

Ex 3:

Program:

Echo Server:

```
package computernetworks;

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

public class EchoServer {

    public static void main(String[] args) throws IOException {

        ServerSocket serverSocket = new ServerSocket(5000);

        System.out.println("Server started. Waiting for client...");

        Socket clientSocket = serverSocket.accept();

        System.out.println("Client connected.");

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

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

        String inputLine;

        while ((inputLine = in.readLine()) != null) {

            System.out.println("Received: " + inputLine);

            out.println("Echo: " + inputLine); // Echo back to client

            if ("bye".equalsIgnoreCase(inputLine)) break;

        }

        in.close();

        out.close();

        clientSocket.close();

        serverSocket.close();

    }

}
```

Output:

Server started. Waiting for client...

Echo Client:

```
package computernetworks;

import java.io.*;

import java.net.*;

public class EchoClient {

    public static void main(String[] args) throws IOException {

        Socket socket = new Socket("localhost", 5000);

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

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

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

        String input;

        System.out.println("Type messages to send (type 'bye' to quit):");

        while ((input = userInput.readLine()) != null) {

            out.println(input);

            System.out.println("Server replied: " + in.readLine());

            if ("bye".equalsIgnoreCase(input)) break;

        }

        in.close();

        out.close();

        socket.close();

    }

}
```

Output:

Type messages to send (type 'bye' to quit):

hello

Server replied: Echo: hello

bye

Server replied: Echo: bye

Chat Server:

```
// ChatServer.java

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

public class ChatServer {

    public static void main(String[] args) throws IOException {

        ServerSocket serverSocket = new ServerSocket(6000);

        System.out.println("Chat Server started...");

        Socket socket = serverSocket.accept();

        System.out.println("Client connected!");

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

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

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

        String clientMsg, serverMsg;

        while (true) {

            clientMsg = in.readLine();

            if (clientMsg.equalsIgnoreCase("bye")) break;

            System.out.println("Client: " + clientMsg);

            System.out.print("You: ");

            serverMsg = keyboard.readLine();

            out.println(serverMsg);

            if (serverMsg.equalsIgnoreCase("bye")) break;

        }

        in.close();

        out.close();

        socket.close();

        serverSocket.close();

    }

}
```

Output:

Server started. Waiting for client...

Client connected.

Received: Hello

Received: bye

Chat Client:

```
// ChatClient.java
```

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

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

```
public class ChatClient {
```

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

```
        Socket socket = new Socket("localhost", 6000);
```

```
        System.out.println("Connected to server.");
```

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

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

```
        BufferedReader keyboard = new BufferedReader(new InputStreamReader(System.in));
```

```
        String serverMsg, clientMsg;
```

```
        while (true) {
```

```
            System.out.print("You: ");
```

```
            clientMsg = keyboard.readLine();
```

```
            out.println(clientMsg);
```

```
            if (clientMsg.equalsIgnoreCase("bye")) break;
```

```
            serverMsg = in.readLine();
```

```
            if (serverMsg.equalsIgnoreCase("bye")) break;
```

```
            System.out.println("Server: " + serverMsg);
```

```
    }  
  
    in.close();  
    out.close();  
    socket.close();  
}  
}
```

Output:

Connected to server.

You: Hi!

Server: Hello!

You: How are you?

Server: I'm good.

You: bye