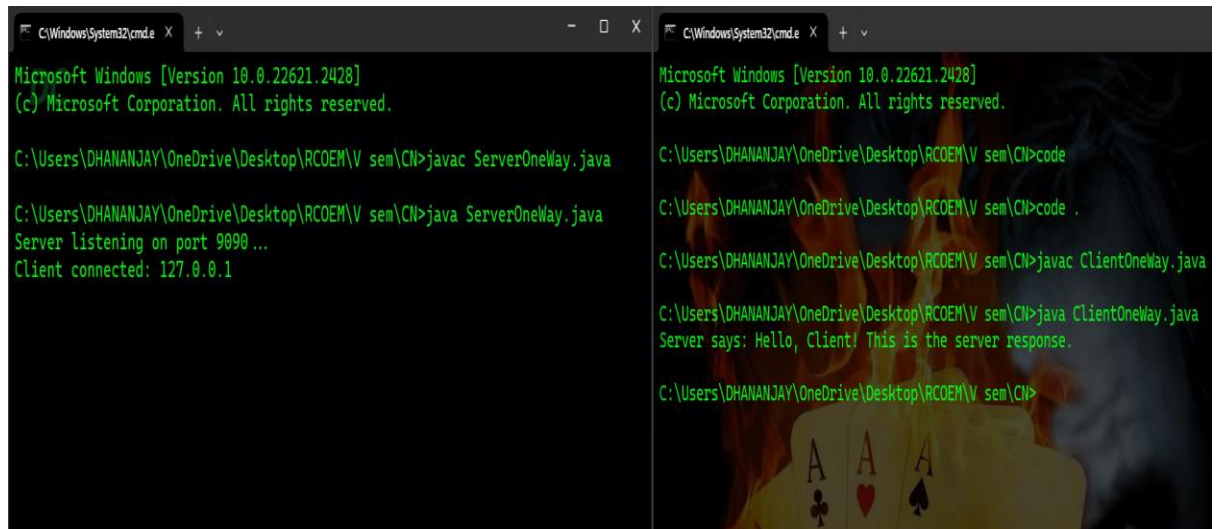
                // Close the socket and wait for the next client
                clientSocket.close();
            }
        } catch (IOException e) {
            e.printStackTrace();
        }
    }
}
```

#### **Client Side**

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

public class ClientOneWay {
    public static void main(String[] args) {
        try {
            Socket socket = new Socket("localhost", 9090);
            BufferedReader in = new BufferedReader(new
                InputStreamReader(socket.getInputStream()));
            String response = in.readLine();
            System.out.println("Server says: " + response);
            socket.close();
        } catch (IOException e) {
            e.printStackTrace();
        }
    }
}
```

## Output



```
C:\Windows\System32\cmd.exe X + v X
Microsoft Windows [Version 10.0.22621.2428]
(c) Microsoft Corporation. All rights reserved.

C:\Users\DHANANJAY\OneDrive\Desktop\RCOEM\V sem\CN>javac ServerOneWay.java

C:\Users\DHANANJAY\OneDrive\Desktop\RCOEM\V sem\CN>java ServerOneWay.java
Server listening on port 9090 ...
Client connected: 127.0.0.1
```

```
C:\Windows\System32\cmd.exe X + v X
Microsoft Windows [Version 10.0.22621.2428]
(c) Microsoft Corporation. All rights reserved.

C:\Users\DHANANJAY\OneDrive\Desktop\RCOEM\V sem\CN>code

C:\Users\DHANANJAY\OneDrive\Desktop\RCOEM\V sem\CN>code .

C:\Users\DHANANJAY\OneDrive\Desktop\RCOEM\V sem\CN>javac ClientOneWay.java

C:\Users\DHANANJAY\OneDrive\Desktop\RCOEM\V sem\CN>java ClientOneWay.java
Server says: Hello, Client! This is the server response.

C:\Users\DHANANJAY\OneDrive\Desktop\RCOEM\V sem\CN>
```

- **Two Way Communication**

#### **Server Side**

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

public class tcpServer {
    public static void main(String args[]) {
        try {
            ServerSocket ss = new ServerSocket(1559);
            System.out.println("SERVER PORT CREATED ");
            Socket sc = ss.accept();
            System.out.println("Connection Established ");
            InputStream is = sc.getInputStream();
            OutputStream os = sc.getOutputStream();
            System.out.println("STREAMS CREATED ");
            String reply = null;
            Scanner s = new Scanner(is);
            System.out.println("Reading request");
            String req = s.next();
            System.out.println("NUMBER RECIVED is: " + req);
            int num = Integer.parseInt(req);
            boolean flag = false;
            for (int i = 2; i <= num / 2; i++) {
                if (num % i == 0) {
                    flag = true;
                    break;
                }
            }
            if (flag == false) {
                reply = "It is a Prime number";
            } else {
                reply = "It is not a Prime Number";
            }
            PrintWriter pw = new PrintWriter(os, true);
            pw.println(reply);
        } catch (Exception e) {
        }
    }
}
```

#### **Client Side**

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

```

import java.util.*;

public class tcpClient {
    public static void main(String[] args) {
        try {
            Socket socket = new Socket("localhost", 1559);
            System.out.println("Connected to the server");
            Scanner sc = new Scanner(System.in);

            InputStream is = socket.getInputStream();
            OutputStream os = socket.getOutputStream();

            // Send a number to the server
            PrintWriter pw = new PrintWriter(os, true);
            System.out.println("Enter the no to check it is prime or not");
            pw.println(sc.next());

            BufferedReader br = new BufferedReader(new InputStreamReader(is));
            String response = br.readLine();
            System.out.println("Server response: " + response);

            socket.close();
        } catch (IOException e) {
            e.printStackTrace();
        }
    }
}

```

## Output

```

C:\Users\DHANANJAY\OneDrive\Desktop\RCOEM\V sem\CN>javac tcpServer.java

C:\Users\DHANANJAY\OneDrive\Desktop\RCOEM\V sem\CN>java tcpServer.java
SERVER PORT CREATED
Connection Established
STREAMS CREATED
Reading request
NUMBER RECEIVED is: 45

```

```

C:\Users\DHANANJAY\OneDrive\Desktop\RCOEM\V sem\CN>javac tcpClient.java

C:\Users\DHANANJAY\OneDrive\Desktop\RCOEM\V sem\CN>java tcpClient.java
Connected to the server
Enter the no to check it is prime or not
45
Server response: It is not a Prime Number

```

- **Two Way Communication using thread**

#### **Server Side**

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

public class TcpServerThread {
    public static void main(String args[]) {
        try {
            ServerSocket ss = new ServerSocket(1559);
            System.out.println("SERVER PORT CREATED ");

            while (true) {
                Socket sc = ss.accept();
                System.out.println("Connection Established ");

                // Create a new thread to handle the client
                ClientHandler clientHandler = new ClientHandler(sc);
                Thread thread = new Thread(clientHandler);
                thread.start();
            }
        } catch (IOException e) {
            e.printStackTrace();
        }
    }
}

class ClientHandler implements Runnable {
    private Socket socket;

    public ClientHandler(Socket socket) {
        this.socket = socket;
    }

    public void run() {
        try {
            InputStream is = socket.getInputStream();
            OutputStream os = socket.getOutputStream();
            System.out.println("STREAMS CREATED ");
            String reply = null;
            Scanner s = new Scanner(is);
            System.out.println("Reading request");
            String req = s.next();
            System.out.println("NUMBER RECEIVED is: " + req);
        }
    }
}
```

```

int num = Integer.parseInt(req);
boolean flag = false;
for (int i = 2; i <= num / 2; i++) {
    if (num % i == 0) {
        flag = true;
        break;
    }
}
if (flag == false) {
    reply = "It is a Prime number";
} else {
    reply = "It is not a Prime Number";
}
PrintWriter pw = new PrintWriter(os, true);
pw.println(reply);

// Close the socket after processing client request
socket.close();
} catch (IOException e) {
    e.printStackTrace();
}
}
}

```

#### **Client Side**

```

import java.io.*;
import java.net.*;
import java.util.*;

public class TcpClientThread {
    public static void main(String[] args) {
        try {
            Socket socket = new Socket("localhost", 1559);
            System.out.println("Connected to the server");

            Scanner sc = new Scanner(System.in);
            System.out.println("Enter the number to check if it is prime or not:");
            int number = sc.nextInt();

            // Send number to the server using a separate thread
            Thread senderThread = new Thread(new Sender(socket, number));
            senderThread.start();

            // Receive response from the server
            Thread receiverThread = new Thread(new Receiver(socket));
            receiverThread.start();
        } catch (IOException e) {
            e.printStackTrace();
        }
    }
}

```

```
}  
}
```

```
class Sender implements Runnable {
```

```
    private Socket socket;  
    private int number;
```

```
    public Sender(Socket socket, int number) {  
        this.socket = socket;  
        this.number = number;  
    }
```

```
    public void run() {  
        try {  
            OutputStream os = socket.getOutputStream();  
            PrintWriter pw = new PrintWriter(os, true);  
            pw.println(number);  
        } catch (IOException e) {  
            e.printStackTrace();  
        }  
    }  
}
```

```
class Receiver implements Runnable {
```

```
    private Socket socket;
```

```
    public Receiver(Socket socket) {  
        this.socket = socket;  
    }
```

```
    public void run() {  
        try {  
            InputStream is = socket.getInputStream();  
            BufferedReader br = new BufferedReader(new InputStreamReader(is));  
            String response = br.readLine();  
            System.out.println("Server response: " + response);  
        } catch (IOException e) {  
            e.printStackTrace();  
        }  
    }  
}
```

## Output

```
C:\Users\DHANANJAY\OneDrive\Desktop\RCOEM\V sem\CN>javac TcpServerThread.java

C:\Users\DHANANJAY\OneDrive\Desktop\RCOEM\V sem\CN>java TcpServerThread.java
SERVER PORT CREATED
Connection Established
STREAMS CREATED
Reading request
NUMBER RECEIVED is: 23
Connection Established
STREAMS CREATED
Reading request
NUMBER RECEIVED is: 24
|
```

```
C:\Users\DHANANJAY\OneDrive\Desktop\RCOEM\V sem\CN>javac TcpClientThread.java

C:\Users\DHANANJAY\OneDrive\Desktop\RCOEM\V sem\CN>java TcpClientThread.java
Connected to the server
Enter the number to check if it is prime or not:
23
Server response: It is a Prime number
D is: 23
C:\Users\DHANANJAY\OneDrive\Desktop\RCOEM\V sem\CN>java TcpClientThread.java
Connected to the server
Enter the number to check if it is prime or not:
24
Server response: It is not a Prime Number
```



- **File Transfer using Socket programming**

**Server Side**

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

public class FileServer {
    public static void main(String[] args) {
        // define the port
        int port = 9090;
        String filename = "Send.txt";

        try (ServerSocket serverSocket = new ServerSocket(port);
            Socket socket = serverSocket.accept();
            FileInputStream fileInputStream = new FileInputStream(filename);
            OutputStream outputStream = socket.getOutputStream()) {

            byte[] buffer = new byte[4096];
            int bytesRead;

            while ((bytesRead = fileInputStream.read(buffer)) != -1) {
                outputStream.write(buffer, 0, bytesRead);
            }

            System.out.println("File " + filename + " sent to client.");

        } catch (IOException e) {
            e.printStackTrace();
        }
    }
}
```

**Client Side**

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

public class FileClient {
    public static void main(String[] args) {
        String serverIP = "127.0.0.1";
        int port = 9090;
        String saveFilePath = "received.txt";

        try (Socket socket = new Socket(serverIP, port);
            InputStream inputStream = socket.getInputStream();
            FileOutputStream fileOutputStream = new FileOutputStream(saveFilePath))
        {

            byte[] buffer = new byte[4096];
            int bytesRead;
```

```

        while ((bytesRead = inputStream.read(buffer)) != -1) {
            fileOutputStream.write(buffer, 0, bytesRead);
        }

        System.out.println("File received and saved as " + saveFilePath);

    } catch (IOException e) {
        e.printStackTrace();
    }
}
}

```

### Output

```

C:\Users\DHANANJAY\OneDrive\Desktop\RCOEM\V sem\CN>javac FileServer.java

C:\Users\DHANANJAY\OneDrive\Desktop\RCOEM\V sem\CN>java FileServer.java
File Send.txt sent to client.

```

```

C:\Users\DHANANJAY\OneDrive\Desktop\RCOEM\V sem\CN>javac FileClient.java

C:\Users\DHANANJAY\OneDrive\Desktop\RCOEM\V sem\CN>java FileClient.java
File received and saved as received.txt

```

