

Web Technology Assignment

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Part of this file was originally written in Markdown, so some of the code parts may look odd

Assignment HTTP+Design

1.1

Connection using telnet:

...

telnet reddit.com 80

...

Output:

...

Trying 151.101.65.140...

Connected to reddit.com.

Escape character is '^['.

...

Request:

```HTTP

HEAD / HTTP/1.1

host:reddit.com

...

\*Response:\*

```HTTP

HTTP/1.1 301 Moved Permanently

Retry-After: 0

Location: <https://www.reddit.com/>

Content-Length: 0

Accept-Ranges: bytes

Date: Wed, 15 Dec 2021 15:37:41 GMT

Via: 1.1 varnish

Connection: close

Cache-Control: private, max-age=3600

Strict-Transport-Security: max-age=31536000; includeSubdomains

X-Content-Type-Options: nosniff

X-Frame-Options: SAMEORIGIN

X-XSS-Protection: 1; mode=block

Server: snooserv

X-Clacks-Overhead: GNU Terry Pratchett

...

Connection using openssl:

...

openssl s_client -crLf -connect www.reddit.com:443

...

Output:

...

CONNECTED(00000003)

depth=2 C = US, O = DigiCert Inc, OU = www.digicert.com, CN = DigiCert Global Root CA

verify return:1

depth=1 C = US, O = DigiCert Inc, CN = DigiCert TLS RSA SHA256 2020 CA1

verify return:1

depth=0 C = US, ST = CALIFORNIA, L = SAN FRANCISCO, O = Reddit Inc., CN =

*.reddit.com

verify return:1

Certificate chain

0 s:C = US, ST = CALIFORNIA, L = SAN FRANCISCO, O = Reddit Inc., CN = *.reddit.com

i:C = US, O = DigiCert Inc, CN = DigiCert TLS RSA SHA256 2020 CA1

1 s:C = US, O = DigiCert Inc, CN = DigiCert TLS RSA SHA256 2020 CA1

i:C = US, O = DigiCert Inc, OU = www.digicert.com, CN = DigiCert Global Root CA

Server certificate

-----BEGIN CERTIFICATE-----

MIIGvjCCBaagAwIBAgIQBoGik7Q5uQ63ikN3LuvhuTANBgkqhkiG9w0BAQsFADBP
MQswCQYDVQQGEwJVUzEVMBMGA1UEChMMRGlnaUNlcnQgSW5jMSkwJwYDVQQDE
yBE

aWdpQ2VydCBUTFMgUINBIFNIQT11NiAyMDIwIENBMTAeFw0yMTEwMDUwMDAwMDBa
Fw0yMjA0MDIyMzU5NTIlaMGcxCzAJBgNVBAYTAiVTMRMwEQYDVQQIEwpDQUxJRk9S
TkIBMRYwFAYDVQQHEw11TQU4gRIJBTkNJU0NPMRQwEgYDVQQKEwtSZWRkaXQgSW
5j

LjEVMBMGA1UEAwwMKi5yZWRkaXQuY29tMlIiBjANBgkqhkiG9w0BAQEFAAOCAQ8A

MIIBCgKCAQEAz+maVKOKGulPLUWBcrOoi0zOK7ui1z2eaWzzMtForAMdGnBV+IZa

QtyQ5++Gfv1TbOrAOKUntMp6luNeClruZSCzltfkOpk9eHJ9XWEUPrpFFCLbBVu9

1sl0EYvdWsplUIEgilo1zdDXr0UiyU0ptz14arWfA79ESEjl3EMlCgfaumn5d9u

OQEkboWAogF0Ed53rsoVVQoW+HVFVqdUIQ0boiQBdec9IKKDB8DbAEfdCC45zVjG

zA8Hhw4fmx1I4AIDqP2tLE2qNm2GhXjctrmexVjFG2t4nyihXlIf92wvsEEGRZ8X

9pxVJTd/tfteIXPbe+u5DIE1ApPYcpfCBwlDAQABo4IDfDCCA3gwHwYDVR0jBBgw

FoAUt2ui6qiqhlx56rTaD5iyxZV2ufQwHQYDVR0OBBYEFHHgUNHngFL7IxRlnUOn

jTGqVmkmMCMGA1UdEQQcMBqCCnJIZGRpdC5jb22CDCoucMvkZGI0LmNvbTAOBgNV

HQ8BAf8EBAMCBaAwHQYDVR0IBBYwFAYIKwYBBQUHAWEGCCsGAQUFBwMCMIGPBg
NV

HR8EgYcwgyQwQKA+oDyGOMh0dHA6Ly9jcmwzLmRpZ2ljZXJ0LmNvbS9EaWdpQ2Vy

dFRMU1JTQVNIQT11NjIwMjBDQTEtNC5jcmwwQKA+oDyGOMh0dHA6Ly9jcmw0LmRp

Z2ljZXJ0LmNvbS9EaWdpQ2VydFRMU1JTQVNIQT11NjIwMjBDQTEtNC5jcmwwPgYD

VR0gBDcwNTAzBgZngQwBAglwKTAkBggBgEFBQcCARYbaHR0cDovL3d3dy5kaWdp

Y2VydC5jb20vQ1BTMH8GCCsGAQUFBwEBBHMwTAKBggrBgEFBQcwAYYYaHR0cDov

L29jc3AuZGlnaWNlcnQuY29tMEkGCCsGAQUFBzACHj1odHRwOi8vY2FjZXJ0cy5k

aWdpY2VydC5jb20vRGlnaUNlcnRUTFNSU0FTSEEyNTYyMDIwQ0ExLTEuY3J0MAwG

A1UdEwEB/wQCMAAwggF/BgorBgEEAdZ5AgQCBIIBbwSCAWsBaQB3ACI5vvCeOTkh

8FZzn2OId+W+V32cYAr4+U1dJlwlXceEAAABfFC72CcAAAQDAEgwRglhAOPvkGqz

OfXSiPNKqhmsc0c7M21/QkrpN1hcl4V20tLAIeAhqdnqhRwbHLCM+tU3okCDOx0

PV5LtF7e96gYK90TvbYAdwBRo7D1/QF5nFZtuDd4jwykeswbJ8v3nohCmg3+1IsF

5QAAAXxQu9gNAAAEAwBIMEYCIQC+O/YXHqd5PEjBJXYXIVW1VminlyF+3zNnPX1O

5fKEXQlHALCTn2R0W9ru9zNIKgXbQ+eWVA45kpLSfLvo2GJe9i5MAHUAQcjKsd8i

RkoQxqE6CUKHxk4xixsD6+tLx2jwkGKWBvYAAAF8ULvXsgAABAMARjBEAiBjxvP+

oo6SQ8pqoXSiuinzRoO32V8mCSq7H+Q8TkqQruglgJEFPFIrGZme9HncBIOHDzJXO

A+OhGc5/x3mJWW/IuEEwDQYJKoZIhvcNAQELBQADggEBABC4VDLWAFqbVjb85A/O
vn3S/I5Pv8+oOMMBZgEwh58EAxwdy0MCSjdQ5G5vrYRk7a3jtq0SNtVNIqgu722M
CyGb8IVv7Sc1AP4OHK/BpoBiLFf9vNIufBhnbG9eortk50qYUdW2/Qr8FRryv+cX
LJCXqwSqXEjWVq7b2y48bP5QkFlsGe5acxbGGtYN8hu9cXDWfHcGYPgmGYTqJIW
7Gz6UCApMZXSAS5iqIA7TWphkQJiOQut445kd60ldFwm307Wb9YoZ+h9cFHUkQWgX
35sxnMCoOR/3NzgFGwS+8E9zRUDCYldcCu7a01L3/EPZjtfKWwzKpSnCzEqJs2ZB
1sg=

-----END CERTIFICATE-----

subject=C = US, ST = CALIFORNIA, L = SAN FRANCISCO, O = Reddit Inc., CN =
*.reddit.com

issuer=C = US, O = DigiCert Inc, CN = DigiCert TLS RSA SHA256 2020 CA1

No client certificate CA names sent
Peer signing digest: SHA256
Peer signature type: RSA-PSS
Server Temp Key: X25519, 253 bits

SSL handshake has read 3513 bytes and written 386 bytes
Verification: OK

New, TLSv1.3, Cipher is TLS_AES_256_GCM_SHA384
Server public key is 2048 bit
Secure Renegotiation IS NOT supported
Compression: NONE
Expansion: NONE
No ALPN negotiated
Early data was not sent
Verify return code: 0 (ok)

Post-Handshake New Session Ticket arrived:

SSL-Session:

Protocol : TLSv1.3
Cipher : TLS_AES_256_GCM_SHA384
Session-ID:

7231C3180297F75D041801B97926862A3F79BEDE39BA796F4FA16B4FD745DD75

Session-ID-ctx:

Resumption PSK:

AF9EECF6D55F56CD2F053231F63B7217C7B84BC03E68F471DB7F8F3980366FCD49A6
B6D77EE23F687EE56F1B1A84480F

PSK identity: None

PSK identity hint: None

SRP username: None

TLS session ticket lifetime hint: 604800 (seconds)

TLS session ticket:

0000 - 25 43 7b 42 1f 3a 00 e6-2d b1 81 5c 16 36 b0 ca %C{B:...-.\.6..

0010 - c6 97 3a b4 27 60 d8 08-4b f0 7a b3 bc f6 f2 90 ...'"..K.z.....
0020 - 00 c6 63 7e 29 5e 4c 08-b4 ec 3d 8c 8a 1d f9 c7 ..c~)^L...=.....
0030 - 75 77 20 6a 76 68 11 1e-6e 78 b6 e2 55 65 c0 29 uw jvh..nx..Ue.)
0040 - a4 28 86 14 86 66 6a bf-ac 95 fc 06 8a d0 91 7c .(...fj.....|
0050 - a6 a7 eb 1c b9 06 12 57-64 a6 1b 54 d3 9b dd feWd..T....
0060 - 93 81 97 f7 80 a5 6d 5a-86 be c3 4b 6c a7 1e 5bmZ...Kl..[
0070 - 83 1a 0f b3 a1 e5 c9 e6-2d 16 e2 b4 d9 df 3e ed-.....>.
0080 - bf dc 2d ba c7 53 07 bd-5f 37 55 a5 6e b9 57 29 ..-..S.._7U.n.W)
0090 - 26 12 7e e4 de 74 bd 80-0b 9f e7 3b 48 a5 c5 1a &..~..t.....;H...

Start Time: 1639582688
Timeout : 7200 (sec)
Verify return code: 0 (ok)
Extended master secret: no
Max Early Data: 0

read R BLOCK

Request:

``HTTP

HEAD /r/TUDeIft HTTP/1.1

host:www.reddit.com

Response:

``HTTP

HTTP/1.1 200 OK

Connection: keep-alive

Cache-control: private, s-maxage=0, max-age=0, must-revalidate, no-store

Content-Type: text/html; charset=utf-8

Accept-Ranges: bytes

Date: Wed, 15 Dec 2021 15:39:07 GMT

Via: 1.1 varnish

Vary: Accept-Encoding

Set-Cookie:

loid=0000000000hlfee1mq.2.1639582745602.Z0FBQUFBQmh1Z3dadExRQ2ZiY1ZnX2Fxd
25kbExsUFIFYnRCNGhqWIFxRG5IOC1TWm91T20tTmRhOFR2THBvRIJVR0ISZnR4aGRz
SFJNTzdVbDE1OWFxcVJuRHRFRVIT0t4eUxqRnE0MVpOdFhvVDB2cjJkZnNnMkZsZmJE
ZnRPUFVIT2ExcjkzTEg; path=/; expires=Fri, 15 Dec 2023 15:39:05 GMT;
domain=.reddit.com; samesite=none; secure

Set-Cookie:

session_tracker=hrkikghhmlklaohoqf.0.1639582747292.Z0FBQUFBQmh1Z3diTWtKMdQX
2E0dEpDNjZ2OU5yVXhHQThuNVZacUxUOXpzMIBKMktVmdMejdt1B0eENha1RzLXNrYz
B0UHJJS0dEV08wMnhlUWs4UkdEalU0UUNqRUdocDZzMWttX0E3QmxOOFR6VF9oWWI1
clB6M1c5YXcwT21FSUJGbGxZSxk; path=/; domain=.reddit.com; secure; SameSite=None;
Secure

Set-Cookie:

token_v2=eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJleHAiOiJlZ2Mzk1ODYyMjUsInN1YiI6I

i01RUNEdnkzU2JDUjZRbHVGBFVH0EZ1cUF3TG9POGciLCJsb2dnZWRJbil6ZmFsc2UsInNjb3BlcyI6WylqIiwZw1haWwiLCJwaWkiXX0.Tq8FflMcU-FQwj82Z-e5yp3N01JiRVDRR1zW2q2VI6I; Path=/; Domain=reddit.com; Expires=Fri, 15 Dec 2023 15:39:05 GMT; HttpOnly; Secure
Set-Cookie: csv=2; Max-Age=63072000; Domain=.reddit.com; Path=/; Secure; SameSite=None
Set-Cookie: edgebucket=QG1s4GvDfF7NDA1jiP; Domain=reddit.com; Max-Age=63071999; Path=/; secure
Strict-Transport-Security: max-age=31536000; includeSubdomains
X-Content-Type-Options: nosniff
X-Frame-Options: SAMEORIGIN
X-XSS-Protection: 1; mode=block
Server: snooserv
X-Clacks-Overhead: GNU Terry Pratchett
...

Request:

...HTTP
GET /r/TUDelft HTTP/1.1
host:www.reddit.com
...

Response:

...HTTP
HTTP/1.1 200 OK
Connection: keep-alive
Cache-control: private, s-maxage=0, max-age=0, must-revalidate, no-store
Content-Type: text/html; charset=utf-8
Accept-Ranges: bytes
Date: Tue, 21 Dec 2021 14:45:43 GMT
Via: 1.1 varnish
Vary: Accept-Encoding
Set-Cookie:
loid=000000000hseku16v.2.1640097943049.Z0FBQUFBQmh3ZWlYZ1UzVUIhbmJ2ZS1mX2dVWVWxd242NTINUnVnN085RDNzaEVWdC1qTWHTGphQ2RxUTJmaVA0LUZSd042MXRfczYyWXp6TnRtY1poNjBJU19Pblp3SkZuNik5Zi1wUU1GRGg5R3VHUVRmRVE3UjloMDhKVVRhLXRyLTRYLk5kZm8; path=/; expires=Thu, 21 Dec 2023 14:45:43 GMT; domain=.reddit.com; samesite=none; secure
Set-Cookie:
session_tracker=nlhraqkpkjlojkpp.0.1640097943140.Z0FBQUFBQmh3ZWlYektodUtSelZaR25PN3ZzWnBDaExjTnFfUHpWaW4waE05anp0VHI5YXVCZ2VXQ3ZrYIFTVnl2VU44Y1IMUVk1Q3g0ajNydUJ5ZXILRVBJUU9tZWZ2OENsRlVwUEo0NnJ5VDZuQ2Uyb2JfNm9sN1VieHFEQ2ZEbmxa1RXaFpnV3I; path=/; domain=.reddit.com; secure; SameSite=None; Secure
Set-Cookie:
token_v2=eyJhbGciOiJIUzI1NiIsInR5cCI6IkpXVCJ9.eyJleHAiOiJlY2NDaXN0MjM1YiI6Ii1vWUowbWRjRzh6RmRfbklmSkJMTWJZaWJyZnliYiEiLCJsb2dnZWRJbil6ZmFsc2UsInNjb3BlcyI6WylqIiwZw1haWwiLCJwaWkiXX0.SvQ6l1mPfQICRgUovpzg7V43PI-jd_2mZ0ME_c

bjSkY; Path=/; Domain=reddit.com; Expires=Thu, 21 Dec 2023 14:45:43 GMT; HttpOnly; Secure
Set-Cookie: csv=2; Max-Age=63072000; Domain=.reddit.com; Path=/; Secure; SameSite=None
Set-Cookie: edgebucket=kgUmW5REGGODhUVugI; Domain=reddit.com; Max-Age=63071999; Path=/; secure
Strict-Transport-Security: max-age=31536000; includeSubdomains
X-Content-Type-Options: nosniff
X-Frame-Options: SAMEORIGIN
X-XSS-Protection: 1; mode=block
Server: snooserv
X-Clacks-Overhead: GNU Terry Pratchett
transfer-encoding: chunked

3b36

```
<!DOCTYPE html>
<html lang="en-US">
  <head>
    <!-- The rest of the HTML content goes here. (I cut it out because it is so long) -->
  </body>
</html>
```

0
...

1.2

Yes it does

1.3

```
▼ Response Headers
accept-ranges: bytes
cache-control: private, s-maxage=0, max-age=0, must-revalidate, no-store
content-encoding: gzip
content-type: text/html; charset=utf-8
date: Tue, 21 Dec 2021 17:35:13 GMT
server: snooperv
set-cookie: session_tracker=g7SWcqcp1mokJuqrPb.0.1640108112517.Z0FBQUF8Qmh3aEJRbS13TUF4TG9MbExITXN0aWxOV1k1dD1oQTZZWE9GT1cxTG9VnT19aMwG4aEd2UFBpRmR3Sz8LNmR1dw9aSmE4cU4ybEwwZko5TWJUbMYwSVJxNHpEWHJJTUxkeHhGbFFaeGo1MmFVU2dBejdtY1l1My10Q3p5SRkRHLUxIYUUhUNjU; path=/; domain=.reddit.com; secure; SameSite=None; Secure
strict-transport-security: max-age=31536000; includeSubdomains
vary: Accept-Encoding
via: 1.1 varnish
x-clacks-overhead: GNU Terry Pratchett
x-content-type-options: nosniff
x-frame-options: SAMEORIGIN
x-xss-protection: 1; mode=block

▼ Request Headers
:authority: www.reddit.com
:method: GET
:path: /r/TUDe1ft/
:scheme: https
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-GB-oxendict,en-US;q=0.9,en;q=0.8,nl-NL;q=0.7,nl;q=0.6
cache-control: max-age=0
```

The cache control header has multiple keys. The first is **private**. This means that the response may only be saved in the, private, browser cache. This is usually done for personalised pages as they are different for every user, so it does not make sense to store a cached version on the server side. The **s-maxage** key is basically the same as the **max-age** key, which is the next one. They both represent an absolute amount of time in seconds until the cached version is no longer valid. The only difference is that **s-maxage** is for shared cache, but this cache is private so this key is useless in this case. The **max-age** key is used for private cache. The value attached to the key is 0, which indicates that if the browser stores this response, it will instantly become invalid. The **must-revalidate** key means that the response can be stored in cache and can be reused while still valid. If the maximum age has been reached it should be validated with the origin server before reuse. The **no-store** key indicates that any cache of any kind should not store this response.

All in all the cache control indicates that this response shouldn't be stored.

1.4

The **accept-encoding** header in the request headers contains the types of encodings the browser supports. In this case **gzip**, **deflate** and **br**

2.1

Input

```
``bash
telnet httpbin.org 80|tee output.txt
``
```

Output

```
``bash
Trying 54.156.165.4...
Connected to httpbin.org.
Escape character is '^]'.
``
```

Request

```
``HTTP
PUT /myfile HTTP/1.1
host:httpbin.org
Content-type:text/plain
Content-length:12
<carriage return>
``
```

I could not type the content I wanted to sent. After the carriage return, the response came immediately.

Response

```
``HTTP
HTTP/1.1 404 NOT FOUND
Date: Wed, 22 Dec 2021 13:06:34 GMT
Content-Type: text/html
Content-Length: 233
Connection: keep-alive
Server: gunicorn/19.9.0
Access-Control-Allow-Origin: *
Access-Control-Allow-Credentials: true
```

```
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 3.2 Final//EN">
<title>404 Not Found</title>
<h1>Not Found</h1>
<p>The requested URL was not found on the server. If you entered the URL manually
please check your spelling and try again.</p>
``
```

The resource **/myfile** does not exist, so a 404 error is sent as a response indicating that the resource could not be found. So the creation of a new resource is not allowed.

2.2

Input

```
```bash
telnet httpbin.org 80|tee output.txt
```
```

Output

```
```bash
Trying 54.156.165.4...
Connected to httpbin.org.
Escape character is '^]'.
```
```

Request

```
```HTTP
PUT /put HTTP/1.1
host:httpbin.org
Content-type:text/plain
Content-length:11
<carriage return>
Hello World!
<carriage return>
```
```

Response

```
```HTTP
HTTP/1.1 200 OK
Date: Wed, 22 Dec 2021 13:16:59 GMT
Content-Type: application/json
Content-Length: 337
Connection: keep-alive
Server: gunicorn/19.9.0
Access-Control-Allow-Origin: *
Access-Control-Allow-Credentials: true
```

```
{
 "args": {},
 "data": "Hello World",
 "files": {},
 "form": {},
 "headers": {
 "Content-Length": "11",
 "Content-Type": "text/plain",
 "Host": "httpbin.org",
 "X-Amzn-Trace-Id": "Root=1-61c32546-3c3a09a72eadb27b6a684ac7"
 },
 "json": null,
```

```
"origin": "185.229.55.127",
"url": "http://httpbin.org/put"
}
```

HTTP/1.1 400 Bad Request

Server: awselb/2.0

Date: Wed, 22 Dec 2021 13:16:59 GMT

Content-Type: text/html

Content-Length: 122

Connection: close

```
<html>
<head><title>400 Bad Request</title></head>
<body>
<center><h1>400 Bad Request</h1></center>
</body>
</html>
...
```

It seems that if you make the content-length shorter than the content. The server thinks the whole message has been received at the 11th character and sends a response that the PUT was a success. When the 12th character is received the server realises that something went wrong and sends a 400 response.

**\*Input\***

```
```bash  
telnet httpbin.org 80|tee output.txt  
...
```

Output

```
```bash  
Trying 54.156.165.4...
Connected to httpbin.org.
Escape character is '^]'.
...
```

**\*Request\***

```
```HTTP  
PUT /put HTTP/1.1  
host:httpbin.org  
Content-type:text/plain  
Content-length:20  
<carriage return>  
Hello World!  
<carriage return>  
<carriage return>  
<carriage return>  
<carriage return>  
...
```

Response

```
```HTTP
```

```
HTTP/1.1 200 OK
Date: Wed, 22 Dec 2021 13:42:49 GMT
Content-Type: application/json
Content-Length: 354
Connection: keep-alive
Server: gunicorn/19.9.0
Access-Control-Allow-Origin: *
Access-Control-Allow-Credentials: true
```

```
{
 "args": {},
 "data": "Hello World!\r\n\r\n\r\n\r\n",
 "files": {},
 "form": {},
 "headers": {
 "Content-Length": "20",
 "Content-Type": "text/plain",
 "Host": "httpbin.org",
 "X-Amzn-Trace-Id": "Root=1-61c32b55-0a268380359393a770905da7"
 },
 "json": null,
 "origin": "185.229.55.127",
 "url": "http://httpbin.org/put"
}
...
```

In the case that you make the content-length longer than the content, you have to keep adding character until the content-length has been reached. So in this case the data contains a lot of carriage return and new line characters, because 4 carriage returns were typed in the content of the request

### 3.1

You do not have to fill in the login details again, because the browser stores these details and automatically sends them with future requests. This prevents an unnecessary request and 401 response.

### 3.2

**\*Input\***

```
```bash
telnet httpbin.org 80
...
```

Output

```
```bash
Trying 34.230.191.51...
```

Connected to httpbin.org.

Escape character is '^['.

...

\*Request\*

```HTTP

HEAD /basic-auth/user/passwd HTTP/1.1

host:httpbin.org

...

Response

...

HTTP/1.1 401 UNAUTHORIZED

Date: Mon, 10 Jan 2022 18:34:10 GMT

Content-Length: 0

Connection: keep-alive

Server: gunicorn/19.9.0

WWW-Authenticate: Basic realm="Fake Realm"

Access-Control-Allow-Origin: *

Access-Control-Allow-Credentials: true

...

Request

...

HEAD /basic-auth/user/passwd HTTP/1.1

host:httpbin.org

Authorization: Basic dXNlcjpwYXNzd2Q=

...

Response

...

HTTP/1.1 200 OK

Date: Mon, 10 Jan 2022 18:36:07 GMT

Content-Type: application/json

Content-Length: 47

Connection: keep-alive

Server: gunicorn/19.9.0

Access-Control-Allow-Origin: *

Access-Control-Allow-Credentials: true

...

A new session:

Input

```bash

telnet httpbin.org 80

...

\*Output\*

```bash

Trying 3.209.99.235...

Connected to httpbin.org.

Escape character is '^['.

...

Request

```
```HTTP
HEAD /basic-auth/user/passwd HTTP/1.1
host:httpbin.org
```

*Response*
```HTTP
HTTP/1.1 401 UNAUTHORIZED
Date: Mon, 10 Jan 2022 18:40:29 GMT
Content-Length: 0
Connection: keep-alive
Server: unicorn/19.9.0
WWW-Authenticate: Basic realm="Fake Realm"
Access-Control-Allow-Origin: *
Access-Control-Allow-Credentials: true
```
```

This is not the same behaviour as in the browser. In the browser, after requesting the page after having logged in, the required authorization was automatically sent to the server. The terminal does not save and automatically send the authorization requested after having logged in, so you have to authorize again manually.

4.1

Connect four

4.2

1. <https://connect-4.org/en>
2. <https://c4arena.com/>
3. <https://buddyboardgames.com/connect4>

All 3 versions follow the basic design principles of: “Don’t make me think”, “Minimize noise and clutter” and “If you cannot make it self-evident, make it self-explanatory”. Aesthetic-wise the first one is not pleasant to look at, while the other two looked very simplistic in a good way.

The third one wasn’t self-evident nor self-explanatory, connecting to the game is very complicated.

4.3

The third one had sound, but it was very annoying. So this is not something we want to use in our game. We also did not like the colors used in the first one. We could not join a random room in the third version, which was annoying. We liked the clean/modern design of the second and third one, the animations of the pieces falling down, the column highlighting and winning animations were nice features in the second and third versions. In the second version you could also play against an AI.

5.1

Title: Connect IV

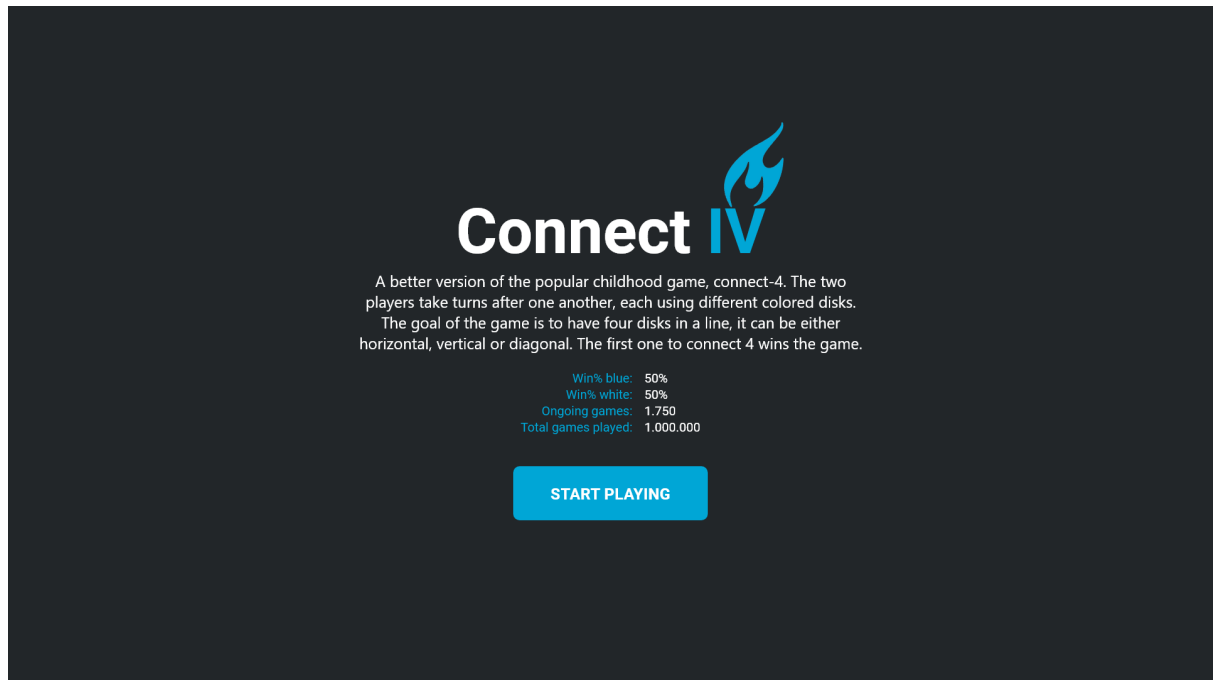
Description: A better version of the popular childhood game, connect-4. The two players take turns after one another, each using different colored disks. The goal of the game is to have four disks in a line, it can be either horizontal, vertical or diagonal. The first one to connect 4 wins the game.

Colors: #00A6D6, #222629 & #FFFFFF

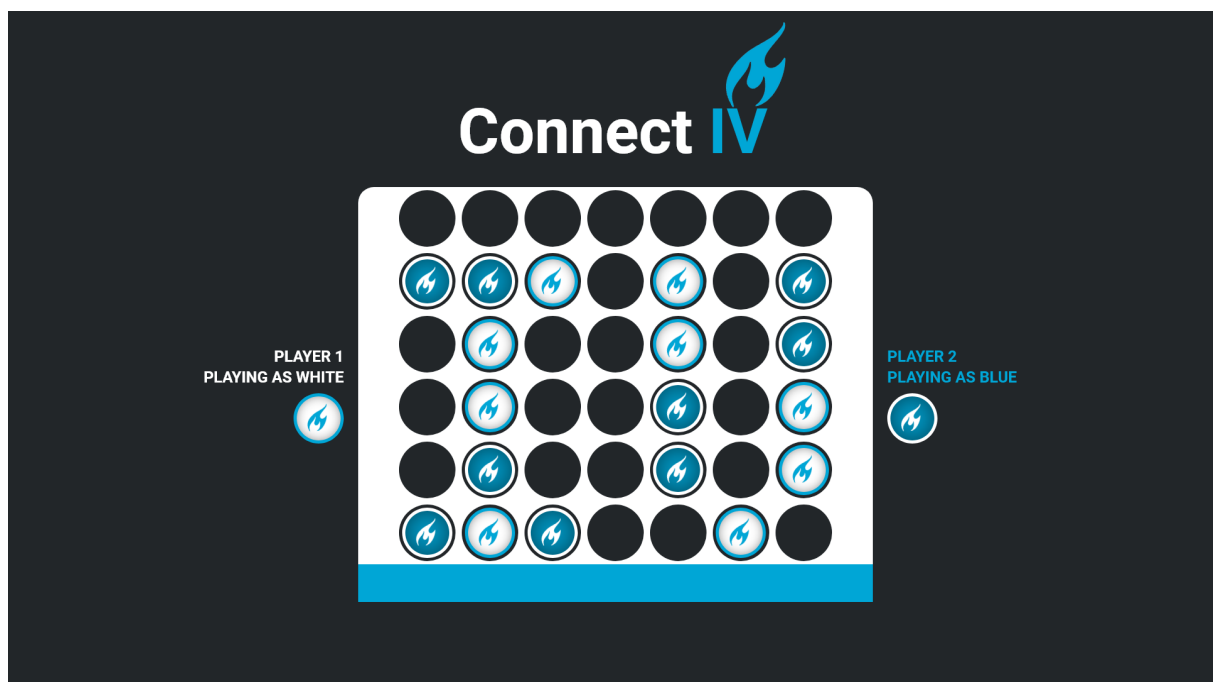
Logo:



Splash screen:



5.2



Assignment JS+Node

2.1

- Store and show statistics
- Look for other players when 'play button' is pressed

- Once game is found, game automatically starts
- Server supports multiple games at the same time
- The validity of every move is checked
- If a player drops out, the game is aborted
- If winning condition has been reached, this should be displayed to all users
- Show time since game has started
- Show countdown timer, if move takes too long
- Disk falling animation
- Column highlighting

2.2

We can create a Game object, which holds all the games values. We can make a board object which stores the current board position and we can make a disk object which holds the color and neighbours for easy win condition calculation