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CS_372

01/19/26

Project 1 – Sockets and HTTP

This program was created by Adam Fitzpatrick, with the help of the CS 372 modules and referencing of the course book and the authors associated you tube videos.

- <https://www.youtube.com/@JimKurose>
- <https://canvas.oregonstate.edu/courses/2031497>
- Kurose and Ross, Computer Networking: A Top-Down Approach, 8th Edition, Pearson

All code was developed in the Pycharm IDE, python version 3.12.3. In order run each of these files, simply open them up in your IDE and start them. Another option would be to save the files locally and run them in the terminal, by navigating to that directory and using `python3 filename.py` for Linux or `python filename.py` in windows.

client.py:

A simple client socket, which creates a TCP socket and connects it `gaia.cs.umass.edu` using PORT 80. It then sends the sever a GET request and displays the response by reading and decoding up to 1024 bytes of data. This program also displays socket information such as the details of the sent request and the length of bytes received.

```

client.py

creates a simple client socket and retrieves data via a GET Request.

Code was generated by me with the help of the class module and
a class book "Networki

adam@Fitz-Cinnamon: ~/Documents/School/CS_372/Project1
adam@Fitz-Cinnamon:~$ cd ~/Documents
adam@Fitz-Cinnamon:~/Documents$ cd Sschool
bash: cd: Sschool: No such file or directory
adam@Fitz-Cinnamon:~/Documents$ cd School
adam@Fitz-Cinnamon:~/Documents/School$ cd CS_372
adam@Fitz-Cinnamon:~/Documents/School/CS_372$ cd Project1
adam@Fitz-Cinnamon:~/Documents/School/CS_372/Project1$ python3 client.py

Request: GET /wireshark-labs/INTRO-wireshark-file1.html HTTP/1.1
Host:gaia.cs.umass.edu

Length-Recieved: 385
HTTP/1.1 200 OK
Date: Mon, 19 Jan 2026 19:46:38 GMT
Server: Apache/2.4.62 (AlmaLinux) OpenSSL/3.5.1 mod_fcgid/2.3.9 mod_perl/2.0.12 Perl/v5.32.1
Last-Modified: Tue, 28 Oct 2025 05:59:01 GMT
ETag: "51-64231b6715777"
Accept-Ranges: bytes
Content-Length: 81
Content-Type: text/html; charset=UTF-8

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

adam@Fitz-Cinnamon:~/Documents/School/CS_372/Project1$

```

client_large.py:

This program/socket functions just like the simple client.py socket, with the exception being; after the GET request is sent the reading and printing of the response is inside of a while loop. This allows the socket to read (4096) bytes of data at a time, until the server closes the connection, in which bytes read will be equal to zero.

```

serverName = 'gaia.cs.umass.edu'
serverPort = 80

adam@Fitz-Cinnamon: ~/Documents/School/CS_372/Project1
clientSocket = <html>
Congratulations! You've downloaded the first Wireshark lab file!
clientSocket.close()</html>

request = "GET /adams@Fitz-Cinnamon:~/Documents/School/CS_372/Project1$ python3 client_large.py
Request: GET /wireshark-labs/HTTP-wireshark-file3.html HTTP/1.1
clientSocket.send(request)
Host:gaia.cs.umass.edu

print(f"\nRequest Length-Recieved: 4096
HTTP/1.1 200 OK
Date: Mon, 19 Jan 2026 19:53:50 GMT
Server: Apache/2.4.62 (AlmaLinux) OpenSSL/3.5.1 mod_fcgid/2.3.9 mod_perl/2.0.12 Perl/v5.32.1
Last-Modified: Tue, 28 Oct 2025 05:59:01 GMT
ETag: "1194-64231b6713c1f"
while True:
    contentReceived = clientSocket.recv(1024)
    contentLength = int(contentReceived.split('Content-Length:')[1].split()[0])
    if len(contentReceived) == contentLength:
        break
    contentReceived = clientSocket.recv(1024)
print(f"Length-Received: {contentLength}")
print(contentReceived)
clientSocket.close()
<html><head>
<title>Historical Documents:THE BILL OF RIGHTS</title></head>
print(f"Length-Received: {contentLength}")
print(contentReceived)
<body bgcolor="#ffffff" link="#330000" vlink="#666633">
<p><br>
</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
or abuse of its powers, that further declaratory and restrictive clauses
should be added, and as extending the ground of public confidence in the
Government will best insure the beneficent ends of its institution; </p><p> Resolved, by the Senate and House of
Representatives of the United
States of America, in Congress assembled, two-thirds of both Houses concurring,
that the following articles be proposed to the Legislatures of the several

```

```

% socket import *
serverName = 'gaia.cs.umass.edu'
serverPort = 80

adam@Fitz-Cinnamon: ~/Documents/School/CS_372/Project1

entSocket = </p><p><a name="6"><strong><h3>Amendment VI</h3></strong></a>
entSocket.c

<p></p><p>In all criminal prosecutions, the accused shall enjoy the right
to a speedy and public trial, by an impartial jury of the state
and district wherein the crime shall have been committed, which
district shall have been previously ascertained by law, and
entSocket.s to be informed of the nature and cause of the accusation;
to be confronted with the witnesses against him; to have
compulsory process for obtaining witnesses in his favor,
ent("f"\nRequ and to have the assistance of counsel for his defense.

</p><p><a name="7"><strong><h3>Amendment VII</h3></strong></a>

loop to read <p></p><p>In suits at common law, where the value in controversy shall
file True: exceed twenty dollars, the right of trial by jury shall be
contentRec: preserved, and no fact tried by a jury, shall be otherwise
reexamined in any court of the U
Length-Recieved: 712
if len(con nited States, than according
break to the rules of the common law.

<p></p><p><a name="8"><strong><h3>Amendment VIII</h3></strong></a>

print("f"\nLe <p></p><p>Excessive bail shall not be required, nor excessive fines
print(cont imposed, nor cruel and unusual punishments inflicted.

entSocket.c <p></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></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>
adam@Fitz-Cinnamon: ~/Documents/School/CS_372/Project1$

```

server.py:

A simple program to create a server. It functions by creating two sockets, the first listens for client connection requests and the second is created upon the accepting of the client connection request. This second socket then reads up to 1024 bytes of the client request and sends back data (which is predefined).

To fully run this program first start server.py script, then in your web browser, navigate to <http://localhost:5005/> to view the sent response. Upon navigating to the local host, your terminal will then display the connection information and the sent response as well.

```
our class book "Networking A Top-Down Approach" chapter 2.7 by James F. Kurose & Keith W. Ross
adam@Fitz-Cinnamon: ~/Documents/School/CS_372/Project1
python3 server.py
Traceback (most recent call last):
  File "/home/adam/Documents/School/CS_372/Project1/server.py", line 17, in <module>
    serverSocket.bind(('', serverPort))
    ~~~~~^~~~~~
OSError: [Errno 98] Address already in use
adam@Fitz-Cinnamon:~/Documents/School/CS_372/Project1$ python3 server.py
Connected to: ('127.0.0.1', 50318)
Received: b'GET / HTTP/1.1\r\nHost: localhost:5005\r\nConnection: keep-alive\r\nsec-ch-ua: "Not(A:Brand";v="8",
"Chromium";v="144", "Brave";v="144"\r\nsec-ch-ua-mobile: ?0\r\nsec-ch-ua-platform: "Linux"\r\nUpgrade-Insecure
Requests: 1\r\nUser-Agent: Mozilla/5.0 (X11; Linux x86_64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/144.0
.0.0 Safari/537.36\r\nAccept: text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/webp,image
/apng,*/*;q=0.8\r\nSec-GPC: 1\r\nAccept-Language: en-US,en;q=0.5\r\nSec-Fetch-Site: none\r\nSec-Fetch-Mode: nav
igate\r\nSec-Fetch-User: ?1\r\nSec-Fetch-Dest: document\r\nAccept-Encoding: gzip, deflate, br, zstd\r\n\r\n'
Sending >>>>>>>>
HTTP/1.1 200 OK
Content-Type: text/html; charset=UTF-8
<<<<<<<<<
<html>Congratulations! You've downloaded the first Wireshark lab file!</html>
<<<<<<<<<
Connected to: ('127.0.0.1', 50322)
Received: b'GET /favicon.ico HTTP/1.1\r\nHost: localhost:5005\r\nConnection: keep-alive\r\nsec-ch-ua-platform:
"Linux"\r\nUser-Agent: Mozilla/5.0 (X11; Linux x86_64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/144.0.0.0
Safari/537.36\r\nsec-ch-ua: "Not(A:Brand";v="8", "Chromium";v="144", "Brave";v="144"\r\nsec-ch-ua-mobile: ?0\r\n
sec-ch-ua-platform: "Linux"\r\nUpgrade-Insecure Requests: 1\r\nUser-Agent: Mozilla/5.0 (X11; Linux x86_64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/144.0.0.0 Safari/537.36\r\nAccept: text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/webp,image/apng,*/*;q=0.8\r\nSec-GPC: 1\r\nAccept-Language: en-US,en;q=0.5\r\nSec-Fetch-Site: none\r\nSec-Fetch-Mode: navigate\r\nSec-Fetch-User: ?1\r\nSec-Fetch-Dest: document\r\nAccept-Encoding: gzip, deflate, br, zstd\r\n\r\n'
```

