

Java Networking and Socket Programming

Objective: Write a Java program that simulates a simple client-server architecture.

Requirements:

- Create a new Java class that represents a client.
- Create a new Java class that represents a server.
- Use sockets to establish a connection between the client and server.

Optional/Bonus Exercises:

- Write a Java program that simulates a simple file transfer protocol (FTP) client and server.
- Write a Java program that simulates a simple web server.

Hint: Here is an example code snippet to get you started:

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

public class Server {
    public static void main(String[] args) {
        try (ServerSocket serverSocket = new ServerSocket(12345)) {
            System.out.println("Server is listening on port 12345");
            Socket socket = serverSocket.accept();
            System.out.println("Client connected");

            InputStream input = socket.getInputStream();
            BufferedReader reader =
                new BufferedReader(new InputStreamReader(input));

            OutputStream output = socket.getOutputStream();
            PrintWriter writer = new PrintWriter(output, true);

            String text;
            while ((text = reader.readLine()) != null) {
                System.out.println("Received: " + text);
                writer.println("Echo: " + text);
            }
        } catch (IOException ex) {
            ex.printStackTrace();
        }
    }
}

// Client.java
import java.io.*;
```

```

import java.net.*;

public class Client {
    public static void main(String[] args) {
        String hostname = "localhost";
        int port = 12345;

        try (Socket socket = new Socket(hostname, port)) {
            OutputStream output = socket.getOutputStream();
            PrintWriter writer = new PrintWriter(output, true);

            InputStream input = socket.getInputStream();
            BufferedReader reader =
                new BufferedReader(new InputStreamReader(input));

            BufferedReader consoleReader =
                new BufferedReader(new InputStreamReader(System.in));
            String text;
            while ((text = consoleReader.readLine()) != null) {
                writer.println(text);
                String response = reader.readLine();
                System.out.println(response);
            }
        } catch (UnknownHostException ex) {
            System.out.println("Server not found: " + ex.getMessage());
        } catch (IOException ex) {
            System.out.println("I/O error: " + ex.getMessage());
        }
    }
}

```