

Atividade AV2 – Redes

Questão 01: Servidor Web

Validação 1: O código Python foi completado com o tratamento correto do socket, requisições, 200 OK, 404 Not Found.

Evidência:

```
# Importa o módulo socket
from socket import *
import sys # Necessário para encerrar o programa

serverPort = 6789

# Cria o socket TCP (orientado à conexão)
serverSocket = socket(AF_INET, SOCK_STREAM)

# Configuração do Socket para escuta
serverSocket.bind(("", serverPort))
serverSocket.listen(1)

while True:
    # Estabelece a conexão
    print('Ready to serve...')
    # Aguarda e aceita uma nova conexão
    connectionSocket, addr = serverSocket.accept()

    try:
        # Recebe a mensagem do cliente (requisição HTTP)
        message = connectionSocket.recv(1024).decode()
        # Analisa a requisição para obter o nome do arquivo
        filename = message.split()[1]

        # Abre o arquivo local
```

```
f = open(filename[1:], encoding='utf-8')
outputdata = f.read()

# Envia a linha de status HTTP 200 OK
connectionSocket.send("HTTP/1.1 200 OK\r\n".encode())
# Envia o cabeçalho Content-Type
connectionSocket.send("Content-Type: text/html; charset=utf-8\r\n".encode())
connectionSocket.send("\r\n".encode())

# Envia o corpo do arquivo
connectionSocket.send(outputdata.encode('utf-8'))

connectionSocket.send("\r\n".encode())

# Fecha a conexão após o envio bem-sucedido
connectionSocket.close()

except IOError:
    # Tratamento de erro: Envia a linha de status 404 Not Found
    connectionSocket.send("HTTP/1.1 404 Not Found\r\n\r\n".encode())
    # Envia o corpo da mensagem de erro
    connectionSocket.send("<html><head></head><body><h1>404 Not
Found</h1></body></html>\r\n".encode())

    # Fecha a conexão após o envio do erro
    connectionSocket.close()

serverSocket.close()
sys.exit()
```

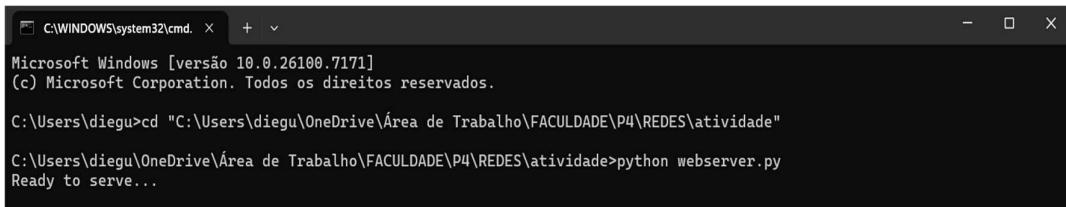
HTML/CSS:

```
<html>
  <head>
    <title>Teste do Servidor</title>
    <style>
      body{
        font-family: 'Segoe UI', Tahoma, Geneva, Verdana, sans-serif;
        background-color: #f4f4f4;
        color: #333;
        margin: 0;
        display: flex;
        justify-content: center;
        align-items: center;
        min-height: 100vh;
        flex-direction: column;
        text-align: center;
      }
      h1{
        color: #2c3e50;
        font-size: 3em;
        margin-bottom: 10px;
        text-shadow: 2px 2px 4px rgba(0,0,0,0.1);
      }
      p{
        font-size: 1.2em;
        color: #555;
      }
      .container{
        background-color: #ffffff;
        padding: 40px 60px;
      }
    </style>
  </head>
  <body>
    <h1>Hello World!</h1>
    <p>Este é o seu conteúdo.</p>
  </body>
</html>
```

```
border-radius: 12px;  
box-shadow: 0 10px 25px rgba(0, 0, 0, 0.1);  
max-width: 600px;  
width: 90%;  
}  
</style>  
</head>  
<body>  
<div class="container">  
<h1>Hello, World!</h1>  
<p>Meu servidor web está funcionando!</p>  
</div>  
</body>  
</html>
```

Validação 2: O servidor foi executado com sucesso usando o comando python webserver.py e permaneceu no modo de escuta (mensagem Ready to serve...).

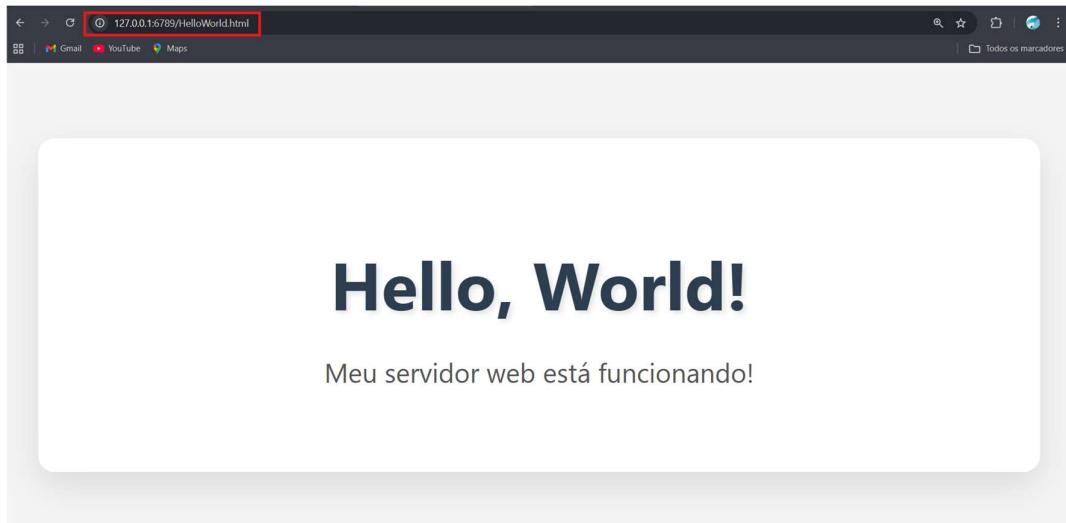
Evidência:



```
C:\WINDOWS\system32\cmd. + ×  
Microsoft Windows [versão 10.0.26100.7171]  
(c) Microsoft Corporation. Todos os direitos reservados.  
C:\Users\diegu>cd "C:\Users\diegu\OneDrive\Área de Trabalho\FACULDADE\P4\REDES\atividade"  
C:\Users\diegu\OneDrive\Área de Trabalho\FACULDADE\P4\REDES\atividade>python webserver.py  
Ready to serve...
```

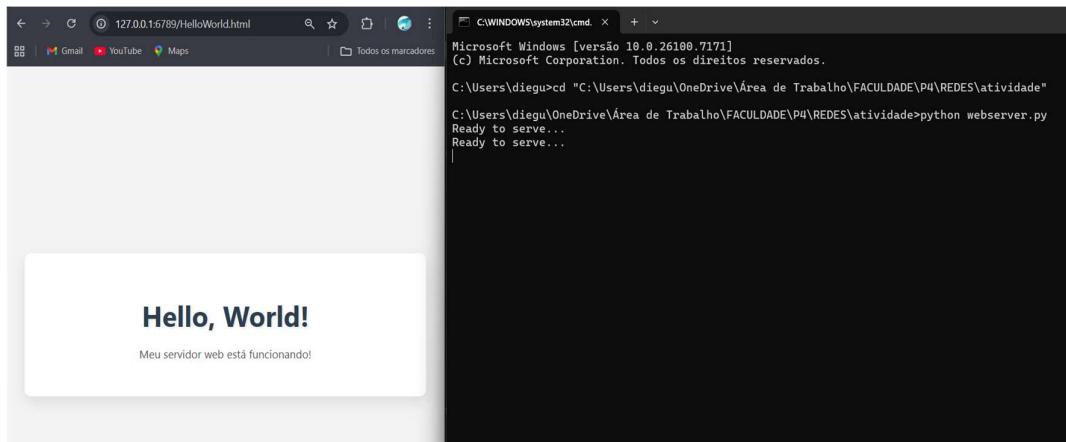
Validação 3: O servidor foi configurado para escutar na porta **6789**, conforme exigido pela atividade para evitar conflitos com outros servidores.

Evidência:



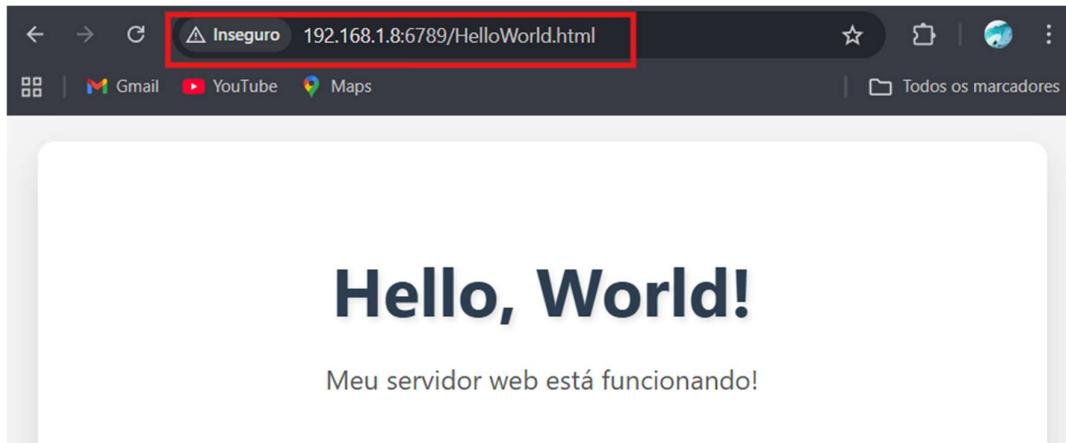
Validação 4: Foi acessada a URL `http://127.0.0.1:6789/HelloWorld.html`, e o navegador exibiu o conteúdo da página corretamente, provando que o servidor retornou o **200 OK**.

Evidência:



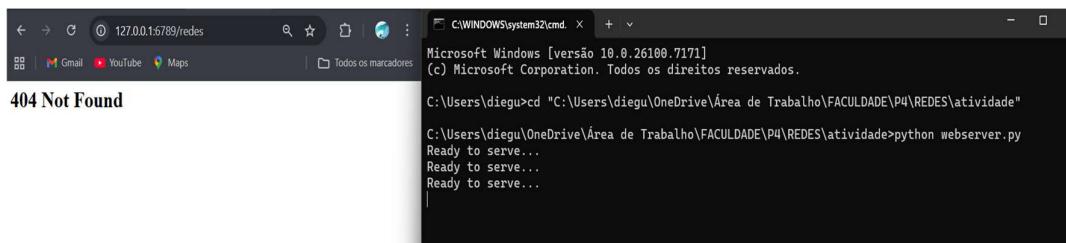
Validação 5: O servidor foi testado quanto ao requisito de acesso por hospedeiros diferentes.

Evidência:



Validação 6: Foi acessada uma URL inexistente, e o servidor respondeu corretamente com a mensagem **404 Not Found**, provando que o bloco except IOError está funcional.

Evidência:



Questão 02: Wireshark – HTTP

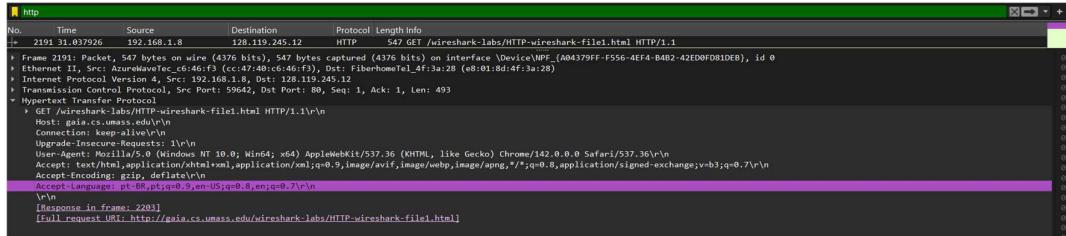
1. O Básico do GET do HTTP/interação de resposta

- a. O seu navegador está rodando a versão 1.0 ou 1.1 do HTTP? Que versão do HTTP está sendo rodada no servidor? **R: HTTP/1.1**



b. Que linguagem (se tiver) o seu navegador indica que ele pode aceitar do servidor?

R: O navegador envia o cabeçalho Accept-Language com preferência para: pt-BR (seguido de pt, en-US, en).



```
No. Time Source Destination Protocol Length Info
1 2191 31.037926 192.168.1.8 128.119.245.12 HTTP 547 GET /wireshark-labs/HTTP-wireshark-file1.html HTTP/1.1
+ Frame 2203: Packet, 547 bytes on wire (4344 bits), 547 bytes captured (4344 bits) on interface \Device\NPF_{A04379FF-F556-4EF4-B4B2-42ED0FD81DEB}, id 0
Ethernet II, Src: AzurWaveTec_c6:46:f3 (cc:47:40:c6:46:f3), Dst: FiberhomeTel_4f:3a:28 (e8:01:8d:4f:3a:28)
Internet Protocol Version 4, Src: 192.168.1.8, Dst: 128.119.245.12
Transmission Control Protocol, Src Port: 59642, Dst Port: 80, Seq: 1, Ack: 1, Len: 493
HyperText Transfer Protocol
    HTTP/1.1 200 OK\r\n
    Date: Wed, 19 Nov 2025 00:05:55 GMT\r\n
    Server: Apache/2.4.62 (AlmaLinux) OpenSSL/3.5.1 mod_fcgid/2.3.9 mod_perl/2.0.12 Perl/v5.32.1\r\n
    Last-Modified: Tue, 28 Oct 2025 05:59:01 GMT\r\n
    ETag: "88-64231b671e87"\r\n
    Accept-Ranges: bytes\r\n
    Content-Length: 128\r\n
        [Content length: 128]
```

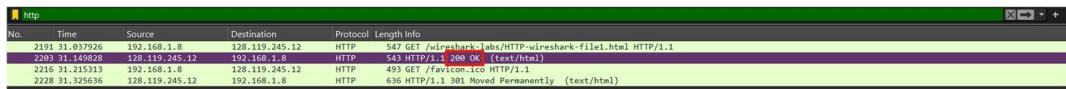
c. Qual é o endereço IP do seu computador? E do servidor gaia.cs.umass.edu?

R: IP do meu PC é o 192.168.1.8. IP do servidor destino (gaia.cs.umass.edu) é o 128.119.245.12

Source	Destination
192.168.1.8	128.119.245.12

d. Qual é o código de estado retornado pelo servidor para o seu navegador?

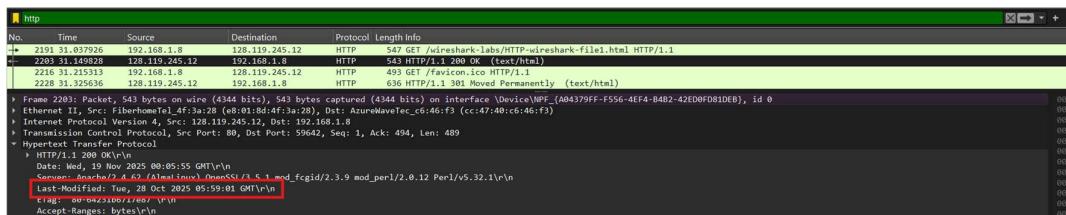
R: 200 OK



```
No. Time Source Destination Protocol Length Info
1 2191 31.037926 192.168.1.8 128.119.245.12 HTTP 547 GET /wireshark-labs/HTTP-wireshark-file1.html HTTP/1.1
2 2203 31.149928 128.119.245.12 192.168.1.8 HTTP 543 HTTP/1.1 200 OK (text/html)
3 2216 31.215213 192.168.1.8 128.119.245.12 HTTP 493 GET /favicon.ico HTTP/1.1
4 2228 31.325636 128.119.245.12 192.168.1.8 HTTP 636 HTTP/1.1 301 Moved Permanently (text/html)
```

e. Quando foi a última alteração feita no arquivo HTML?

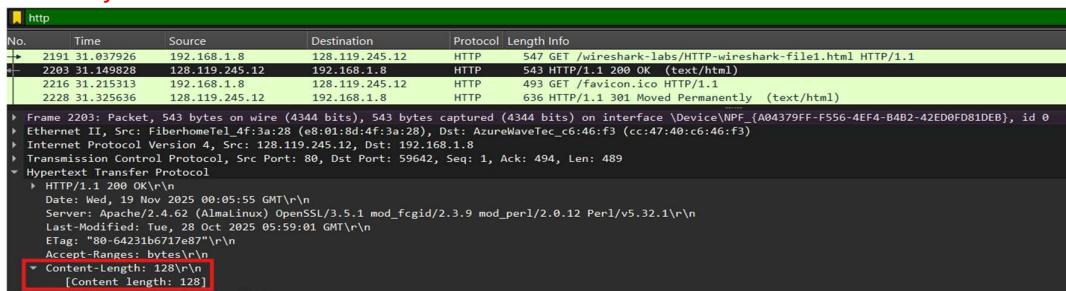
R: O cabeçalho Last-Modified indica a data da última modificação do arquivo: **Tue, 28 oct 2025 05:59:01 GMT**.



```
No. Time Source Destination Protocol Length Info
1 2191 31.037926 192.168.1.8 128.119.245.12 HTTP 547 GET /wireshark-labs/HTTP-wireshark-file1.html HTTP/1.1
2 2203 31.149928 128.119.245.12 192.168.1.8 HTTP 543 HTTP/1.1 200 OK (text/html)
3 2216 31.215213 192.168.1.8 128.119.245.12 HTTP 493 GET /favicon.ico HTTP/1.1
4 2228 31.325636 128.119.245.12 192.168.1.8 HTTP 636 HTTP/1.1 301 Moved Permanently (text/html)
+ Frame 2203: Packet, 543 bytes on wire (4344 bits), 543 bytes captured (4344 bits) on interface \Device\NPF_{A04379FF-F556-4EF4-B4B2-42ED0FD81DEB}, id 0
Ethernet II, Src: AzurWaveTec_c6:46:f3 (cc:47:40:c6:46:f3), Dst: FiberhomeTel_4f:3a:28 (e8:01:8d:4f:3a:28)
Internet Protocol Version 4, Src: 128.119.245.12, Dst: 192.168.1.8
Transmission Control Protocol, Src Port: 80, Dst Port: 59642, Seq: 1, Ack: 494, Len: 489
HyperText Transfer Protocol
    HTTP/1.1 200 OK\r\n
    Date: Wed, 19 Nov 2025 00:05:55 GMT\r\n
    Server: Apache/2.4.62 (AlmaLinux) OpenSSL/3.5.1 mod_fcgid/2.3.9 mod_perl/2.0.12 Perl/v5.32.1\r\n
    Last-Modified: Tue, 28 Oct 2025 05:59:01 GMT\r\n
    ETag: "88-64231b671e87"\r\n
    Accept-Ranges: bytes\r\n
    Content-Length: 128\r\n
        [Content length: 128]
```

f. Quantos bytes de conteúdo são retornados para o seu navegador?

R: 128 bytes



```
No. Time Source Destination Protocol Length Info
1 2191 31.037926 192.168.1.8 128.119.245.12 HTTP 547 GET /wireshark-labs/HTTP-wireshark-file1.html HTTP/1.1
2 2203 31.149928 128.119.245.12 192.168.1.8 HTTP 543 HTTP/1.1 200 OK (text/html)
3 2216 31.215213 192.168.1.8 128.119.245.12 HTTP 493 GET /favicon.ico HTTP/1.1
4 2228 31.325636 128.119.245.12 192.168.1.8 HTTP 636 HTTP/1.1 301 Moved Permanently (text/html)
+ Frame 2203: Packet, 543 bytes on wire (4344 bits), 543 bytes captured (4344 bits) on interface \Device\NPF_{A04379FF-F556-4EF4-B4B2-42ED0FD81DEB}, id 0
Ethernet II, Src: FiberhomeTel_4f:3a:28 (e8:01:8d:4f:3a:28), Dst: AzureWaveTec_c6:46:f3 (cc:47:40:c6:46:f3)
Internet Protocol Version 4, Src: 128.119.245.12, Dst: 192.168.1.8
Transmission Control Protocol, Src Port: 80, Dst Port: 59642, Seq: 1, Ack: 494, Len: 489
HyperText Transfer Protocol
    HTTP/1.1 200 OK\r\n
    Date: Wed, 19 Nov 2025 00:05:55 GMT\r\n
    Server: Apache/2.4.62 (AlmaLinux) OpenSSL/3.5.1 mod_fcgid/2.3.9 mod_perl/2.0.12 Perl/v5.32.1\r\n
    Last-Modified: Tue, 28 Oct 2025 05:59:01 GMT\r\n
    ETag: "88-64231b671e87"\r\n
    Accept-Ranges: bytes\r\n
    Content-Length: 128\r\n
        [Content length: 128]
```

g. Inspecione o conteúdo da primeira requisição GET do HTTP de seu navegador para o servidor. Você viu uma linha com “IF-MODIFIED-SINCE” no GET do HTTP?

R: Não. Como é o primeiro acesso, o navegador não tem dados de cache e não envia este cabeçalho.

```
No. Time Source Destination Protocol Length Info
272 14.442239 192.168.1.8 128.119.245.12 HTTP 547 GET /wireshark-labs/HTTP-wireshark-file2.html HTTP/1.1
302 14.554710 128.119.245.12 192.168.1.8 HTTP 787 HTTP/1.1 200 OK (text/html)
310 14.591216 192.168.1.8 128.119.245.12 HTTP 493 GET /favicon.ico HTTP/1.1

Frame 272: Packet, 547 bytes on wire (4376 bits), 547 bytes captured (4376 bits) on interface \Device\NPF_{A04379FF-F556-4EF4-B4B2-42ED0FD81DEB}, id 0
Ethernet II, Src: AzureWaveTec_c6:46:f3 (cc:47:40:c6:46:f3), Dst: FiberhomeTe_14:f3:28 (e8:01:8d:f3:3a:28)
Internet Protocol Version 4, Src: 192.168.1.8, Dst: 128.119.245.12
Transmission Control Protocol, Src Port: 56346, Dst Port: 80, Seq: 1, Ack: 1, Len: 493

HyperText Transfer Protocol
    > GET /wireshark-labs/HTTP-wireshark-file2.html HTTP/1.1\r\n
    Host: gai.cs.umass.edu\r\n
    Connection: keep-alive\r\n
    Upgrade-Insecure-Requests: 1\r\n
    User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/142.0.0.0 Safari/537.36\r\n
    Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/webp,image/png,*/*;q=0.8,application/signed-exchange;v=b3;q=0.7\r\n
    Accept-Encoding: gzip, deflate\r\n
    Accept-Language: pt-BR,pt;q=0.9,en-US;q=0.8,en;q=0.7\r\n
    \r\n
    [Response in frame: 302]
    [Full request URL: http://gai.cs.umass.edu/wireshark-labs/HTTP-wireshark-file2.html]
```

h. Inspecione o conteúdo da resposta do servidor. O servidor retornou o conteúdo do arquivo explicitamente? Como isso se observou?

R: Sim. No pacote 302, a resposta foi 200 OK e o servidor enviou o corpo do arquivo.

```
No. Time Source Destination Protocol Length Info
272 14.442239 192.168.1.8 128.119.245.12 HTTP 547 GET /wireshark-labs/HTTP-wireshark-file2.html HTTP/1.1
302 14.554710 128.119.245.12 192.168.1.8 HTTP 787 HTTP/1.1 200 OK (text/html)
310 14.591216 192.168.1.8 128.119.245.12 HTTP 493 GET /favicon.ico HTTP/1.1
333 14.702767 128.119.245.12 192.168.1.8 HTTP 636 HTTP/1.1 301 Moved Permanently (text/html)
600 37.7744165 192.168.1.8 128.119.245.12 HTTP 659 GET /wireshark-labs/HTTP-wireshark-file2.html HTTP/1.1
604 37.856898 128.119.245.12 192.168.1.8 HTTP 365 HTTP/1.1 304 Not Modified

Frame 302: Packet, 787 bytes on wire (6296 bits), 787 bytes captured (6296 bits) on interface \Device\NPF_{A04379FF-F556-4EF4-B4B2-42ED0FD81DEB}, id 0
Ethernet II, Src: FiberhomeTe_14:f3:28 (e8:01:8d:f3:3a:28), Dst: AzureWaveTec_c6:46:f3 (cc:47:40:c6:46:f3)
Internet Protocol Version 4, Src: 128.119.245.12, Dst: 192.168.1.8
Transmission Control Protocol, Src Port: 56346, Dst Port: 80, Seq: 1, Ack: 494, Len: 733

HyperText Transfer Protocol
    > HTTP/1.1 200 OK\r\n
    Date: Wed, 19 Nov 2025 01:08:51 GMT\r\n
    Server: Apache/2.4.62 (Almalinux) OpenSSL/3.5.1 mod_fcgid/2.3.9 mod_perl/2.0.12 Perl/v5.32.1\r\n
    Last-Modified: Tue, 28 Oct 2025 05:59:01 GMT\r\n
    Etag: "73-64231b67176b7"\r\n
    Accept-Ranges: bytes\r\n
    Content-Length: 371\r\n
        [Content length: 371]
    Keep-Alive\r\n
    Connection: Keep-Alive\r\n
    Content-Type: text/html; charset=UTF-8\r\n
    \r\n
    [Request in frame: 302]
    [Time since request: 112.471000 milliseconds]
    [Request URI: /wireshark-labs/HTTP-wireshark-file2.html]
    [Full request URL: http://gai.cs.umass.edu/wireshark-labs/HTTP-wireshark-file2.html]
    File Data: 371 bytes
```

i. Agora investigue o conteúdo da segunda requisição GET do HTTP de seu navegador para o servidor. Você viu uma linha com “IF-MODIFIED-SINCE” no GET do HTTP? Se sim, que informação segue o cabeçalho “IF-MODIFIED-SINCE”?

R: Sim. No pacote 600, o navegador enviou o cabeçalho condicional **If-Modified-Since com a data de **Last-Modified** da resposta anterior.**

```
No. Time Source Destination Protocol Length Info
272 14.442239 192.168.1.8 128.119.245.12 HTTP 547 GET /wireshark-labs/HTTP-wireshark-file2.html HTTP/1.1
302 14.554710 128.119.245.12 192.168.1.8 HTTP 787 HTTP/1.1 200 OK (text/html)
310 14.591216 192.168.1.8 128.119.245.12 HTTP 493 GET /favicon.ico HTTP/1.1
333 14.702767 128.119.245.12 192.168.1.8 HTTP 636 HTTP/1.1 301 Moved Permanently (text/html)
600 37.7744165 192.168.1.8 128.119.245.12 HTTP 659 GET /wireshark-labs/HTTP-wireshark-file2.html HTTP/1.1
604 37.856898 128.119.245.12 192.168.1.8 HTTP 365 HTTP/1.1 304 Not Modified

Frame 600: Packet, 659 bytes on wire (5272 bits), 659 bytes captured (5272 bits) on interface \Device\NPF_{A04379FF-F556-4EF4-B4B2-42ED0FD81DEB}, id 0
Ethernet II, Src: AzureWaveTec_c6:46:f3 (cc:47:40:c6:46:f3), Dst: FiberhomeTe_14:f3:28 (e8:01:8d:f3:3a:28)
Internet Protocol Version 4, Src: 192.168.1.8, Dst: 128.119.245.12
Transmission Control Protocol, Src Port: 56499, Dst Port: 80, Seq: 1, Ack: 1, Len: 605

HyperText Transfer Protocol
    > GET /wireshark-labs/HTTP-wireshark-file2.html HTTP/1.1\r\n
    Host: gai.cs.umass.edu\r\n
    Connection: keep-alive\r\n
    Cache-Control: max-age=0\r\n
    \r\n
    User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/142.0.0.0 Safari/537.36\r\n
    Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/webp,image/png,*/*;q=0.8,application/signed-exchange;v=b3;q=0.7\r\n
    Accept-Encoding: gzip, deflate\r\n
    Accept-Language: pt-BR,pt;q=0.9,en-US;q=0.8,en;q=0.7\r\n
    If-None-Match: "73-64231b67176b7"\r\n
    If-Modified-Since: Tue, 28 Oct 2025 05:59:01 GMT\r\n
    \r\n
    [Response in frame: 604]
    [Full request URL: http://gai.cs.umass.edu/wireshark-labs/HTTP-wireshark-file2.html]
```

j. Qual é o código de estado do HTTP e a frase retornada do servidor em resposta ao segundo GET do HTTP? O servidor explicitamente retornou o conteúdo do arquivo? Explique:

R: O servidor retornou **304 Not Modified** (pacote 604) e **não** retornou o corpo do arquivo. Isso indica que o arquivo não foi alterado, permitindo que o navegador utilize a cópia do **cache local** sem a necessidade de retransferência de dados.

```
http
No. Time Source Destination Protocol Length Info
272 14.442239 192.168.1.8 128.119.245.12 HTTP 547 GET /wireshark-labs/HTTP-wireshark-file2.html HTTP/1.1
302 14.554710 128.119.245.12 192.168.1.8 HTTP 787 HTTP/1.1 200 OK (text/html)
310 14.591216 192.168.1.8 128.119.245.12 HTTP 493 GET /favicon.ico HTTP/1.1
333 14.702767 128.119.245.12 192.168.1.8 HTTP 636 HTTP/1.1 301 Moved Permanently (text/html)
600 37.744165 192.168.1.8 128.119.245.12 HTTP 659 GET /wireshark-labs/HTTP-wireshark-file2.html HTTP/1.1
664 37.856809 128.119.245.12 192.168.1.8 HTTP 505 HTTP/1.1 304 Not Modified

Frame 640: Packet, 365 bytes on wire (2900 bits), 365 bytes captured (2920 bits) on wire by DeviceWPF-A04379FF-F556-4EFA-B4B2-42ED0FD81DEB, id 0
Ethernet II, Src: FiberHomeTel_4f:3a:28 (8:01:8d:4f:3a:28), Dst: AzureWaveTec_6:46:c3 (cc:47:40:c6:46:f3)
Internet Protocol Version 4, Src: 128.119.245.12, Dst: 192.168.1.8
Transmission Control Protocol, Src Port: 80, Dst Port: 54995, Seq: 1, Ack: 606, Len: 311
HyperText Transfer Protocol
  | HTTP/1.1 304 Not Modified
  | Date: Wed, 19 Nov 2023 01:09:14 GMT\r\n
  | Server: Apache/2.4.62 (Almalinux) OpenSSL/3.5.1 mod_fcgid/2.3.9 mod_perl/2.0.12 Perl/v5.32.1\r\n
  | Last-Modified: Tue, 28 Oct 2023 05:59:01 GMT\r\n
  | ETag: "173-23233-173-23233"\r\n
  | Accept-Ranges: bytes\r\n
  | Keep-Alive: timeout=5, max=100\r\n
  | Connection: Keep-Alive\r\n
  |
  | [Request-Line: 600]
  | [Time since request: 112.733000 milliseconds]
  | [Request URI: /wireshark-labs/HTTP-wireshark-file2.html]
  | [Full request URI: http://geaia.cs.umanus.edu/wireshark-labs/HTTP-wireshark-file2.html]
```