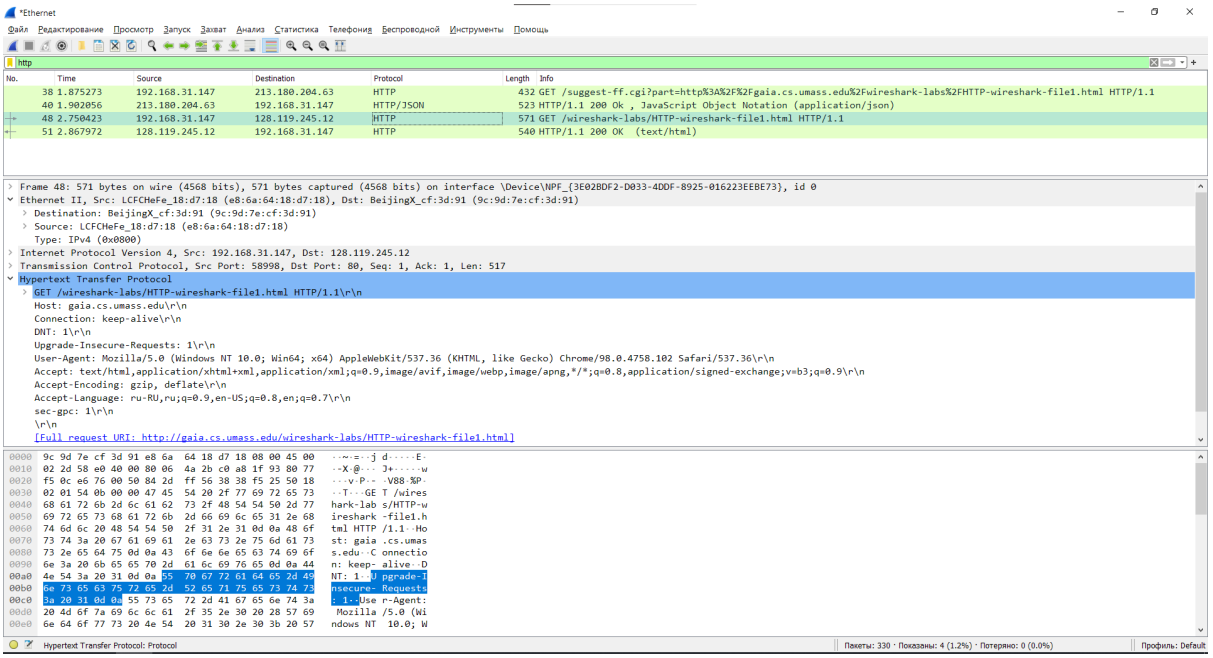
Задание 1)



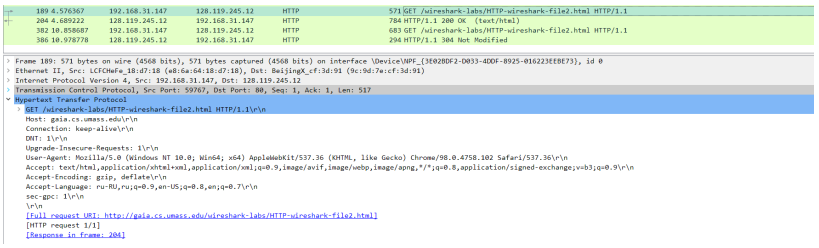
1) Используется версия HTTP 1.1, это видно в параметрах запроса
2) Принимается русский и английский, также даётся информация о доступных браузерах и о типе соединения.
3) Компьютер 192.168.31.147, сервер 128.119.245.12
4) возвращается код 200
5) Последняя модификация

```
Last-Modified: Sat, 26 Feb 2022 06:59:01 GMT\r\n
```

6) Количество контента `File Data: 128 bytes`

Вопрос 2

1) В первом GET нет “IF-MODIFIED-SINCE”



2) Да, передается явно

```
Line-based text data: text/html (10 lines)
    \n
    <html>\n
    \n
    Congratulations again!  Now you've downloaded the file lab2-2.html. <br>\n
    This file's last modification date will not change.  <p>\n
    Thus  if you download this multiple times on your browser, a complete copy <br>\n
    will only be sent once by the server due to the inclusion of the IN-MODIFIED-SINCE<br>\n
    field in your browser's HTTP GET request to the server.\n
    \n
    </html>\n
```

3) Искомая строка есть, после неё идет дата, после которой надо вернуть свежую копию страницы

```
Hypertext Transfer Protocol
  GET /wireshark-labs/HTTP-wireshark-file2.html HTTP/1.1\r\n
  Host: gaia.cs.umass.edu\r\n
  Connection: keep-alive\r\n
  Cache-Control: max-age=0\r\n
  DNT: 1\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/98.0.4758.102 Safari/537.36\r\n
  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\r\n
  Accept-Encoding: gzip, deflate\r\n
  Accept-Language: ru-RU,ru;q=0.9,en-US;q=0.8,en;q=0.7\r\n
  sec-gpc: 1\r\n
  If-None-Match: "173-5d8e659a790b5"\r\n
  If-Modified-Since: Sat, 26 Feb 2022 06:59:01 GMT\r\n
  \r\n
  [Full request URI: http://gaia.cs.umass.edu/wireshark-labs/HTTP-wireshark-file2.html]
```

4) Приходит код 304 (Not modified), новая версия страницы не передаётся

```
Hypertext Transfer Protocol
  HTTP/1.1 304 Not Modified\r\n
    [Expert Info (Chat/Sequence): HTTP/1.1 304 Not Modified\r\n]
    Response Version: HTTP/1.1
    Status Code: 304
    [Status Code Description: Not Modified]
    Response Phrase: Not Modified
  Date: Sat, 26 Feb 2022 18:38:01 GMT\r\n
  Server: Apache/2.4.6 (CentOS) OpenSSL/1.0.2k-fips PHP/7.4.27 mod_perl/2.0.11 Perl/v5.16.3\r\
  Connection: Keep-Alive\r\n
  Keep-Alive: timeout=5, max=100\r\n
  ETag: "173-5d8e659a790b5"\r\n
  \r\n
  [HTTP response 1/1]
  [Time since request: 0.120091000 seconds]
  [Request in frame: 382]
  [Request URI: http://gaia.cs.umass.edu/wireshark-labs/HTTP-wireshark-file2.html]
```

Задание 3

1) Браузер отправил лишь одно сообщение Get, его содержит 128 пакет

```
128 6.143975   192.168.31.147   128.119.245.12   HTTP   571 GET /wireshark-labs/HTTP-wireshark-file3.html HTTP/1.1
136 6.256111   128.119.245.12   192.168.31.147   HTTP   535 HTTP/1.1 200 OK  (text/html)

Frame 136: 535 bytes on wire (4280 bits), 535 bytes captured (4280 bits) on interface \Device\NPF_{3E02BDF2-D033-4DDF-8925-016223EEBE73}, id 0
Ethernet II, Src: BeijingX_cf:3d:91 (9c:9d:7e:cf:3d:91), Dst: LCFCHeFe_18:d7:18 (e8:6a:64:18:d7:18)
Internet Protocol Version 4, Src: 128.119.245.12, Dst: 192.168.31.147
Transmission Control Protocol, Src Port: 80, Dst Port: 59813, Seq: 4381, Ack: 518, Len: 481
[4 Reassembled TCP Segments (4861 bytes): #132(1460), #133(1460), #135(1460), #136(481)]
Hypertext Transfer Protocol
  HTTP/1.1 200 OK\r\n
    [Expert Info (Chat/Sequence): HTTP/1.1 200 OK\r\n]
    Response Version: HTTP/1.1
    Status Code: 200
    [Status Code Description: OK]
    Response Phrase: OK
  Date: Sat, 26 Feb 2022 18:43:07 GMT\r\n
  Server: Apache/2.4.6 (CentOS) OpenSSL/1.0.2k-fips PHP/7.4.27 mod_perl/2.0.11 Perl/v5.16.3\r\n
  Last-Modified: Sat, 26 Feb 2022 06:59:01 GMT\r\n
  ETag: "1194-5d8e659a73ac5"\r\n
  Accept-Ranges: bytes\r\n
  Content-Length: 4500\r\n
  Keep-Alive: timeout=5, max=100\r\n
  Connection: Keep-Alive\r\n

0000  e8 6a 64 18 d7 18 9c 9d  7e cf 3d 91 08 00 45 00   ·jd····· ~·=···E·
0010  02 09 f5 a9 40 00 2b 06  02 86 80 77 f5 0c c0 a8   ····@·+· ···w····
0020  1f 93 00 50 e9 a5 d5 ba  e4 82 ef 57 1f ae 50 18   ···P···· ···W··P·
0030  00 ed 88 e4 00 00 68 6d  65 6e 74 73 20 69 6e 66   ·····hm ents inf
0040  6c 69 63 74 65 64 2e 0a  0a 3c 2f 70 3e 3c 70 3e   licted.· ·</p><p>
0050  3c 61 20 6e 61 6d 65 3d  22 39 22 3e 3c 73 74 72   <a name= "9"><str
0060  6f 6e 67 3e 3c 68 33 3e  41 6d 65 6e 64 6d 65 6e   ong><h3> Amendmen
0070  74 20 49 58 3c 2f 68 33  3e 3c 2f 73 74 72 6f 6e   t IX</h3 ></stron
0080  67 3e 3c 2f 61 3e 0a 0a  3c 70 3e 3c 2f 70 3e 3c   g></a>·· <p></p><
0090  70 3e 54 68 65 20 65 6e  75 6d 65 72 61 74 69 6f   p>The en umeratio
00a0  6e 20 69 6e 20 74 68 65  20 43 6f 6e 73 74 69 74   n in the  Constit
00b0  75 74 69 6f 6e 2c 20 6f  66 20 63 65 72 74 61 69   ution, o f certai
00c0  6e 20 72 69 67 68 74 73  2c 20 73 68 61 6c 6c 0a   n rights , shall·
00d0  6e 6f 74 20 62 65 20 63  6f 6e 73 74 72 75 65 64   not be c onstrued

Frame (535 bytes)   Reassembled TCP (4861 bytes)
wireshark_EthernetL3OZH1.pcapng   Пакеты: 655 · Показаны: 2 (0.3%) · Потеряно: 0 (0.0%)   Профиль: Default
```

2) Ответ содержится в 136 пакете, можно убедиться, что в нем текст принят целиком

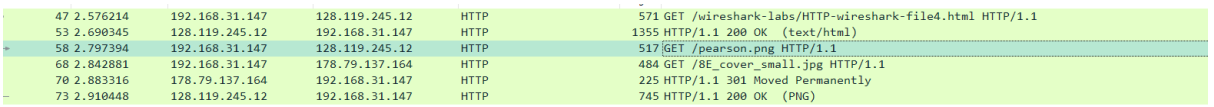
3) Потребовалось 4 сегмента TCP

```
[4 Reassembled TCP Segments (4861 bytes): #132(1460), #133(1460), #135(1460), #136(481)]
    [Frame: 132, payload: 0-1459 (1460 bytes)]
    [Frame: 133, payload: 1460-2919 (1460 bytes)]
    [Frame: 135, payload: 2920-4379 (1460 bytes)]
    [Frame: 136, payload: 4380-4860 (481 bytes)]
    [Segment count: 4]
    [Reassembled TCP length: 4861]
    [Reassembled TCP Data: 485454502f312e3120323030204f4b0d0a446174653a205361742c203236204665622032…]
```

4) Я не нашел соответствующей информации, вероятно это связано с тем, что может использоваться не только tcp и тем, что более высокий уровень не должен обладать информацией о деталях реализации (это конечно если я не ошибаюсь)

Задание 4)

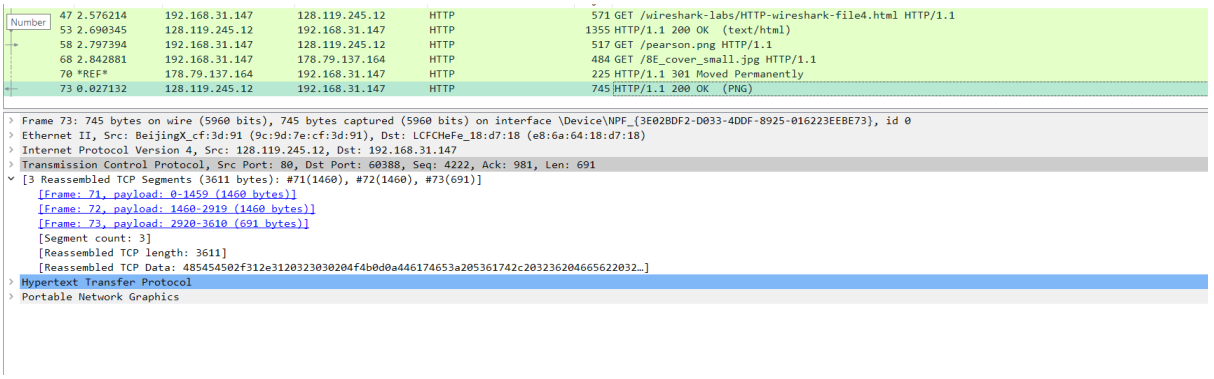
1) Было отправлено 3 гет запроса



47	2.576214	192.168.31.147	128.119.245.12	HTTP	571 GET /wireshark-labs/HTTP-wireshark-file4.html HTTP/1.1
53	2.690345	128.119.245.12	192.168.31.147	HTTP	1355 HTTP/1.1 200 OK (text/html)
58	2.797394	192.168.31.147	128.119.245.12	HTTP	517 GET /pearson.png HTTP/1.1
68	2.842881	192.168.31.147	178.79.137.164	HTTP	484 GET /8E_cover_small.jpg HTTP/1.1
70	2.883316	178.79.137.164	192.168.31.147	HTTP	225 HTTP/1.1 301 Moved Permanently
73	2.910448	128.119.245.12	192.168.31.147	HTTP	745 HTTP/1.1 200 OK (PNG)

На адрес странички с лабой, а также на страницы, содержащие необходимые .png изображения

2) Информация получается последовательно, поскольку запрос на получение второго изображения был отправлен только лишь после получения первого изображения

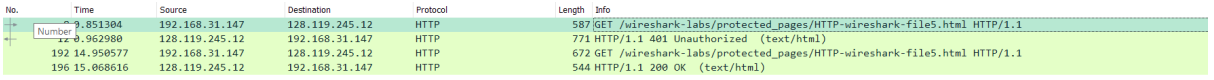


47	2.576214	192.168.31.147	128.119.245.12	HTTP	571 GET /wireshark-labs/HTTP-wireshark-file4.html HTTP/1.1
53	2.690345	128.119.245.12	192.168.31.147	HTTP	1355 HTTP/1.1 200 OK (text/html)
58	2.797394	192.168.31.147	128.119.245.12	HTTP	517 GET /pearson.png HTTP/1.1
68	2.842881	192.168.31.147	178.79.137.164	HTTP	484 GET /8E_cover_small.jpg HTTP/1.1
70	*REF*	178.79.137.164	192.168.31.147	HTTP	225 HTTP/1.1 301 Moved Permanently
73	0.027132	128.119.245.12	192.168.31.147	HTTP	745 HTTP/1.1 200 OK (PNG)

```
Frame 73: 745 bytes on wire (5960 bits), 745 bytes captured (5960 bits) on interface \Device\NPF_{3E02BDF2-D033-4DDF-8925-016223EEBE73}, id 0
Ethernet II, Src: BeijingX_cf:3d:91 (9c:9d:7e:cf:3d:91), Dst: LCFCHeFe_18:d7:18 (e8:6a:64:18:d7:18)
Internet Protocol Version 4, Src: 128.119.245.12, Dst: 192.168.31.147
Transmission Control Protocol, Src Port: 80, Dst Port: 60388, Seq: 4222, Ack: 981, Len: 691
[3 Reassembled TCP Segments (3611 bytes): #71(1460), #72(1460), #73(691)]
    [Frame: 71, payload: 0-1459 (1460 bytes)]
    [Frame: 72, payload: 1460-2919 (1460 bytes)]
    [Frame: 73, payload: 2920-3610 (691 bytes)]
    [Segment count: 3]
    [Reassembled TCP length: 3611]
    [Reassembled TCP Data: 485454502f312e3120323030204f4b0d0a446174653a205361742c203236204665622032…]
Hypertext Transfer Protocol
Portable Network Graphics
```

Задание 5)

1) Получаем ответ 401- Unauthorized



No.	Time	Source	Destination	Protocol	Length	Info
	9.851304	192.168.31.147	128.119.245.12	HTTP	587	GET /wireshark-labs/protected_pages/HTTP-wireshark-file5.html HTTP/1.1
12	0.962980	128.119.245.12	192.168.31.147	HTTP	771	HTTP/1.1 401 Unauthorized (text/html)
192	14.950577	192.168.31.147	128.119.245.12	HTTP	672	GET /wireshark-labs/protected_pages/HTTP-wireshark-file5.html HTTP/1.1
196	15.068616	128.119.245.12	192.168.31.147	HTTP	544	HTTP/1.1 200 OK (text/html)

```
Transmission Control Protocol, Src Port: 60501, Dst Port: 80, Seq: 1, Ack: 1, Len: 533
Hypertext Transfer Protocol
    GET /wireshark-labs/protected_pages/HTTP-wireshark-file5.html HTTP/1.1\r\n
        [Expert Info (Chat/Sequence): GET /wireshark-labs/protected_pages/HTTP-wireshark-file5.html HTTP/1.1\r\n]
        Request Method: GET
        Request URI: /wireshark-labs/protected_pages/HTTP-wireshark-file5.html
        Request Version: HTTP/1.1
    Host: gaia.cs.umass.edu\r\n
    Connection: keep-alive\r\n
    DNT: 1\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/98.0.4758.102 Safari/537.36\r\n
    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\r\n
    Accept-Encoding: gzip, deflate\r\n
    Accept-Language: ru-RU,ru;q=0.9,en-US;q=0.8,en;q=0.7\r\n
    sec-gpc: 1\r\n
    \r\n
    [Full request URI: http://gaia.cs.umass.edu/wireshark-labs/protected_pages/HTTP-wireshark-file5.html]
    [HTTP request 1/1]
    [Response in frame: 12]
```

2) После этого отправляется повторный запрос со строкой Authorization