

Project: Building a Multi-Threaded Web Server

Part A: Building the connection request to Web Server

In this part of code, we are implementing multi-threaded web server, which means the server is capable of processing the individual request execution in separate thread simultaneously with multiple threads running. This allows server to accept multiple requests in parallel and perform the operations at a time. The browser is given by "localhost:5500/" which initiates the connection with the server. The code accepts 5500 port number to request the web server from the browser used. Followed by this, a socket is opened and waits for TCP connection request. Once the connection is established, the HttpRequest message is accepted to open the requested file in any format.

```
Connected to Client
Connected to Client

GET /index.html HTTP/1.1
Host: 127.0.0.1:5500
Connection: keep-alive
sec-ch-ua: "Chromium";v="106", "Avast Secure Browser";v="106", "Not;A=Brand";v="99"
sec-ch-ua-mobile: ?0
sec-ch-ua-platform: "Windows"
DNT: 1
Upgrade-Insecure-Requests: 1
User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/106.0.5249.119 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=0.9
Sec-Fetch-Site: none
Sec-Fetch-Mode: navigate
Sec-Fetch-User: ?1
Sec-Fetch-Dest: document
Accept-Encoding: gzip, deflate, br
Accept-Language: en-US,en;q=0.9
If-None-Match: W/"18a-184105411e5"
If-Modified-Since: Tue, 25 Oct 2022 18:07:35 GMT
```

Figure 1: Connected to Client message

The above screenshot displays the message of establishing the connection by "connected to client" message. This makes sure that the connection is established.

Part B: Processing the request and producing the desired output.

Once the connection is established, the browser is passed with "localhost:5500/(filename.fileformat)", which throws the file to the browser indicating that it fetched the file from the path given and displayed the page format.

Here, we are checking for 4 cases which includes as following:

Case 1:

Passing "localhost: 5500/index.html" file onto browser, this establishes connection and displays the html file as shown below in the screenshot.



The screenshot shows a web browser window with the address bar displaying "127.0.0.1:5501/index.html". The page content includes a form titled "CN Form" with two input fields: "First name:" containing the text "John" and "Last name:" containing the text "Doe". Below these fields is a "Submit" button.

Figure: Index.html fetched Screenshot

Case 2:

Passing “localhost: 5500/doggy.jpeg” file onto browser, this establishes connection and displays the html file as shown below in the screenshot.

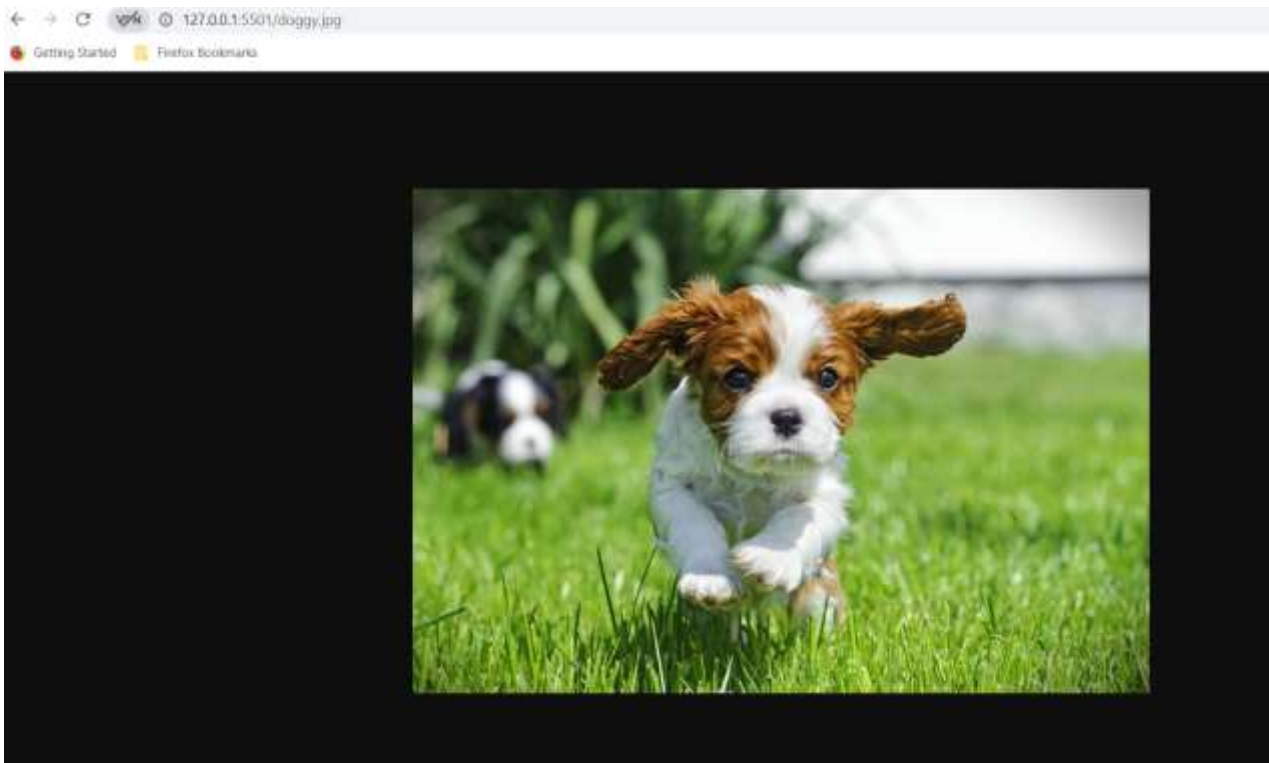


Figure: doggy.jpg fetched Screenshot

Case 3:

Passing “localhost: 5500/globe.gif” file onto browser, this establishes connection and displays the html file as shown below in the screenshot.



Figure: globe.gif fetched screenshot

Case 4:

The below screenshot displays the error found if the browser is given with the file name that does not exist.

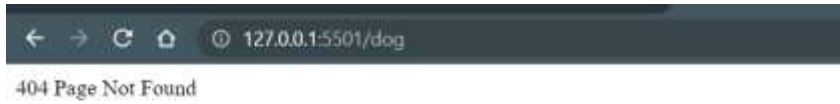


Figure: Error when fetched non-existing file