

**Name:** Xiongsheng(Ethan) Yi

**Assignment Name:** COEN317 Programming Assignment 1

### **High-level description of the project and what it does:**

- This project implemented a Java web server which supported HTTP 1.0 & 1.1. When multiple simultaneous TCP connections were requested by clients, the server could handle all the incoming requests, then retrieve the requested file or provide error info to the clients by multi-threaded approach. Once a connection is idle for a pre-set timeout period, the connection would be terminated by the server automatically.
- Status codes 200, 400, 403, 404 are supported. Content type, content length and date info are also included in the response header. Supported file types are .html, .txt, .jpg and .gif. "GET" method is the only method supported by the server.
- A simple heuristic dynamic socket timeout mechanism was implemented in the server as well, which controlled the idle connection time based on the number of existing active connection threads.

# of existing threads < 10:	socket timeout in 60s
10 <= # of existing thread < 20:	socket timeout in 30s
# of existing threads >= 20:	socket timeout in 5s

### **A list of submitted files:**

> MyPA1Server1

- MyServer1.java
- MySocketHandler.java
- ReadMe.pdf

> files:

- index.html
- puppy.gif
- scu.jpg
- texttest.txt

### **Instructions for running your program**

- Make sure Java is installed in your computer.
- Open a terminal and go to the project "MyPA1Server1" directory.
- Compile the java server.  
    \$ javac MyServer1.java
- Run the java server.

```
$ java MyServer1 -document_root "<your directory>/MyPA1Server1" -port 8888
```

- Input the URL address "localhost:8888" in browser

## Demonstration of screenshots:

URL: localhost:8888

localhost:8888/

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Network tab details:

- Name: index.html
- Request URL: http://localhost:8888/index.html
- Request Method: GET
- Status Code: 200 OK
- Remote Address: [::1]:8888
- Referrer Policy: strict-origin-when-cross-origin
- Content-length: 37455
- Content-type: text/html
- Date: Sat Feb 04 23:56:24 PST 2023

URL: localhost:8888/index.html

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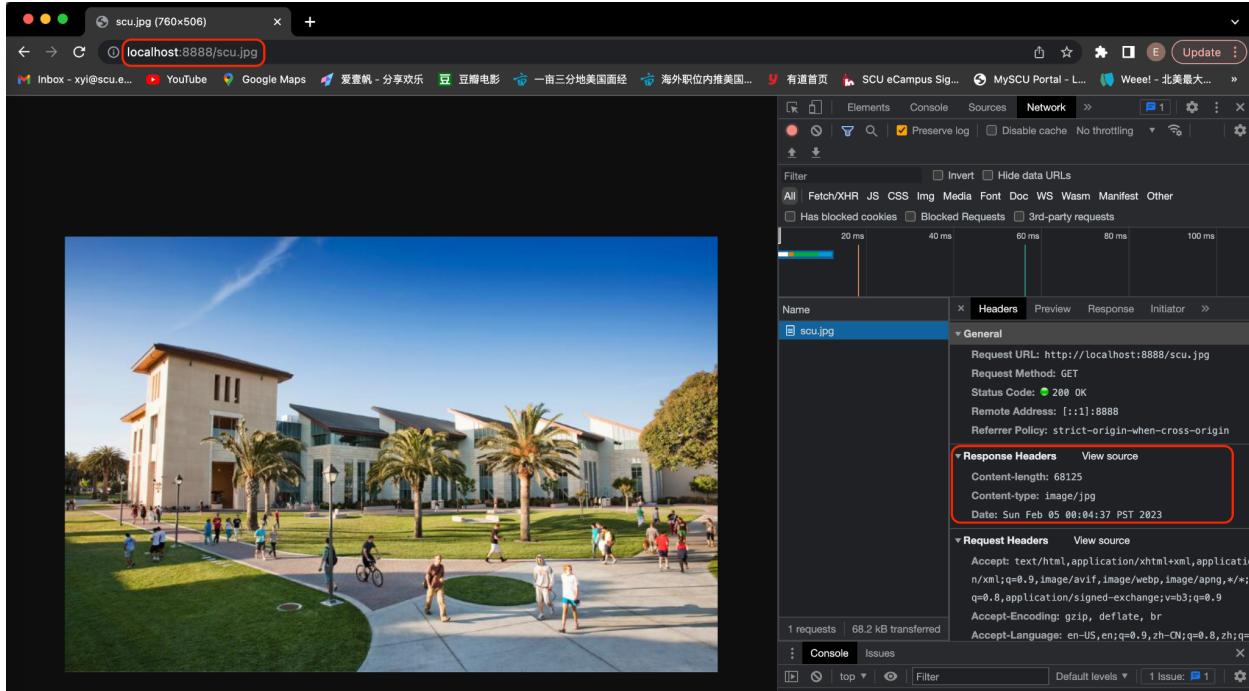
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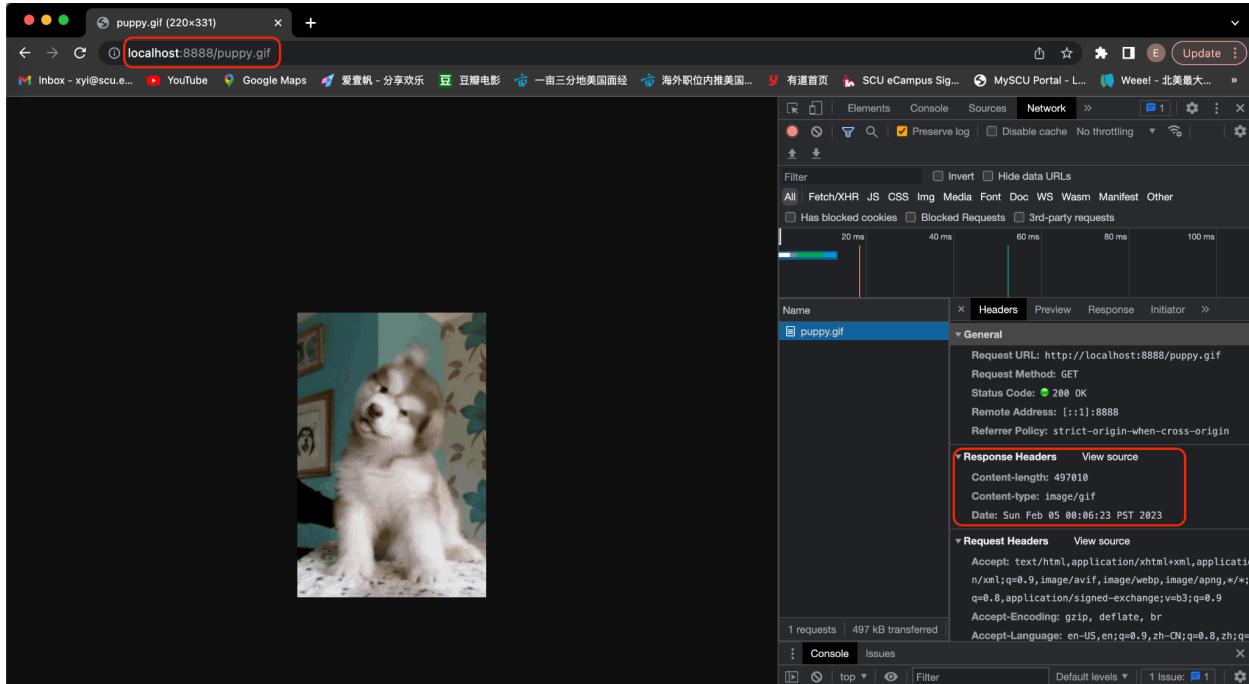
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- Referrer Policy: strict-origin-when-cross-origin
- Content-length: 37455
- Content-type: text/html
- Date: Sun Feb 05 00:02:07 PST 2023

URL: localhost:8888/scu.jpg



URL: localhost:8888/puppy.gif



URL: localhost:8888/texttest.txt

A screenshot of a Mac OS X desktop showing a browser window and a Network tab in the developer tools. The browser URL is 'localhost:8888/texttest.txt'. The page content is 'Welcome to COEN317 programming assignment 1.'. The Network tab shows a single request for 'texttest.txt' with a status of '200 OK'. The Response Headers section is highlighted with a red box, showing:

- Request URL: http://localhost:8888/texttest.txt
- Status Code: 200 OK
- Content-length: 45
- Content-type: text/plain
- Date: Sun Feb 05 00:13:23 PST 2023

Test for Bad Request (invalid file type): should be .gif but .gi

Status code: 400 Bad Request

Other files without proper file type suffix also apply.

A screenshot of a Mac OS X desktop showing a browser window and a Network tab in the developer tools. The browser URL is 'localhost:8888/puppy.gif'. The page content shows a broken image icon and the text 'This page isn't working'. The Network tab shows a request for 'puppy.gif' with a status of '400 Bad Request'. The Response Headers section is highlighted with a red box, showing:

- Request URL: http://localhost:8888/puppy.gif
- Status Code: 400 Bad Request
- Content-length: 0
- Content-type: null
- Date: Sun Feb 05 00:15:17 PST 2023

Test for file not found (invalid file name): should be scu.jpg but su.jpg

Status code: 404 Not Found

Other files without proper file names also apply.

This localhost page can't be found

No webpage was found for the web address: <http://localhost:8888/su.jpg>

HTTP ERROR 404

Reload

Request URL: http://localhost:8888/su.jpg  
Request Method: GET  
Status Code: 404 Not Found  
Remote Address: [::1]:8888  
Referrer Policy: strict-origin-when-cross-origin

Response Headers

Content-length: 0
Content-type: image/jpg
Date: Sun Feb 05 00:17:21 PST 2023

Request Headers

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
Accept-Encoding: gzip, deflate, br
Accept-Language: en-US,en;q=0.9,zh-CN;q=0.8,zh;q=0.7

Test for file access denied: (set file not readable by \$ chmod a-r <file name>)

Status code: 403 Forbidden

Other files without proper permission also apply.

Access to localhost was denied

You don't have authorization to view this page.

HTTP ERROR 403

Reload

Request URL: http://localhost:8888/permission.txt  
Request Method: GET  
Status Code: 403 Forbidden  
Remote Address: [::1]:8888  
Referrer Policy: strict-origin-when-cross-origin

Response Headers

Content-length: 0
Content-type: text/plain
Date: Sun Feb 05 00:57:56 PST 2023

Request Headers

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
Accept-Encoding: gzip, deflate, br
Accept-Language: en-US,en;q=0.9,zh-CN;q=0.8,zh;q=0.7

## Some terminal logs demo:

```
● xsyi@Xiongshengs-MacBook-Pro MyPA1Server1 % javac MyServer1.java
○ xsyi@Xiongshengs-MacBook-Pro MyPA1Server1 % java MyServer1 -document_root "/Users/xsyi/MyJavaProjects/COEN317/MyPA1Server1" -port 8888
MyServer1 started, listening for incoming requests...
The Http Request is: GET /puppy.gif HTTP/1.1
Status code: 200 success!
Socket closed.

The Http Request is: GET /texttest.txt HTTP/1.1
Status code: 200 success!
Socket closed.

The Http Request is: GET /scu.jpg HTTP/1.1
Status code: 200 success!
Socket closed.

The Http Request is: GET /scuuuu.jpg HTTP/1.1
Status code: 404 not found
Socket closed.

The Http Request is: GET /index.html HTTP/1.1
Status code: 200 success!
Socket closed.
```