Project - Sockets and HTTP
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- **Introduction and Questions:**

  This was my first-time writing python programs, so I made a lot of research and took a long time to finish this project. The three parts are written in three different python files: part1.py, part2.py, and part3.py.

- **Instructions for running my programs, which are all python3:**

  run part1.py: python3 part1.py
  run part2.py: python3 part2.py
  run part3.py: python3 part3.py

- **Screenshots of my running code:**

Part 1: Using a socket to GET a file (tested on flip1)

```
flip1 ~/CS372/project1 163% python3 part1.py
Request: GET /wireshark-labs/INTRO-wireshark-file1.html HTTP/1.1
Host:gaia.cs.umass.edu


[RECV] - length: 382
HTTP/1.1 200 OK
Date: Mon, 25 Jan 2021 11:07:36 GMT
Server: Apache/2.4.6 (CentOS) OpenSSL/1.0.2k-fips PHP/7.4.14 mod_perl/2.0.11 Perl/v5.16.3
Last-Modified: Mon, 25 Jan 2021 06:59:02 GMT
ETag: "51-5b9b412ad1b5a"
Accept-Ranges: bytes
Content-Length: 81
Content-Type: text/html; charset=UTF-8

<html>
Congratulations!  You've downloaded the first Wireshark lab file!
</html>

flip1 ~/CS372/project1 164%
```

Part 2: GET the data for a large file (tested on flip1)

```
flip1 ~/CS372/project1 164% python3 part2.py
Request: GET /wireshark-labs/HTTP-wireshark-file3.html HTTP/1.1
Host:gaia.cs.umass.edu


[RECV] - length: 4805
HTTP/1.1 200 OK
Date: Mon, 25 Jan 2021 11:09:46 GMT
Server: Apache/2.4.6 (CentOS) OpenSSL/1.0.2k-fips PHP/7.4.14 mod_perl/2.0.11 Perl/v5.16.3
Last-Modified: Mon, 25 Jan 2021 06:59:02 GMT
ETag: "1194-5b9b412acf449"
Accept-Ranges: bytes
Content-Length: 4500
Content-Type: text/html; charset=UTF-8

<html><head>
<title>Historical Documents:THE BILL OF RIGHTS</title></head>


<body bgcolor="#ffffff" link="#330000" vlink="#666633">
<p><br>
</p>
<p></p><center><b>THE BILL OF RIGHTS</b><br>
  <em>Amendments 1-10 of the Constitution</em>
</center>


<p>The Conventions of a number of the States having, at the time of adopting
the Constitution, expressed a desire, in order to prevent misconstruction
```

```
<p></p><p>Excessive bail shall not be required, nor excessive fines
imposed, nor cruel and unusual punishments inflicted.

</p><p><a name="9"><strong><h3>Amendment IX</h3></strong></a>

<p></p><p>The enumeration in the Constitution, of certain rights, shall
not be construed to deny or disparage others retained by the people.

</p><p><a name="10"><strong><h3>Amendment X</h3></strong></a>

<p></p>
<p>The powers not delegated to the United States by the Constitution, nor prohibited
  by it to the states, are reserved to the states respectively, or to the people.</p>
</body></html>
flip1 ~/CS372/project1 165% []
```

Part 3: The world's simplest HTTP server

NOTE: I tested this part in my own computer's PyCharm and received two GETS.


```
C:\Users\lixia\miniconda3\envs\sockets_http\python.exe "C:/Users/lixia/Desktop/CS 372/project1/sockets_http/part3.py"
Connected by ('127.0.0.1', 1234)
Received: GET / HTTP/1.1
Host: 127.0.0.1:1234
Connection: keep-alive
Cache-Control: max-age=0
sec-ch-ua: "Google Chrome";v="87", " Not;A Brand";v="99", "Chromium";v="87"
sec-ch-ua-mobile: ?0
Upgrade-Insecure-Requests: 1
User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/87.0.4280.141 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,zh-CN;q=0.8,zh;q=0.7


Sending>>>>>>>>>>
HTTP/1.1 200 OK
Content-Type: text/html; charset=UTF-8

<html>Congratulations! You've downloaded the first Wireshark lab file!</html>

<<<<<<<<<<<<<<<<
```

```
Received: GET /favicon.ico HTTP/1.1
Host: 127.0.0.1:1234
Connection: keep-alive
Pragma: no-cache
Cache-Control: no-cache
sec-ch-ua: "Google Chrome";v="87", " Not;A Brand";v="99", "Chromium";v="87"
sec-ch-ua-mobile: ?0
User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/87.0.4280.141 Safari/537.36
Accept: image/avif,image/webp,image/apng,image/*,*/*;q=0.8
Sec-Fetch-Site: same-origin
Sec-Fetch-Mode: no-cors
Sec-Fetch-Dest: image
Referer: http://127.0.0.1:1234/
Accept-Encoding: gzip, deflate, br
Accept-Language: en-US,en;q=0.9,zh-CN;q=0.8,zh;q=0.7


Sending>>>>>>>>>>
HTTP/1.1 200 OK
Content-Type: text/html; charset=UTF-8

<html>Congratulations! You've downloaded the first Wireshark lab file!</html>

<<<<<<<<<<<<<<<<

Process finished with exit code 0
```