1. **write a program to show how client and server interact, use java programming language to develop the application(client-server application)**

Server Code

**import java.io.\*;**

**import java.net.\*;**

**public class SimpleServer {**

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

**try (ServerSocket serverSocket = new ServerSocket(12345)) {**

**System.out.println("Server is listening on port 12345");**

**while (true) {**

**Socket socket = serverSocket.accept();**

**System.out.println("New client connected");**

**// Create a new thread for each client**

**new Thread(new ClientHandler(socket)).start();**

**}**

**} catch (IOException e) {**

**e.printStackTrace();**

**}**

**}**

**}**

**class ClientHandler implements Runnable {**

**private Socket socket;**

**public ClientHandler(Socket socket) {**

**this.socket = socket;**

**}**

**@Override**

**public void run() {**

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

**PrintWriter out = new PrintWriter(socket.getOutputStream(), true)) {**

**String message;**

**while ((message = in.readLine()) != null) {**

**System.out.println("Received from client: " + message);**

**out.println("Echo: " + message); // Echo back to the client**

**}**

**} catch (IOException e) {**

**e.printStackTrace();**

**} finally {**

**try {**

**socket.close();**

**} catch (IOException e) {**

**e.printStackTrace();**

**}**

**}**

**}**

**}**

Client Code

**import java.io.\*;**

**import java.net.\*;**

**public class SimpleClient {**

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

**try (Socket socket = new Socket("localhost", 12345);**

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

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

**BufferedReader stdIn = new BufferedReader(new InputStreamReader(System.in))) {**

**String userInput;**

**System.out.println("Connected to server. Type messages to send:");**

**while ((userInput = stdIn.readLine()) != null) {**

**out.println(userInput);**

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

**}**

**} catch (IOException e) {**

**e.printStackTrace();**

**}**

**}**

**}**

**How to run the application:**

1. **run the server**
2. **Run the client**
3. **Test the interaction:** Type messages in the client terminal and observe the server responding with echoed messages.