

ECHO server:

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

public class EchoServer {
    public static void main(String[] args) {
        int port = 12345;
        try (ServerSocket serverSocket = new ServerSocket(port)) {
            System.out.println("Echo Server started. Listening on port " + port);
            while (true) {
                Socket clientSocket = serverSocket.accept();
                System.out.println("Client connected: " + clientSocket.getInetAddress());
                handleClient(clientSocket);
            }
        } catch (IOException e) {
            e.printStackTrace();
        }
    }

    private static void handleClient(Socket clientSocket) {
        try (
            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 from client: " + inputLine);
                out.println("Echo: " + inputLine);

                if ("bye".equalsIgnoreCase(inputLine.trim())) {
                    System.out.println("Client requested to end connection.");
                    break;
                }
            }
        }
    }
}
```

```
        }  
    }  
    } catch (IOException e) {  
        e.printStackTrace();  
    } finally {  
        try {  
            clientSocket.close();  
        } catch (IOException e) {  
            e.printStackTrace();  
        }  
    }  
}
```

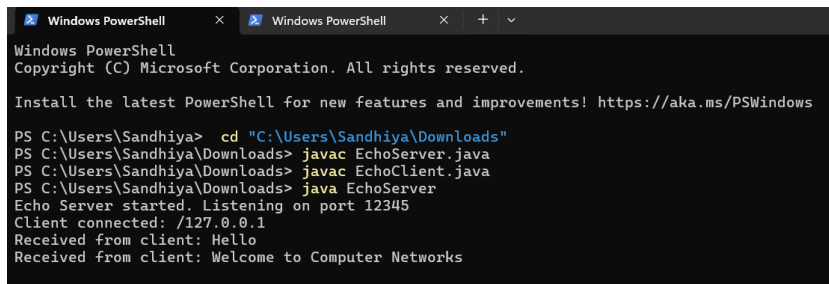
ECHO Client:

```
import java.io.*;  
import java.net.*;  
public class EchoClient {  
    public static void main(String[] args) {  
        String serverAddress = "localhost";  
        int port = 12345;  
        try (  
            Socket socket = new Socket(serverAddress, port);  
            BufferedReader consoleReader = new BufferedReader(new  
InputStreamReader(System.in));  
            PrintWriter out = new PrintWriter(socket.getOutputStream(), true);  
            BufferedReader in = new BufferedReader(new  
InputStreamReader(socket.getInputStream()));  
        ) {  
            System.out.println("Connected to server at " + serverAddress + ":" + port);  
            String userInput;  
            while (true) {
```

```

        System.out.print("Enter message (type 'bye' to quit): ");
        userInput = consoleReader.readLine();
        if (userInput == null || userInput.trim().equalsIgnoreCase("bye")) {
            out.println("bye");
            break;
        }
        out.println(userInput);
        String response = in.readLine();
        System.out.println("Server replied: " + response);
    }
    System.out.println("Client exiting.");
} catch (IOException e) {
    e.printStackTrace();
}
}
}

```

Output:


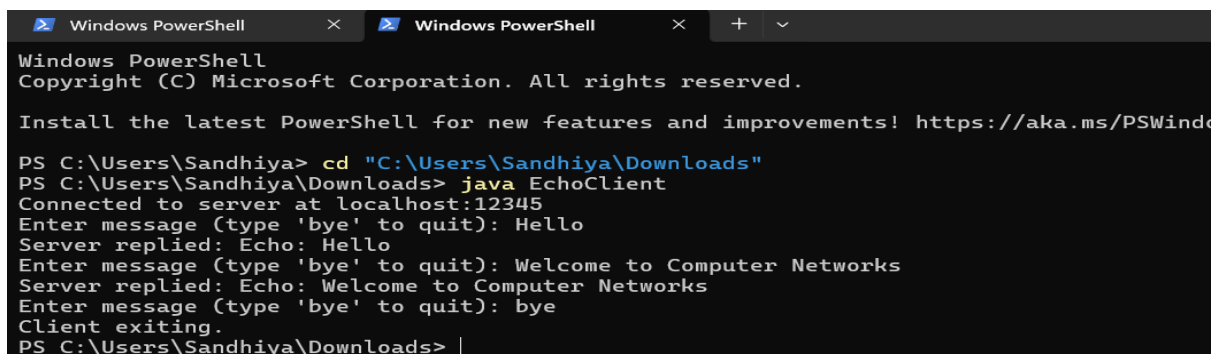
```

Windows PowerShell
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PS C:\Users\Sandhiya> cd "C:\Users\Sandhiya\Downloads"
PS C:\Users\Sandhiya\Downloads> javac EchoServer.java
PS C:\Users\Sandhiya\Downloads> javac EchoClient.java
PS C:\Users\Sandhiya\Downloads> java EchoServer
Echo Server started. Listening on port 12345
Client connected: /127.0.0.1
Received from client: Hello
Received from client: Welcome to Computer Networks

```



```

Windows PowerShell
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PS C:\Users\Sandhiya> cd "C:\Users\Sandhiya\Downloads"
PS C:\Users\Sandhiya\Downloads> java EchoClient
Connected to server at localhost:12345
Enter message (type 'bye' to quit): Hello
Server replied: Echo: Hello
Enter message (type 'bye' to quit): Welcome to Computer Networks
Server replied: Echo: Welcome to Computer Networks
Enter message (type 'bye' to quit): bye
Client exiting.
PS C:\Users\Sandhiya\Downloads> |

```