# cse15l-lab-reports

# Lab Report 2

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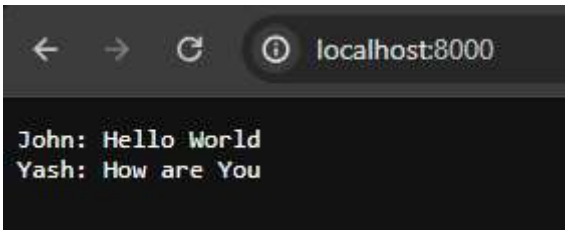
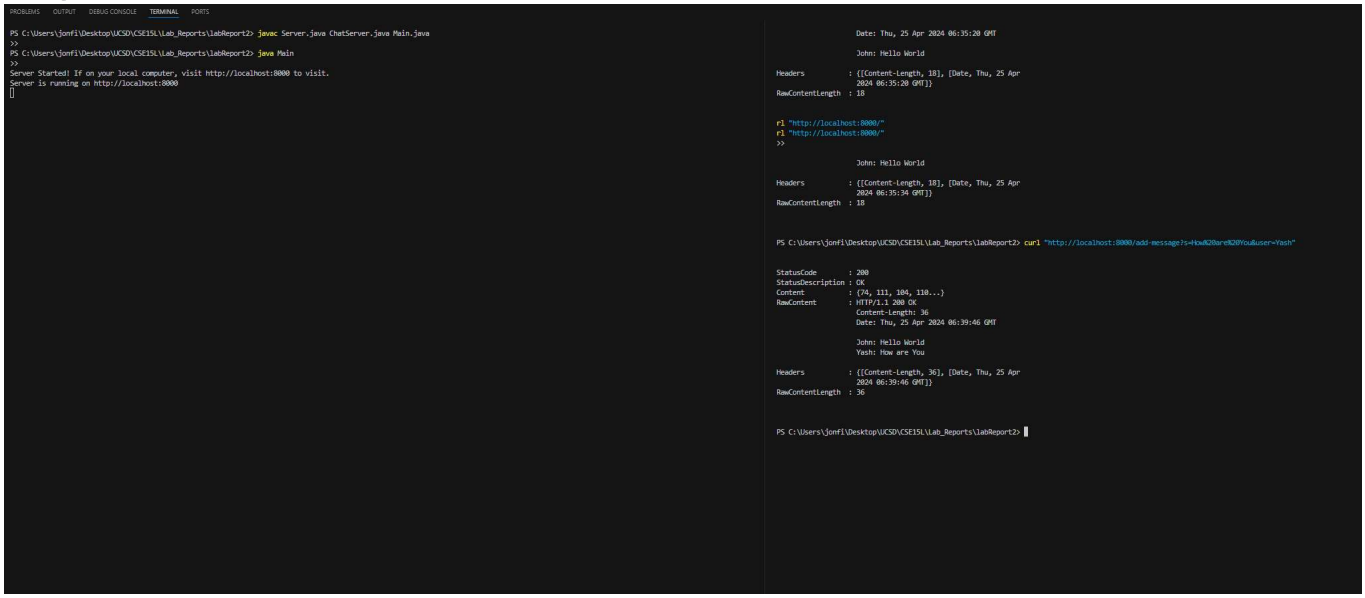
## Introduction

For this week's lab, we focues on learning about ChatServers and hosting them.

## Part I

- image: 

- image: 

- image:

```
Welcome   Server.java   Main.java   ChatServer.java ×
ChatServer.java > ChatServer
import java.net.URI;
import java.net.URLDecoder;
import java.util.ArrayList;


class ChatServer implements URLHandler {
    private ArrayList<String> messages = new ArrayList<>();  // Store messages


    public String handleRequest(URI uri) {
        try {
            String response = "";
            String path = uri.getPath();  // Get the path from the URI

            if (path.equals(anObject:"/add-message")) {
                String query = uri.getQuery();  // Get the query from the URI
                String[] params = query.split(regex:"&");  // Split parameters by '&'

                String message = "";
                String user = "";

                // Loop through each parameter to find 's' and 'user' values
                for (String param : params) {
                    String[] keyValue = param.split(regex:"=");  // Split each parameter into key-value pairs

                    if (keyValue[0].equals(anObject:"s")) {
                        message = URLDecoder.decode(keyValue[1], enc:"UTF-8");  // Decode the message
                    } else if (keyValue[0].equals(anObject:"user")) {
                        user = URLDecoder.decode(keyValue[1], enc:"UTF-8");  // Decode the user
                    }
                }

                // Format and add the message to the list
                messages.add(user + ": " + message);

                // Create a response containing all messages
                for (String msg : messages) {
                    response += msg + "\n";
                }
            } else {
                // If no specific action is found, show all messages
                for (String msg : messages) {
                    response += msg + "\n";
                }
            }
            return response;  // Return the formatted response
        } catch (Exception e) {
            return "Error processing request: " + e.getMessage();
        }
    }
}
```

## Example 1: Adding a Message

- Request: A user accesses the URL http://localhost:8000/add-message?s=Hello%20World&user=John.

### Which methods in your code are called?

- handleRequest(URI uri) from the ChatServer class.

  **What are the relevant arguments to those methods, and the values of any relevant fields of the class?**

- Arguments:
  - URI uri: An object representing the URI accessed, which in this case would be something like URI("http://localhost:8000/add-message?s=Hello%20World&user=John").
- Values: ArrayList messages: This field holds the chat messages. Before this request, let's assume it's empty ([]).

  **How do the values of any relevant fields of the class change from this specific request?**

- The messages ArrayList initially is empty. After processing this request where the user "John" says "Hello World", the ArrayList will have one element: Before: [] After: ["John: Hello World"]

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## Example 2: Viewing Messages

- Request: Another request is made to the URL http://localhost:8000/ just to view messages.

**Which methods in your code are called?**

handleRequest(URI uri) from the ChatServer class.

**What are the relevant arguments to those methods, and the values of any relevant fields of the class?**

- Arguments: URI uri: An object representing the URI accessed, which in this case would be URI("http://localhost:8000/").
- Values: ArrayList messages: Holds the chat messages, which now contains ["John: Hello World"].

  **How do the values of any relevant fields of the class change from this specific request?**

- The messages ArrayList does not change because this request is only viewing the messages. Therefore, the state of messages remains: Before and After: ["John: Hello World"] Explanation
- handleRequest Method: It checks the path of the URI and either adds to the messages ArrayList or simply formats the existing messages for display. When adding a message, it parses the query string, decodes parameters, and constructs the message string to add to messages. When viewing messages, it constructs a response string from the current contents of messages without modifying it. —

## Part II

#### `ls` with the absolute path to the private key for your SSH key for logging into ieng6

```
PS C:\Users\jonfi> ls C:\Users\jonfi\.ssh\id_rsa


    Directory: C:\Users\jonfi\.ssh


Mode                LastWriteTime         Length Name
----                -------------         ------ ----
-a----        4/16/2024   9:28 AM           2655 id_rsa


PS C:\Users\jonfi>
```

**On the command line of the ieng6 machine, run `ls` with the absolute path to the public key for your SSH key for logging into ieng6**

```
[j6fisher@ieng6-203]:~:516$ ls
Desktop  Documents  Downloads  Music  Pictures  Public  Templates  Videos  hello.txt  perl5  wavelet
[j6fisher@ieng6-203]:~:517$ ls /home/linux/ieng6/oce/37/j6fisher/.ssh/authorized_keys
/home/linux/ieng6/oce/37/j6fisher/.ssh/authorized_keys
[j6fisher@ieng6-203]:~:518$ ls -a /home/linux/ieng6/oce/37/j6fisher/.ssh/authorized_keys
/home/linux/ieng6/oce/37/j6fisher/.ssh/authorized_keys
[j6fisher@ieng6-203]:~:519$
```

—

## Part III: Things I learned in weeks 2 and 3

**Understanding URLs and Servers:**

- Learned about the structure and function of URLs in web development. Gained practical experience in setting up and running a web server using Java, specifically handling HTTP requests and responses.

**Remote Server Connection:**

- Practiced remotely connecting to a CSE15L account using SSH, familiarizing with the process and potential security prompts. Understood the significance of the RSA key fingerprint and the security implications of accepting it.

**Building a Simple Web Server:**

- Implemented a basic web server that can handle specific URL paths and query parameters. Explored the interaction between client requests and server responses through a simple number

managing system.