cse15l-lab-reports

Part 1: ChatServer

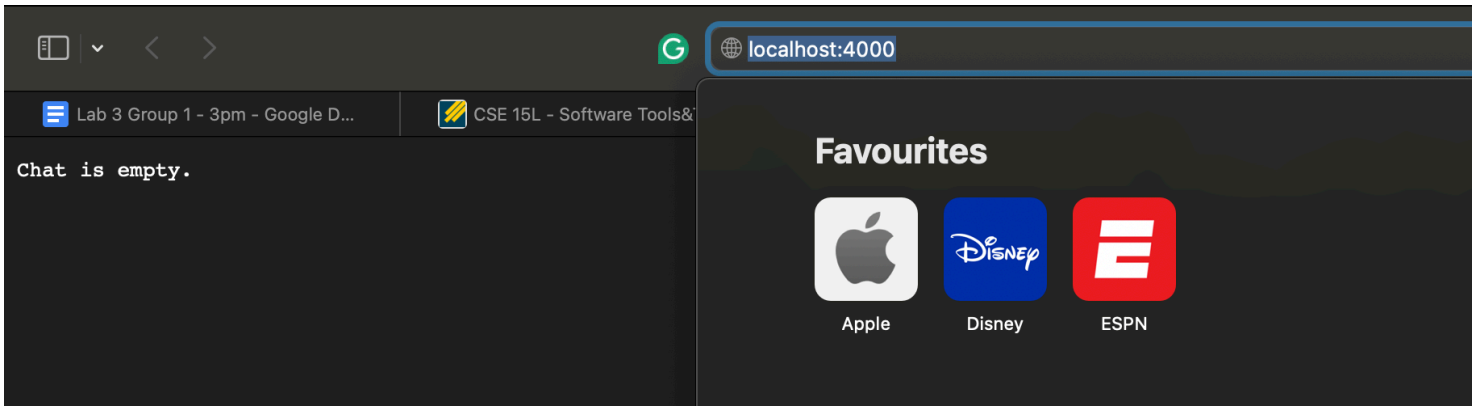
ChatServer.java Code

```
import java.io.IOException;
import java.net.URI;


class Handler implements URLHandler {
    private StringBuilder chatLog = new StringBuilder();


    public String handleRequest(URI url) {
        if (url.getPath().equals("/")) {
            return chatLog.length() == 0 ? "Chat is empty." : chatLog.toString();
        } else if (url.getPath().equals("/add-message")) {
            String query = url.getQuery();
            String user = null;
            String message = null;
            for (String param : query.split("&")) {
                String[] entry = param.split("=");
                if (entry.length > 1) {
                    if (entry[0].equals("user")) {
                        user = entry[1];
                    } else if (entry[0].equals("s")) {
                        message = entry[1];
                    }
                }
            }
            if (user != null && message != null) {
                chatLog.append(user).append(": ").append(message).append("\n");
                return chatLog.toString();
            } else {
                return "Invalid request! Parameters 's' and 'user' are required.";
            }
        }
        return "404 Not Found!";
```

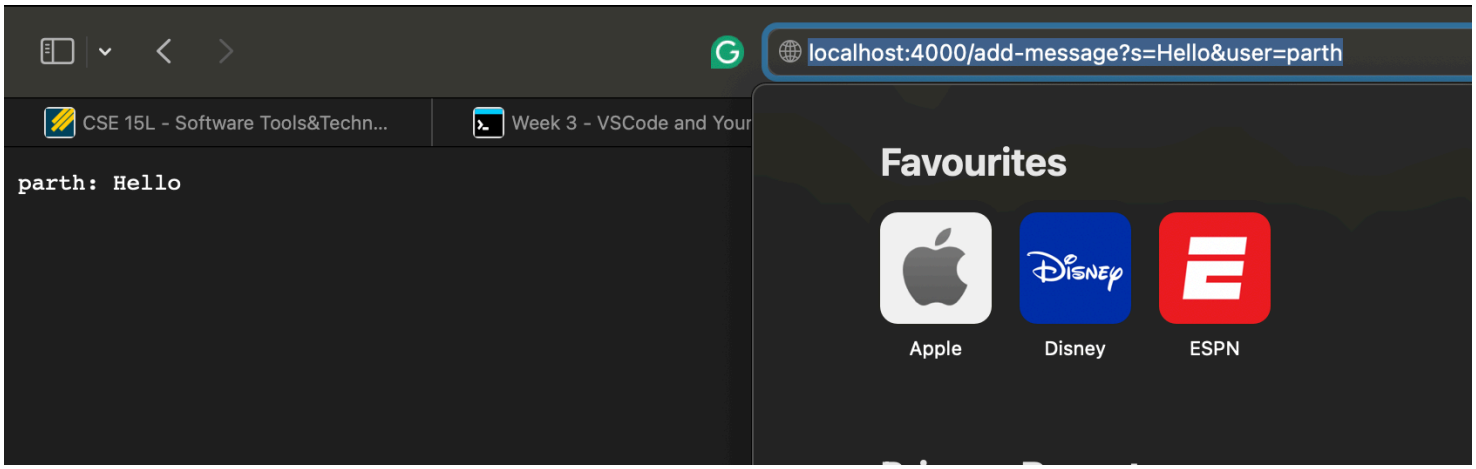
```
        }
    }


    class ChatServer {
        public static void main(String[] args) throws IOException {
            if (args.length == 0) {
                System.out.println("Missing port number! Try any number between 1024 t
                return;
            }
            int port = Integer.parseInt(args[0]);
            Server.start(port, new Handler());
        }
    }
```

Demo

Before:



After:



Methods Called: handleRequest(URI url) - The URL from the request is parsed to determine the path and query parameters.

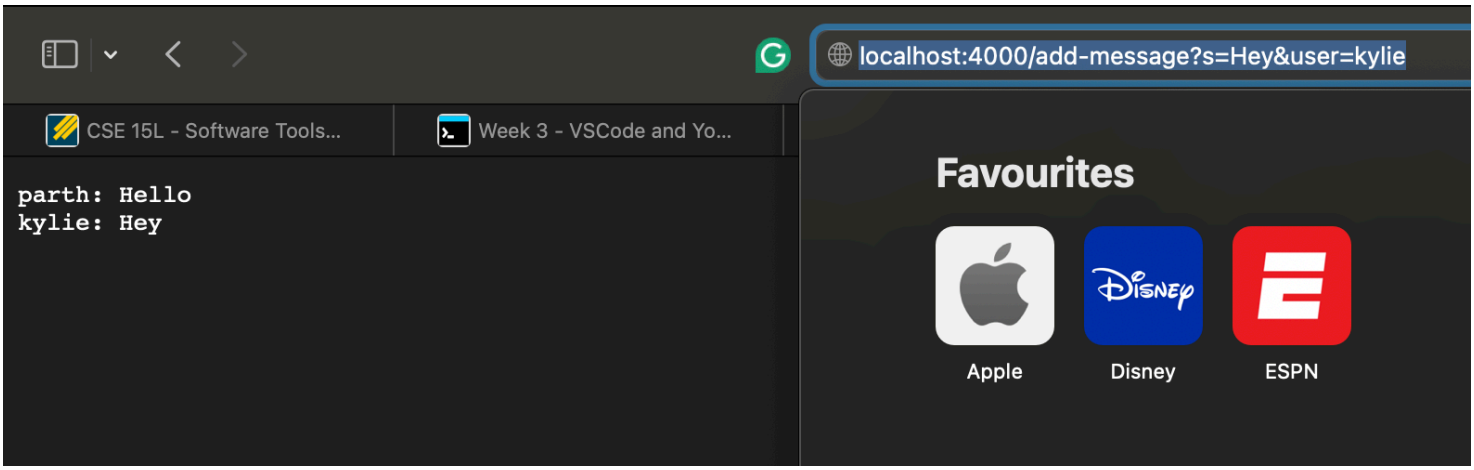
Arguments and Values of Fields

- url (URI): An instance of `URI`, representing the URL `http://localhost:4000/add-message?s=Hello&user=parth`.
- chatLog (StringBuilder): This field in the `Handler` class is used to accumulate chat messages as they are received. Initially, it is an empty `StringBuilder`.

How Field Values Change Here is the flow and changes in the field values step-by-step, given the request `http://localhost:4000/add-message?s=Hello&user=parth`:

1. Checking the path:
   - The `getPath()` method on the `URI` instance returns `/add-message`, matching one of the conditions in `handleRequest`.
2. Parsing the Query:
   - The getQuery() method on the URI instance returns the string `"s=Hello&user=parth"`.
   - The query string is split into parameters: `["s=Hello", "user=parth"]`.
   - Each parameter is further split into key-value pairs: `["s", "Hello"]` and `["user", "parth"]`.
3. Extracting Parameters:
   - From the splits, `user` is assigned the value `"parth"` and `message` is assigned `"Hello"`.
4. Appending to chatLog:
   - Given both `user` and `message` are non-null, the message `"parth: Hello\n"` is appended to `chatLog`.
   - Before the request, `chatLog` was an empty `StringBuilder`. After the request, it contains the string `"parth: Hello\n"`.

2nd Screenshot



Methods Called: handleRequest(URI url) - This method is called again when the new request arrives. The purpose remains to parse the URI and handle the request based on its path and parameters.

Arguments and Values of Fields

- url (URI): Represents the URL `http://localhost:4000/add-message?s=Hey&user=kylie`.
- chatLog (StringBuilder): Before this request, `chatLog` contained `"parth: Hello\n"`.

How Field Values Change

1. Checking the Path:
   - The `getPath()` method on the URI returns `/add-message`, which matches the corresponding condition in `handleRequest`.
2. Parsing the Query:
   - The `getQuery()` returns `"s=Hey&user=kylie"`.
   - The string is split into parameters: `["s=Hey", "user=kylie"]`.
   - These are then split into key-value pairs: `["s", "Hey"]` and `["user", "kylie"]`.
3. Extracting Parameters:
   - `user` is assigned the value `"kylie"` and `message` is assigned `"Hey"`.
4. Appending to chatLog:
   - The `chatLog` already contains `"parth: Hello\n"`. After extracting the parameters, the new message `"kylie: Hey\n"` is appended.
   - Therefore, `chatLog` changes from `"parth: Hello\n"` to `"parth: Hello\nkylie: Hey\n"`.

Part 2: SSH and Remote Servers

Path to Private Key on local device

```
[parthshinde@Parths-MacBook-Air-3 ~ % ls ~/.ssh
 config          id_ed25519.pub  known_hosts
 id_ed25519      id_rsa          known_hosts.old
[parthshinde@Parths-MacBook-Air-3 ~ % ls ~/.ssh/id_ed25519
 /Users/parthshinde/.ssh/id_ed25519
```

Path to Public Key on ieng6 device

```
[[pshinde@ieng6-202]:~:11$ ls .ssh/authorized_keys
 .ssh/authorized_keys
 [pshinde@ieng6-202]:~:12$
```

Logging into ieng6 without a Password

```
Last login: Mon Apr 22 13:33:33 on ttys002
[parthshinde@Parths-MacBook-Air-3 ~ % ssh pshinde@ieng6.ucsd.edu
Last login: Mon Apr 22 13:40:51 2024 from 100.83.41.80
quota: Cannot resolve mountpoint path /home/linux/staff/.snapshot/daily.2024-04-02_0010: Stale file handle
quota: Cannot resolve mountpoint path /home/linux/staff/.snapshot/hourly.2024-04-05_0801: Stale file handle
Hello pshinde, you are currently logged into ieng6-202.ucsd.edu

You are using 0% CPU on this system

Cluster Status
Hostname     Time    #Users  Load  Averages
ieng6-201   13:45:01   14  1.17,  0.68,  0.61
ieng6-202   13:45:01   12  0.28,  0.35,  0.29
ieng6-203   13:45:01   9   1.85,  1.71,  1.50



To begin work for one of your courses [ cs15lsp24 ], type its name
at the command prompt.  (For example, "cs15lsp24", without the quotes).

To see all available software packages, type "prep -l" at the command prompt,
or "prep -h" for more options.
[pshinde@ieng6-202]:~:14$
```

Part 3: Reflection

In week 2 I learned how to log into a remote server using `ssh` and how to download things from an URL using `curl`. I also learned about starting and running servers. In week 3, I learned about private/public keys and how they could be use to login without requiring passwords.