Lab 1 :

I have a server.py implemented from the given skeleton code. I also have a HelloWorld.html containing the text *'Hello World'*.

>server.py

```
#import socket module
from socket import *
import sys # In order to terminate the program

#Prepare a sever socket
serverSocket = socket(AF_INET, SOCK_STREAM)
serverPort = 6789
serverSocket.bind(('', serverPort))
serverSocket.listen(1)

while True:
    print('Ready to serve...')
    connectionSocket, addr = serverSocket.accept()   #Establish the connection
    try:
        message = connectionSocket.recv(1024)
        filename = message.split()[1]
        f = open(filename[1:], "rb")
        outputdata = f.read()
        #Send one HTTP header line into socket
        header = '\nHTTP/1.1 200 OK\n\n'
        connectionSocket.send(header.encode())

        for i in range(2, len(outputdata)):
            connectionSocket.send(outputdata[i:i+1])
        connectionSocket.send("\r\n".encode())

        connectionSocket.close()

    except IOError:
        connectionSocket.send('HTTP/1.1 404 Not Found\r\n\r\n'.encode())
        errorMessage = '<html><head></head><body><h1>404 Not Found</h1></body></html>\r\n'
        connectionSocket.send(errorMessage.encode())
        connectionSocket.send(b'\r\n')

        connectionSocket.close()

    serverSocket.close()
    sys.exit()#Terminate the program after sending the corresponding data
```

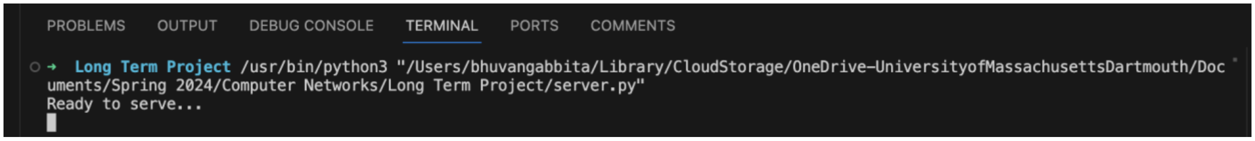
>HelloWorld.html

```
<html>
<head>
    <title>Hello World</title>
</head>

<body >
Hello World
<iframe name="hiddenIFrame" style="display:none;"></iframe>
</body>
</html>
```

(Ignore the iframe)

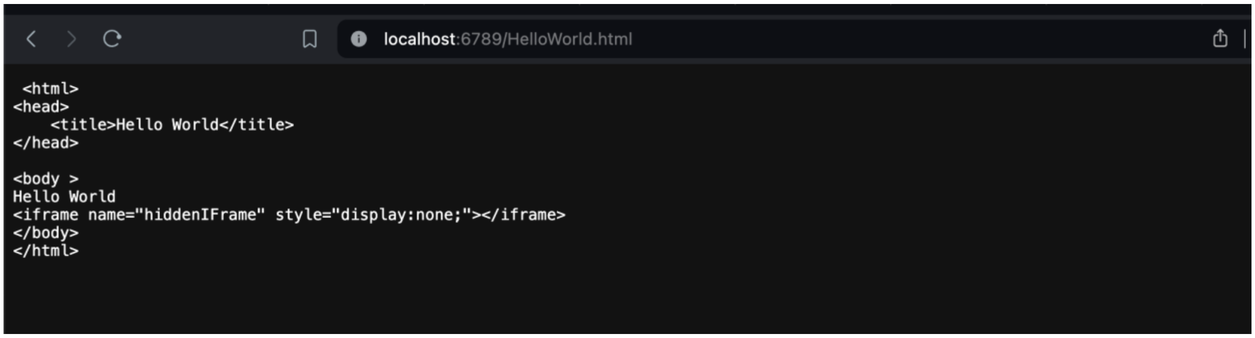
Scenario 1:
Requesting HelloWorld.html.

- ➢ Run server.py



```
○ → Long Term Project /usr/bin/python3 "/Users/bhuvangabbita/Library/CloudStorage/OneDrive-UniversityofMassachusettsDartmouth/Doc
uments/Spring 2024/Computer Networks/Long Term Project/server.py"
Ready to serve...
▮
```

- ➢ Request for HelloWorld.html in the URL bar.

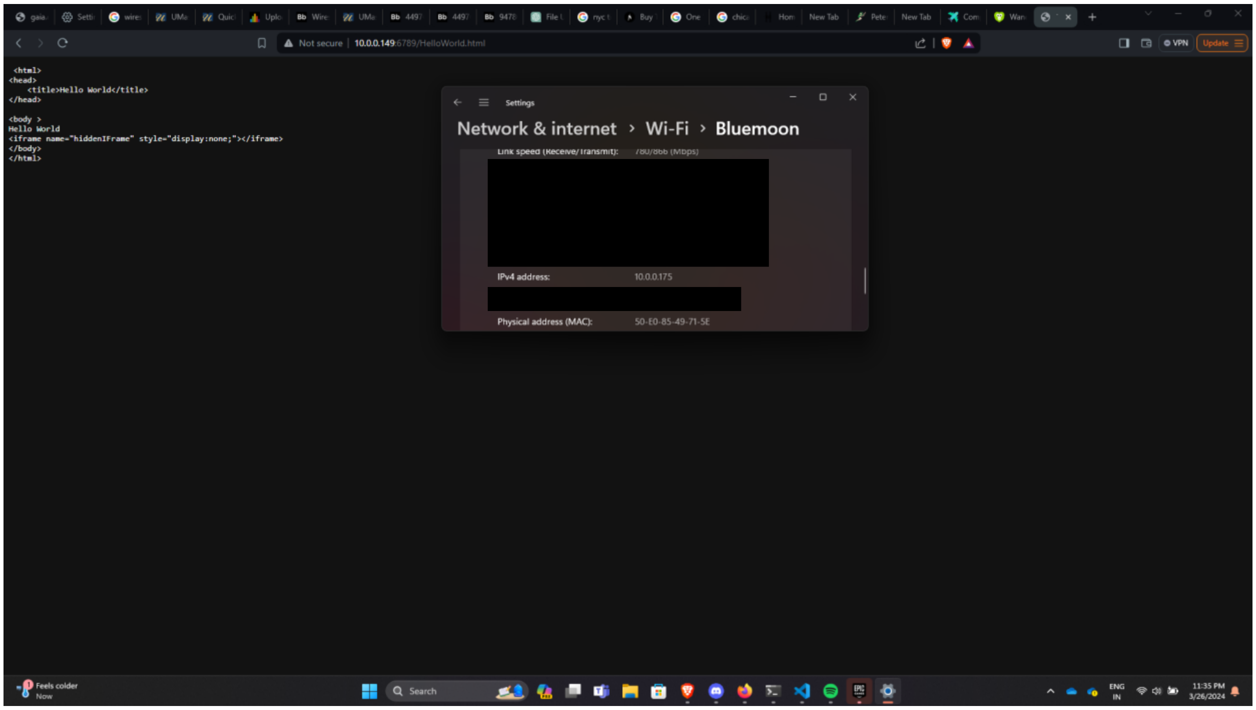
- 

localhost:6789/HelloWorld.html

```
 <html>
<head>
    <title>Hello World</title>
</head>

<body >
Hello World
<iframe name="hiddenIFrame" style="display:none;"></iframe>
</body>
</html>
```

- Since we are running the server on our system(Mac), we request using localhost from client browser.

- Now I tried requesting from a Windows laptop which has a completely different IP address and was able to access the file contents.



Not secure | 10.0.0.149:6789/HelloWorld.html

```
<html>
<head>
    <title>Hello World</title>
</head>

<body >
Hello World
<iframe name="hiddenIFrame" style="display:none;"></iframe>
</body>
</html>
```

Settings

Network & internet › Wi-Fi › Bluemoon

Link speed (Receive/Transmit): 780/866 (Mbps)

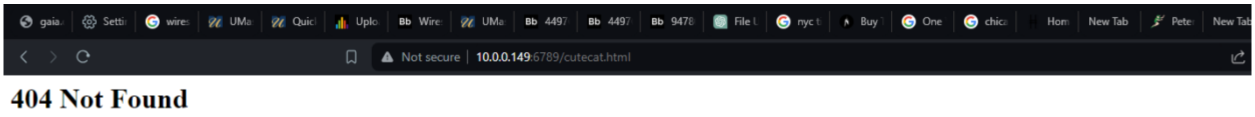
[redacted]

IPv4 address: 10.0.0.175

[redacted]

Physical address (MAC): 50-E0-85-49-71-5E

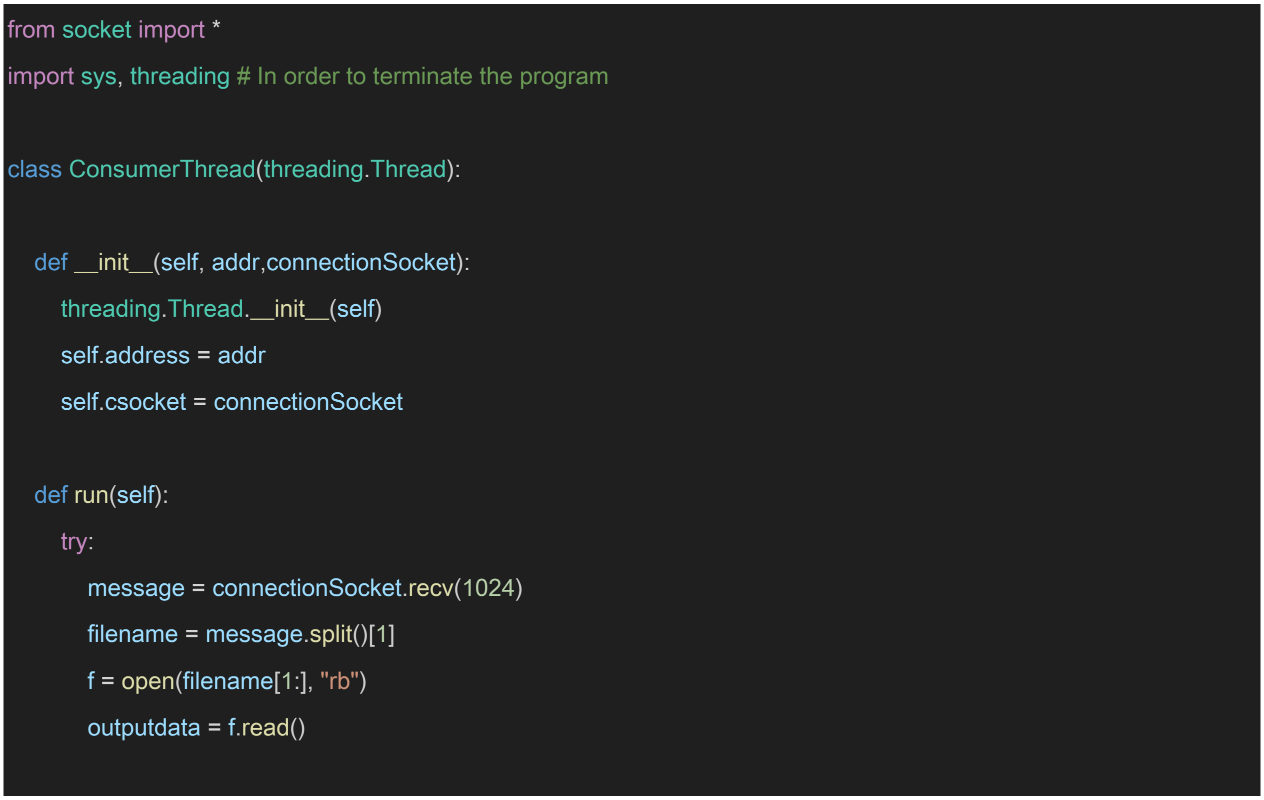
Scenario 2:
Requesting cutecat.html (File doesn’t exist at the server side)



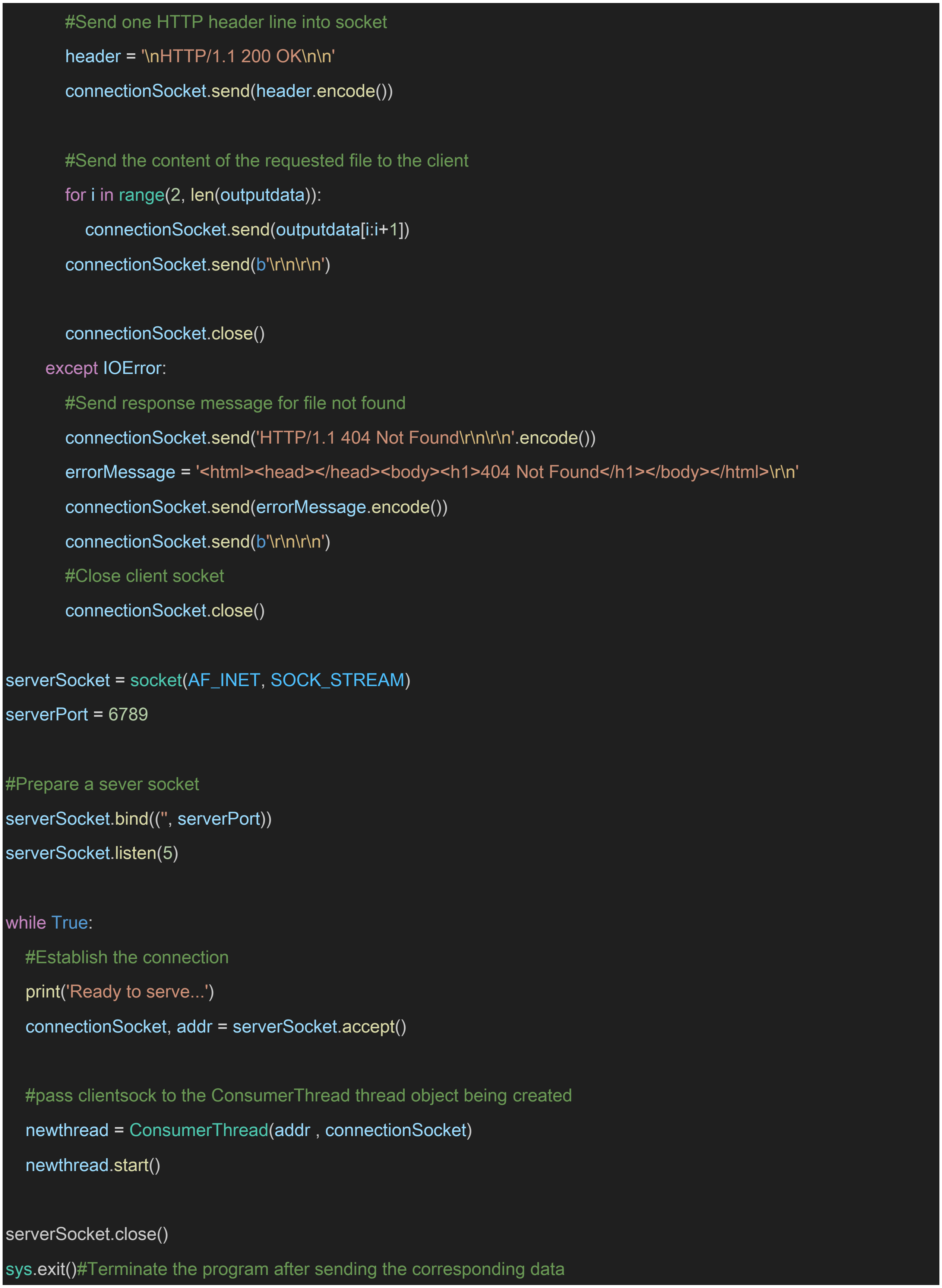
404 Not Found

Optional Exercise:

1. I have written a server script that runs and creates a thread for every client connection .
   >multiserverthread.py

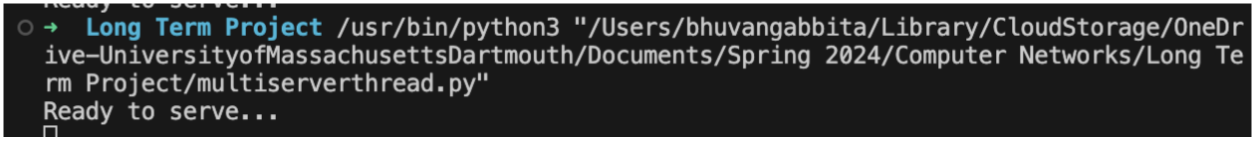


```
from socket import *
import sys, threading # In order to terminate the program

class ConsumerThread(threading.Thread):

    def __init__(self, addr,connectionSocket):
        threading.Thread.__init__(self)
        self.address = addr
        self.csocket = connectionSocket

    def run(self):
        try:
            message = connectionSocket.recv(1024)
            filename = message.split()[1]
            f = open(filename[1:], "rb")
            outputdata = f.read()
```



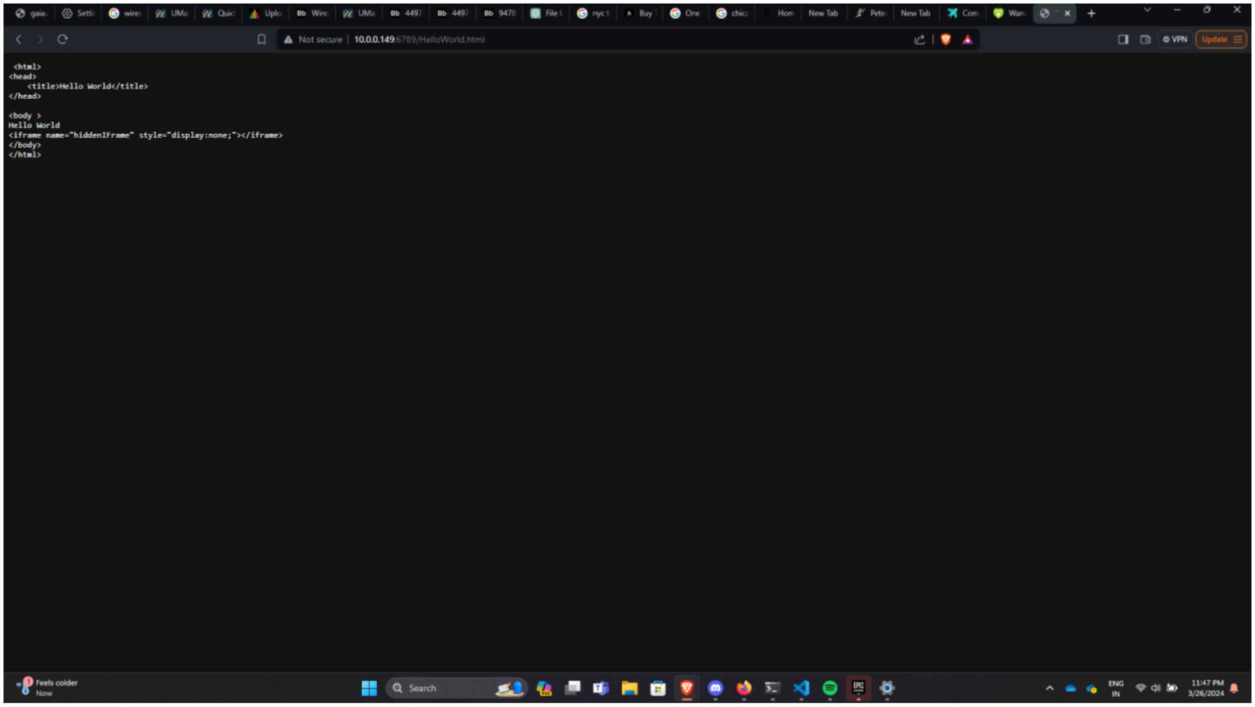
```
            #Send one HTTP header line into socket
            header = '\nHTTP/1.1 200 OK\n\n'
            connectionSocket.send(header.encode())

            #Send the content of the requested file to the client
            for i in range(2, len(outputdata)):
                connectionSocket.send(outputdata[i:i+1])
            connectionSocket.send(b'\r\n\r\n')

            connectionSocket.close()
        except IOError:
            #Send response message for file not found
            connectionSocket.send('HTTP/1.1 404 Not Found\r\n\r\n'.encode())
            errorMessage = '<html><head></head><body><h1>404 Not Found</h1></body></html>\r\n'
            connectionSocket.send(errorMessage.encode())
            connectionSocket.send(b'\r\n\r\n')
            #Close client socket
            connectionSocket.close()

serverSocket = socket(AF_INET, SOCK_STREAM)
serverPort = 6789

#Prepare a sever socket
serverSocket.bind(('', serverPort))
serverSocket.listen(5)

while True:
    #Establish the connection
    print('Ready to serve...')
    connectionSocket, addr = serverSocket.accept()

    #pass clientsock to the ConsumerThread thread object being created
    newthread = ConsumerThread(addr , connectionSocket)
    newthread.start()

serverSocket.close()
sys.exit()#Terminate the program after sending the corresponding data
```

Opening multiple clients for the same server.



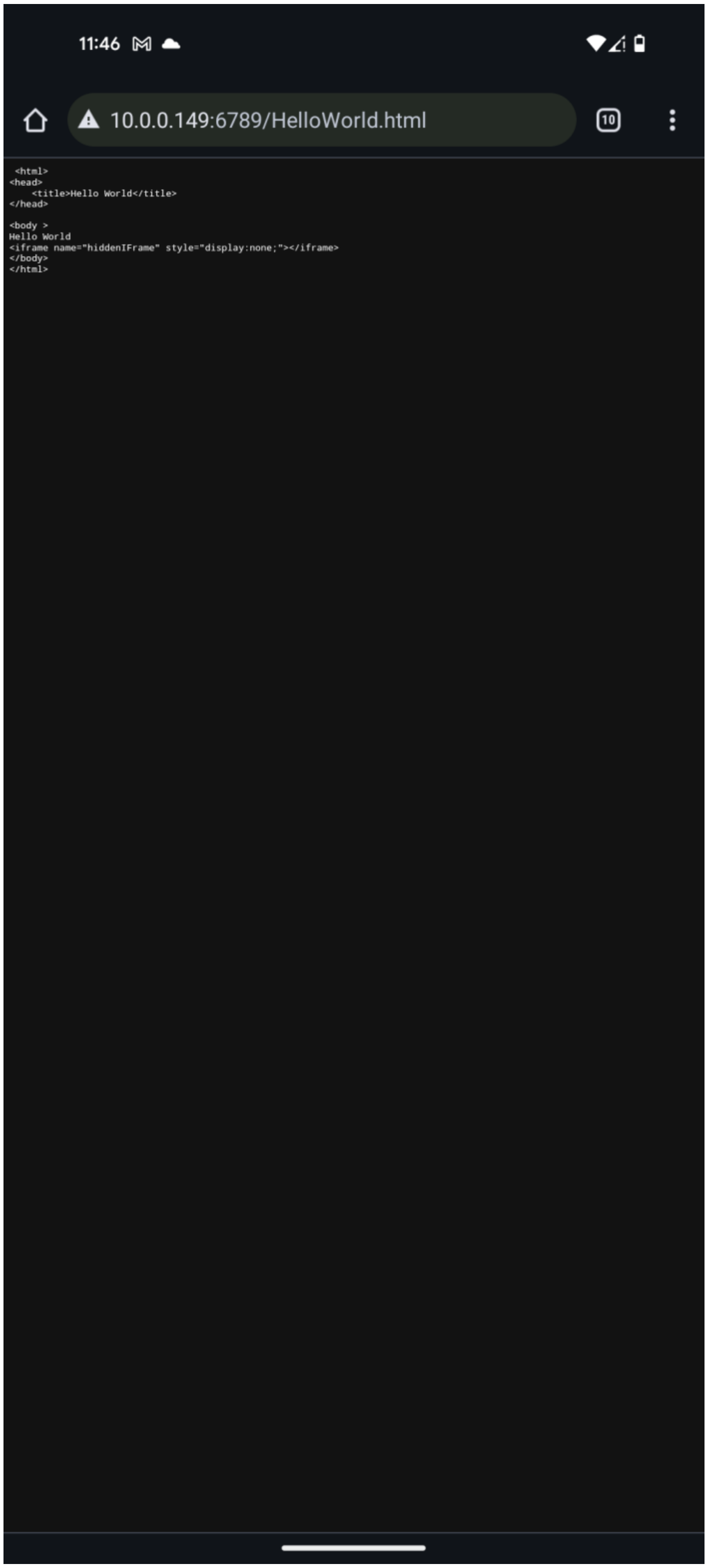
```
Ready to serve...
○ → Long Term Project /usr/bin/python3 "/Users/bhuvangabbita/Library/CloudStorage/OneDr
  ive-UniversityofMassachusettsDartmouth/Documents/Spring 2024/Computer Networks/Long Te
  rm Project/multiserverthread.py"
  Ready to serve...
  □
```

On windows laptop:



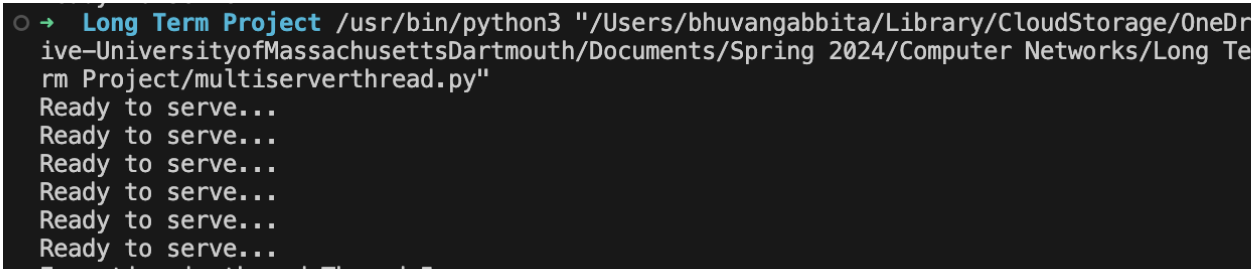
```
 <html>
<head>
    <title>Hello World</title>
</head>

<body >
Hello World
<iframe name="hiddenIframe" style="display:none;"></iframe>
</body>
</html>
```

On Phone:



```
 <html>
<head>
    <title>Hello World</title>
</head>

<body >
Hello World
<iframe name="hiddenIFrame" style="display:none;"></iframe>
</body>
</html>
```

Server after multiple client requests.



```
○ → Long Term Project /usr/bin/python3 "/Users/bhuvangabbita/Library/CloudStorage/OneDr
ive-UniversityofMassachusettsDartmouth/Documents/Spring 2024/Computer Networks/Long Te
rm Project/multiserverthread.py"
Ready to serve...
Ready to serve...
Ready to serve...
Ready to serve...
Ready to serve...
Ready to serve...
```

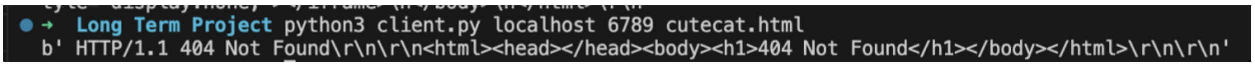
2. Wrote a client.py script that performs a GET request for the file and retrieves the contents.

>client.py

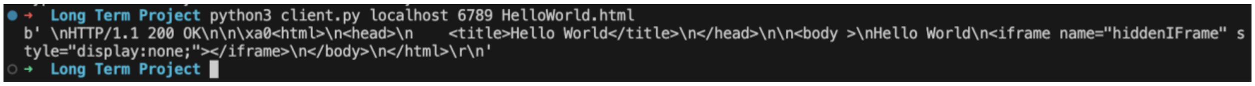
```
from socket import *
import sys

serverName = sys.argv[1]
serverPort = int(sys.argv[2])
file_name = sys.argv[3]

clientSocket = socket(AF_INET, SOCK_STREAM)
clientSocket.connect((serverName, serverPort))

message = 'GET /' + file_name
clientSocket.send(message.encode())
# header = repr(clientSocket.recv(1024))#.decode('utf-8')
# messageReceived = repr(clientSocket.recv(1024))#.decode('utf-8')
# finalMessage = ''
# while messageReceived:
#     finalMessage += messageReceived
#     messageReceived = repr(clientSocket.recv(1024)) #.decode('utf-8')

response = b""
while True:
    part = clientSocket.recv(1024)
    if not part:
        break
    response += part
```

```
print(response)

clientSocket.close()
```

Upon running the client.py with server, port and filename as commandline arguments.



```
tyle="display:none;"></iframe>\n</body>\n</html>\r\n
● → Long Term Project python3 client.py localhost 6789 cutecat.html
  b' HTTP/1.1 404 Not Found\r\n\r\n<html><head></head><body><h1>404 Not Found</h1></body></html>\r\n\r\n'
```



```
● → Long Term Project python3 client.py localhost 6789 HelloWorld.html
  b' \nHTTP/1.1 200 OK\n\n\xa0<html>\n<head>\n    <title>Hello World</title>\n</head>\n\n<body >\nHello World\n<iframe name="hiddenIFrame" s
  tyle="display:none;"></iframe>\n</body>\n</html>\r\n'
○ → Long Term Project 
```