

# COMP 4981

## Assignment 1

### Testing

Wilson Sue & Roy Xavier Pimentel

A01266055 & A00697839

Feb 4th, 2024

<b>Features</b>	<b>3</b>
Connection Handling	3
Receiving GET, HEAD, POST requests	3
Processing GET, HEAD, POST requests	3
Database Integration	3
<b>Test Results</b>	<b>4</b>
General Usage	4
<b>Stress Testing</b>	<b>6</b>
Examples found below	6
<b>Examples</b>	<b>7</b>
Browser Compatibility Test Part 1   Multi Browser connected:	7
Browser Compatibility Test Part 2:	8
Multi-Client disconnect	9
Multi Post connected	9

# Features

## Connection Handling

The server accepts incoming connections using `accept()`. It can handle multiple clients simultaneously up to a defined limit (`MAX_CLIENTS`).

## Receiving GET, HEAD, POST requests

The server reads data sent by clients into a buffer and processes it based on the request type. It specifically looks for "GET", "POST", and "HEAD" requests to determine how to respond.

## Processing GET, HEAD, POST requests

When a GET request is detected, the server retrieves the requested file from the specified webroot directory and sends it back to the client. If the requested file is not found, the server attempts to open a `404.html` file to inform the client that the requested resource could not be found.

For "POST" requests, particularly to the `"/submit"` path, the server parses the body of the request to process the data sent by clients. It demonstrates basic handling of content length and body data extraction.

## Database Integration

- Within the POST branch, there's an attempt to interact with a database using `openDatabase`
- POST data is extracted
- Using the POST data `storeStringInDB` that overwrites the data while attaching a generic key
- Then `readStringFromDB` is called to read that string and attach it to the response

For "HEAD" requests, it attempts to provide headers similar to a "GET" request but without the body content, suitable for clients that need resource metadata without transferring the resource itself.

# Test Results

## General Usage

Command	Purpose	Status
<a href="#">START SERVER</a> (link)		
./server	This defaults to localhost:8080	Passed
./server <server_IP> <PORT>	Initializes and starts server to specified IP and PORT	Passed
<a href="#">GET request from Browser</a> (link)		
FROM BROWSER: <server_IP>:<PORT>	To handle a GET request input which redirects to index.html	Passed
<server_IP>:<PORT>/index.html	To handle a GET request to reach the homepage	Passed
<server_IP>:<PORT> / <HTMLfile>	To handle a GET request and access an explicit HTML added to webroot	Passed
127.0.0.1:8080 OR http://localhost:8080/	Input url on browser if default ./server was run	Passed
<a href="#">GET from curl</a> (link)		
curl -O http://localhost:8080	Runs a POST request from terminal for localhost	Passed
curl -O <server_IP> : <PORT>	Runs a POST request from terminal for server_IP	Passed
GET from wget		Passed
wget <server_IP>:<PORT>	Get command to go to the homepage	Passed
<a href="#">POST with curl</a> (link)		

curl -X POST localhost:8080/submit -d "String" OR curl -X POST 127.0.0.1:8080/submit -d "String"	POST request with localhost	Passed
curl -X POST <server_IP>:<PORT>/submit -d "String"	POST request with server_IP	Passed
<a href="#"><u>POST with wget</u></a> (link)		
wget --post-data "String" localhost:8080/submit OR wget --post-data "String" 127.0.0.1:8080/submit	POST request with localhost	Passed
wget --post-data "String" <server_IP>:<PORT>/submit	Post request with server_IP	Passed
<a href="#"><u>HEAD with curl and wget</u></a> (link)		
curl -I <server_IP>:<PORT>/index.html	HEAD Request with curl	Passed
wget --spider --server-response <server_IP>:<PORT>/index.html	HEAD Request with wget	Passed
<a href="#"><u>Quitting Server or client</u></a> (link)		
ctrl-c	Quit from either any Client or Server connection	Passed

# Stress Testing(NOT DONE LAST PART)

Examples found below

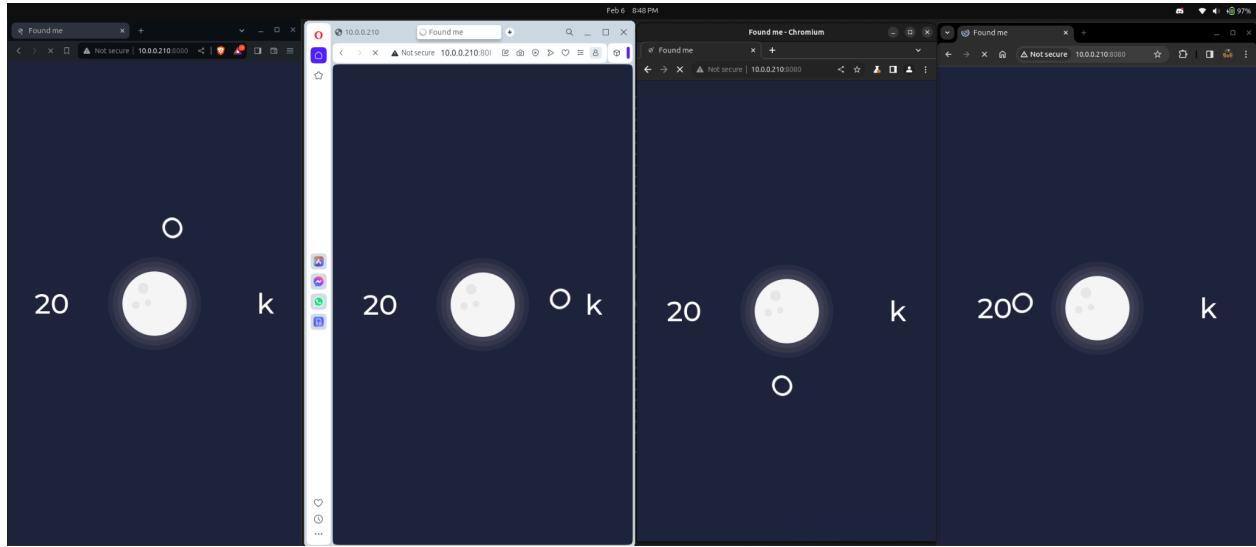
Test Case	Purpose	Status	Example
Browser Compatablitiy Test: 1. Chrome 2. Brave 3. Opera 4. Chromium 5. Edge Extra tests 6. Edge mobile (android/ios) 7. Chrome mobile (android)	Testing compatibility of GET calls from multiple browsers	passed	<a href="#">Link</a>
Multi Browser connected	Test Multiple browsers can connect via get and stay on	passed	<a href="#">Link</a>
Multi-Client disconnect	Test Multiple browsers connected can disconnect gracefully even in random order of disconnect	passed	<a href="#">Link</a>
Multi Post connected	Testing variable length and string test case for multiple posts sent to the same server. Make sure db contents overwritten	passed	<a href="#">Link</a>
Multi OS test Ubuntu Manjaro Fedora	Test if server.c can compile and run in different operating systems	passed	<a href="#">Link</a>
Subdirectory access: <IP_addr>:<PORT>/sub_dir/ sub.html	Ability to add any amount of HTML with subdirectories in server /webroot and become accessible to GET requests	passed	<a href="#">Link</a>
404 File not found redirect	Ability to redirect to custom 404.html when no file found	passed	<a href="#">Link</a>



# Examples

Browser Compatibility Test Part 1 | Multi Browser connected | Ubuntu:

In order : Brave | Opera | Chromium | Chrome



```
xavi@Xavion:~/Desktop/COMP4537A$ ./server 10.0.0.210 8080
Server listening on 10.0.0.210:8080
New connection from 10.0.0.210:54744
Message from client 0: GET / HTTP/1.1
Host: 10.0.0.210:8080
Connection: keep-alive
DNT: 1
Upgrade-Insecure-Requests: 1
User-Agent: Mozilla/5.0 (X11; Linux x86_64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/121.0.0.0 Safari/537.36
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/webp,image/apng,*/*;q=0.8,application/signed-exchange;v=b3;q=0.7
Accept-Encoding: gzip, deflate
Accept-Language: en-CA,en-US;q=0.9,en-GB;q=0.8,en;q=0.7

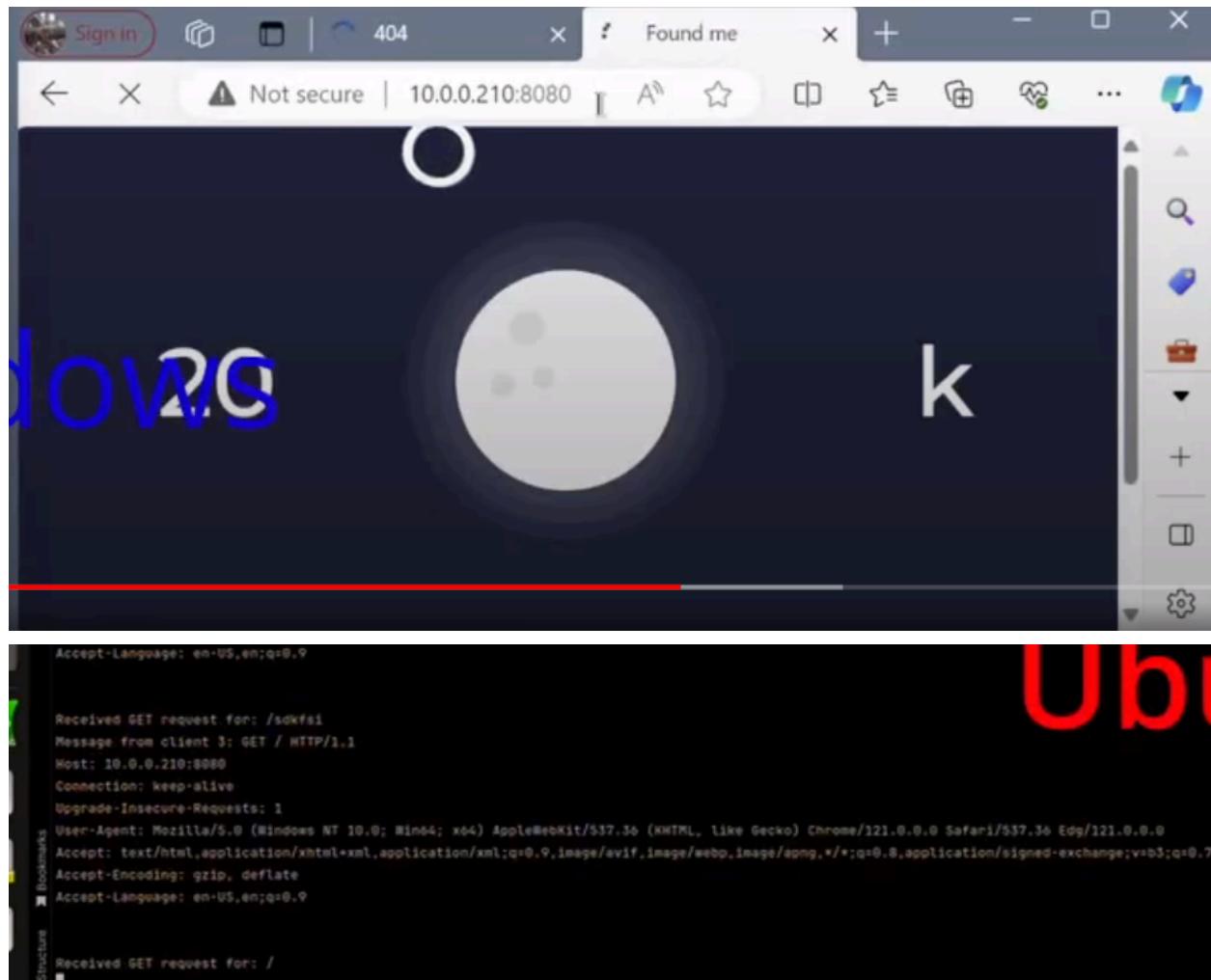
Received GET request for: /
New connection from 10.0.0.210:54772
New connection from 10.0.0.210:43988
Message from client 3: GET / HTTP/1.1
Host: 10.0.0.210:8080
Connection: keep-alive
Upgrade-Insecure-Requests: 1
User-Agent: Mozilla/5.0 (X11; Linux x86_64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/120.0.0.0 Safari/537.36 OPR/106.0.0.0
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/webp,image/apng,*/*;q=0.8,application/signed-exchange;v=b3;q=0.7
Accept-Encoding: gzip, deflate
Accept-Language: en-US,en;q=0.9

Received GET request for: /
New connection from 10.0.0.210:44000
New connection from 10.0.0.210:44008
Message from client 5: GET / HTTP/1.1
Host: 10.0.0.210:8080
Connection: keep-alive
Cache-Control: max-age=0
Upgrade-Insecure-Requests: 1
User-Agent: Mozilla/5.0 (X11; Linux x86_64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/121.0.0.0 Safari/537.36
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/webp,image/apng,*/*;q=0.8
Sec-GPC: 1
Accept-Language: en-US,en
Accept-Encoding: gzip, deflate

Received GET request for: /
```

## Browser Compatibility Test Part 2:

Edge



## Multi-Client disconnect

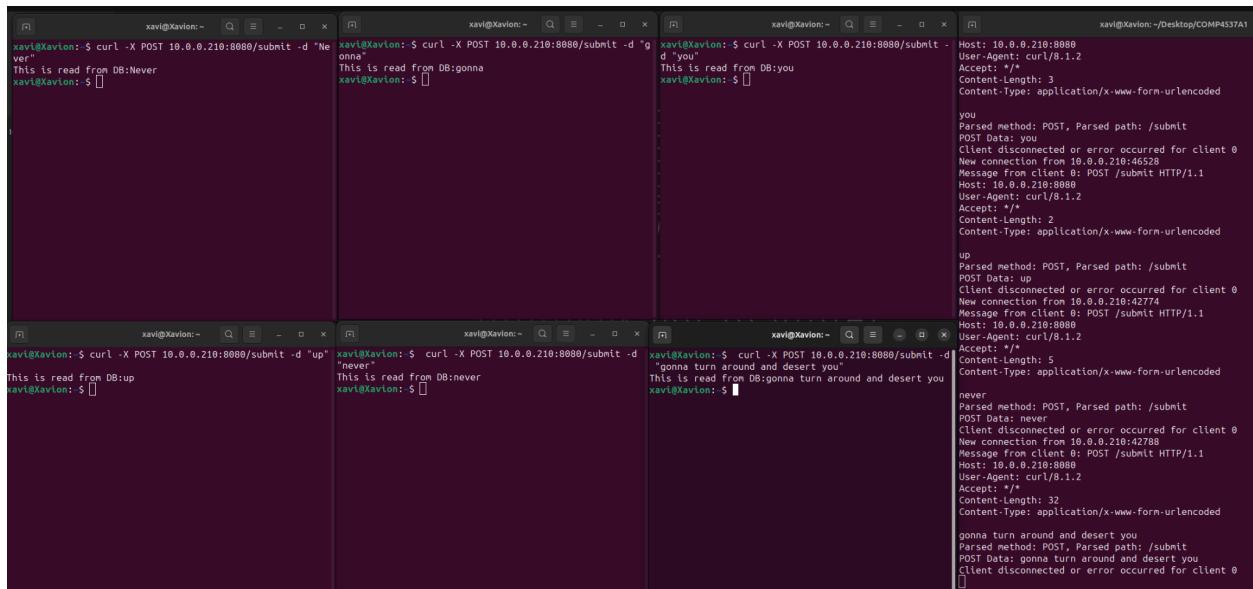
```
Connection: keep-alive
Upgrade-Insecure-Requests: 1
User-Agent: Mozilla/5.0 (X11; Linux x86_64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/121.0.0.0 Safari/537.36
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/webp,image/apng,*/*;q=0.8,application/signed-exchange;v=b3;q=0.7
Accept-Encoding: gzip, deflate
Accept-Language: en-US,en;q=0.9

Received GET request for: /
New connection from 10.0.0.210:54772
New connection from 10.0.0.210:43988
Message from client 3: GET / HTTP/1.1
Host: 10.0.0.210:8080
Connection: keep-alive
Upgrade-Insecure-Requests: 1
User-Agent: Mozilla/5.0 (X11; Linux x86_64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/120.0.0.0 Safari/537.36 OPR/106.0.0.0
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/webp,image/apng,*/*;q=0.8,application/signed-exchange;v=b3;q=0.7
Accept-Encoding: gzip, deflate
Accept-Language: en-US,en;q=0.9

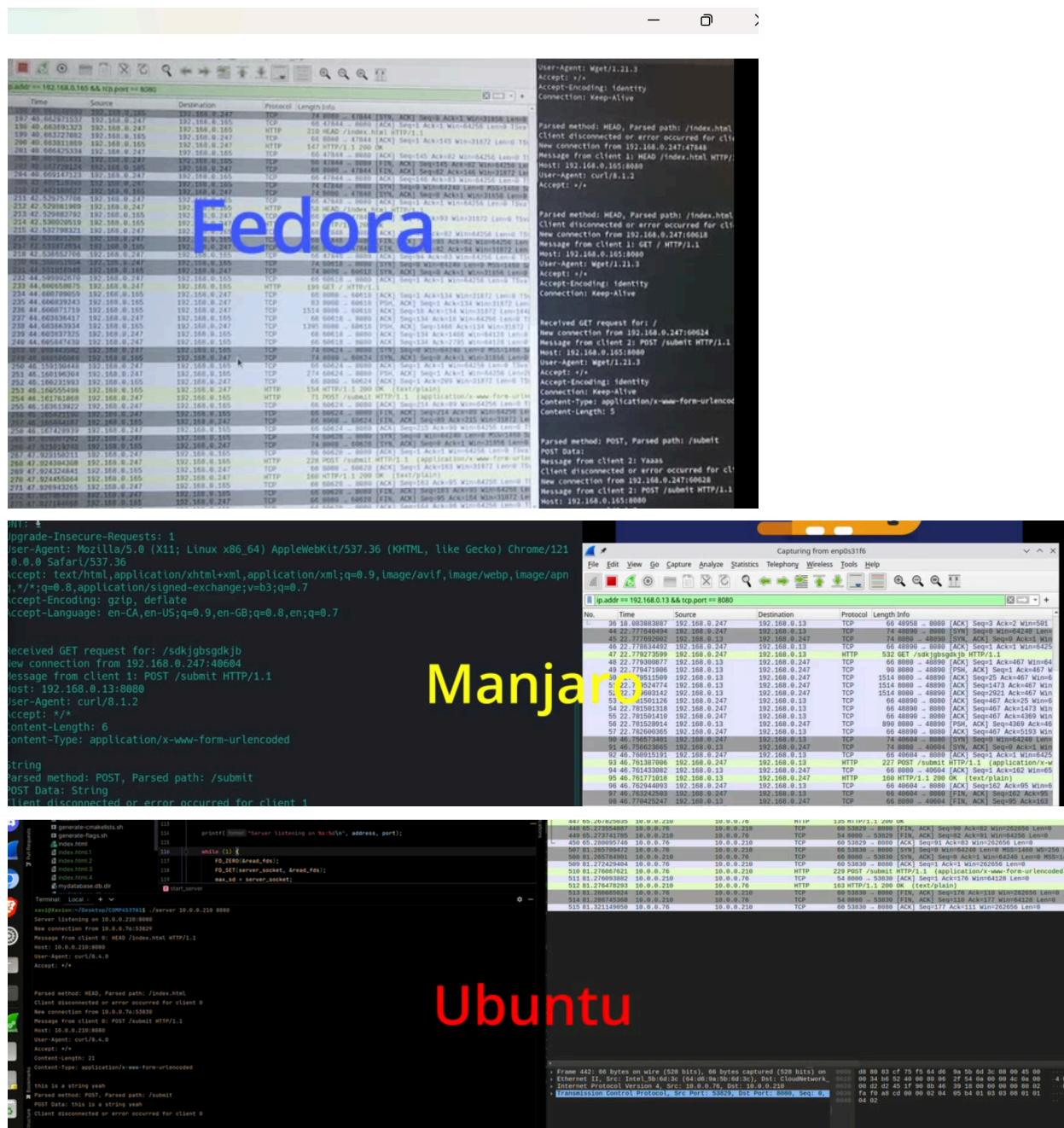
Received GET request for: /
New connection from 10.0.0.210:44000
New connection from 10.0.0.210:44008
Message from client 5: GET / HTTP/1.1
Host: 10.0.0.210:8080
Connection: keep-alive
Cache-Control: max-age=0
Upgrade-Insecure-Requests: 1
User-Agent: Mozilla/5.0 (X11; Linux x86_64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/121.0.0.0 Safari/537.36
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/webp,image/apng,*/*;q=0.8
Sec-GPC: 1
Accept-Language: en-US,en
Accept-Encoding: gzip, deflate

Received GET request for: /
Client disconnected or error occurred for client 5
Client disconnected or error occurred for client 1
Client disconnected or error occurred for client 2
Client disconnected or error occurred for client 3
Client disconnected or error occurred for client 0
Client disconnected or error occurred for client 4
```

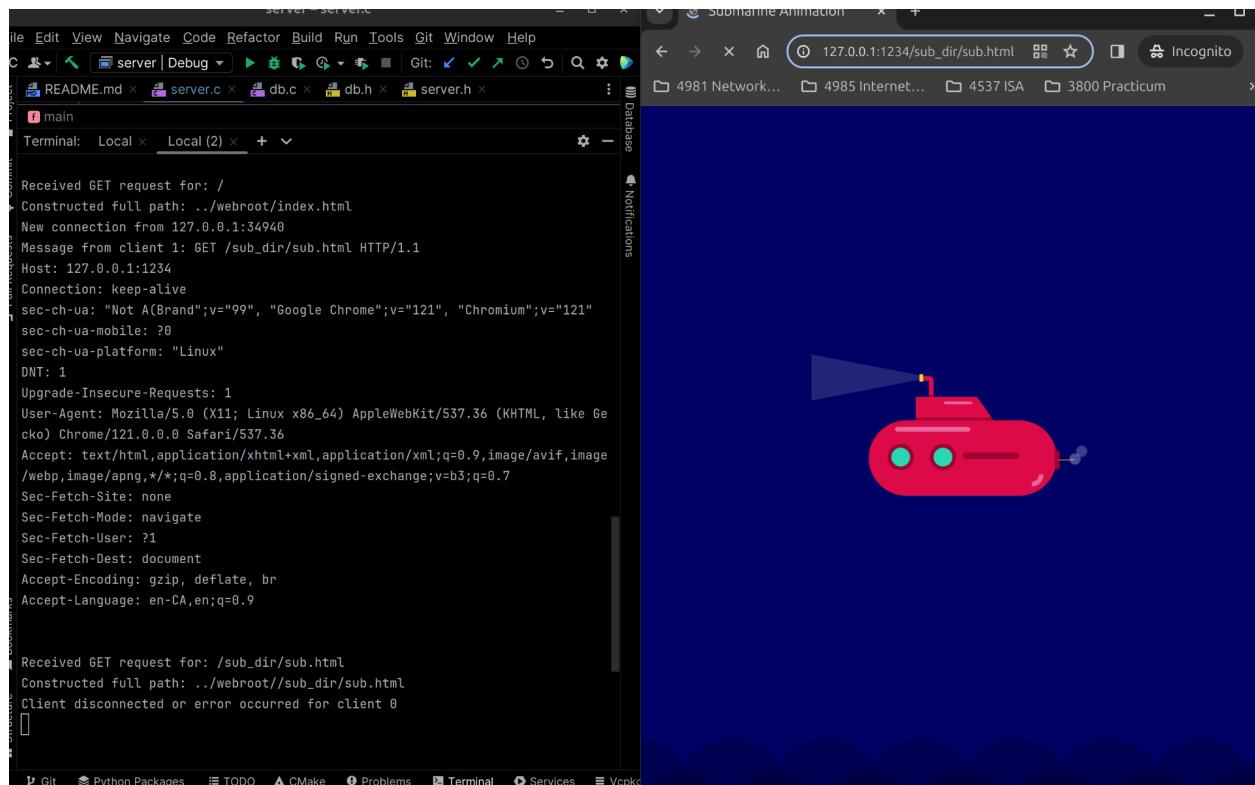
## Multi Post connected



## Multi OS

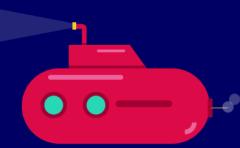


## Subdirectory access

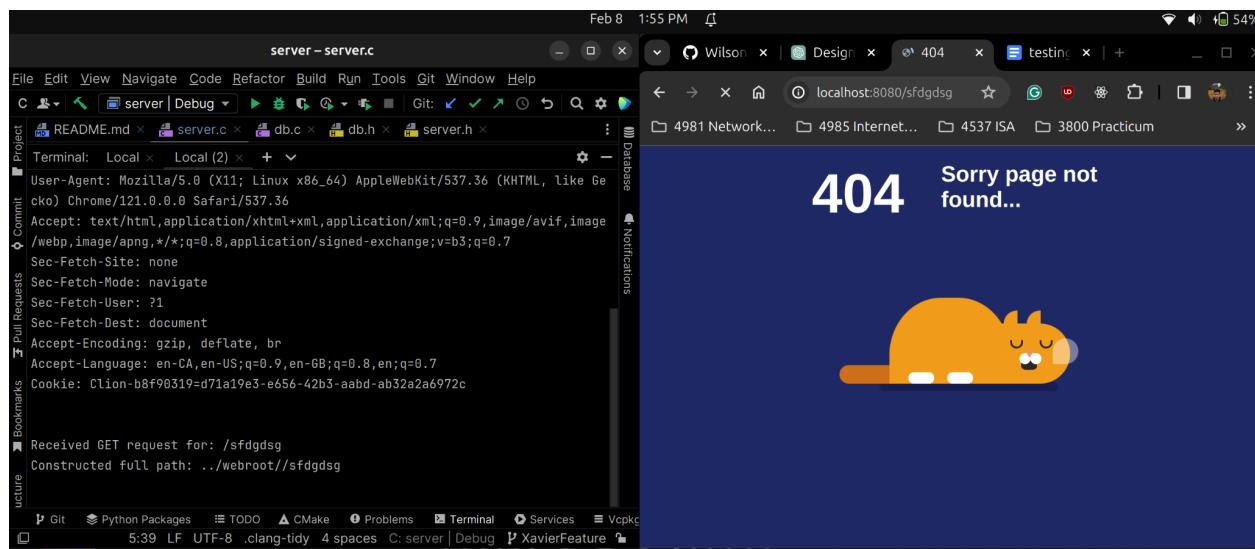


```
Received GET request for: /
Constructed full path: ../webroot/index.html
New connection from 127.0.0.1:34940
Message from client 1: GET /sub_dir/sub.html HTTP/1.1
Host: 127.0.0.1:1234
Connection: keep-alive
sec-ch-ua: "Not A(Brand";v="99", "Google Chrome";v="121", "Chromium";v="121"
sec-ch-ua-mobile: ?0
sec-ch-ua-platform: "Linux"
DNT: 1
Upgrade-Insecure-Requests: 1
User-Agent: Mozilla/5.0 (X11; Linux x86_64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/121.0.0.0 Safari/537.36
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/webp,image/apng,*/*;q=0.8,application/signed-exchange;v=b3;q=0.7
Sec-Fetch-Site: none
Sec-Fetch-Mode: navigate
Sec-Fetch-User: ?1
Sec-Fetch-Dest: document
Accept-Encoding: gzip, deflate, br
Accept-Language: en-CA,en;q=0.9

Received GET request for: /sub_dir/sub.html
Constructed full path: ../webroot//sub_dir/sub.html
Client disconnected or error occurred for client 0
```



## 404 File not found test



```
Received GET request for: /sfdgdsg
Constructed full path: ../webroot//sfdgdsg
```

