Step1:

```
~/Dev/Python$ telnet www.mit.edu 80
Trying 104.92.129.105...
Connected to e9566.dscb.akamaiedge.net.
Escape character is '^]'.
GET /index.html HTTP/1.1
Host: www.mit.edu

HTTP/1.1 200 OK
Server: Apache
Last-Modified: Sat, 05 Oct 2019 04:00:21 GMT
ETag: "10e89d84-85c5-5d981555"
X-Cnection: close
Content-Type: text/html
Date: Sat, 05 Oct 2019 09:14:01 GMT
Content-Length: 34245
Connection: keep-alive

<!DOCTYPE html>
<html lang="en" class="no-js theme--custom">
  <head>
    <meta charset="utf-8" />
    <meta name="viewport" content="width=device-width, initial-scale=1.0" />
<meta http-equiv="Pragma" content="no-cache" />
<meta http-equiv="Expires" content="-1" />
<meta http-equiv="cache-control" content="no-store" />
<meta property="description" content="The mission of MIT is to advance knowledge and educate students in science, technology and other areas of scholarship that will best serve the
nation and the world in the 21st century." />
<meta property="og:site_name" content="Massachusetts Institute of Technology" />
<meta property="og:site" content="http://web.mit.edu" />
<meta property="og:type" content="website" />
<meta property="og:title" content="The Massachusetts Institute of Technology (MIT)" />
<meta property="og:url" content="http://web.mit.edu" />
<meta property="og:description" content="The mission of MIT is to advance knowledge and educate students in science, technology and other areas of scholarship that will best serve t
he nation and the world in the 21st century." />
<meta property="fb:page_id" content="126533127390327" />
<meta property="twitter:site:id" content="15460048" />
<meta property="twitter:card" content="summary" />
<meta property="twitter:site" content="@mit" />
<meta property="twitter:title" content="The Massachusetts Institute of Technology (MIT)" />
<link rel="shortcut icon" href="/themes/mit/favicon.ico" type="image/vnd.microsoft.icon" />

    <title>MIT - Massachusetts Institute of Technology</title>
```

1. What version of HTTP is the server running?

HTTP/1.1

2. How is the beginning of the content sent by the server recognized by the client?

HTTP/1.1 200 OK

3. How does the client know what type of content is returned?

Content-Type: text/html

Step3:

1. What is the format of a header line? Give a simple description that fits the headers you see.

Header is a key:value pair, the key is some descriptions that the server and client both know, the value is the value of corresponding key that describes the content of current key.
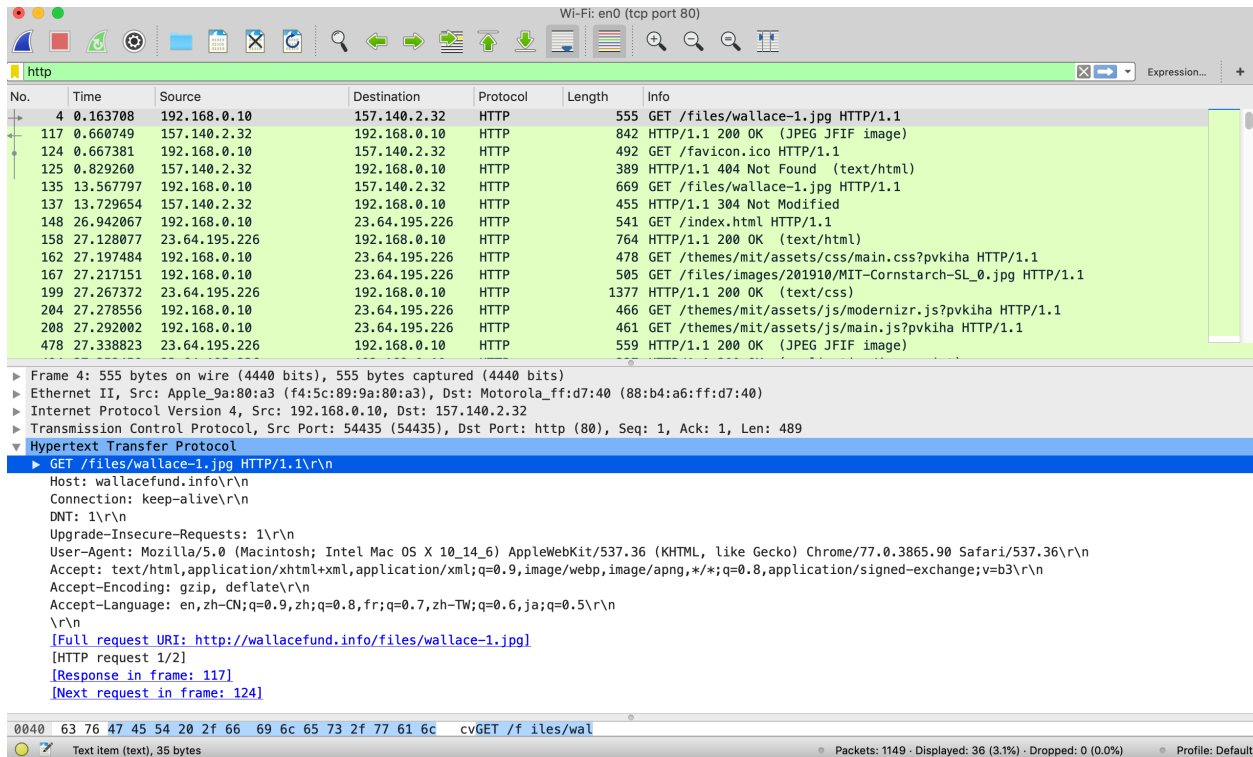
Host: wallacefund.info\r\n

The Host request header specifies the domain name of the server (for virtual hosting), and (optionally) the TCP port number on which the server is listening.

Connection: keep-alive\r\n

The Connection general header controls whether or not the network connection stays open after the current transaction finishes. If the value sent is keep-alive, the connection is persistent and not closed, allowing for subsequent requests to the same server to be done.

DNT: 1\r\n

The DNT (Do Not Track) request header indicates the user's tracking preference. It lets users indicate whether they would prefer privacy rather than personalized content.

Upgrade-Insecure-Requests: 1\r\n

The HTTP Upgrade-Insecure-Requests request header sends a signal to the server expressing the client's preference for an encrypted and authenticated response.

User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10_14_6) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/77.0.3865.90 Safari/537.36\r\n

The User-Agent request header contains a characteristic string that allows the network protocol peers to identify the application type, operating system, software vendor or software version of the requesting software user agent.

Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,image/apng,*/*;q=0.8,application/signed-exchange;v=b3\r\n

The Accept request HTTP header advertises which content types, expressed as MIME types, the client is able to understand.

Accept-Encoding: gzip, deflate\r\n

The Accept-Encoding request HTTP header advertises which content encoding, usually a compression algorithm, the client is able to understand.
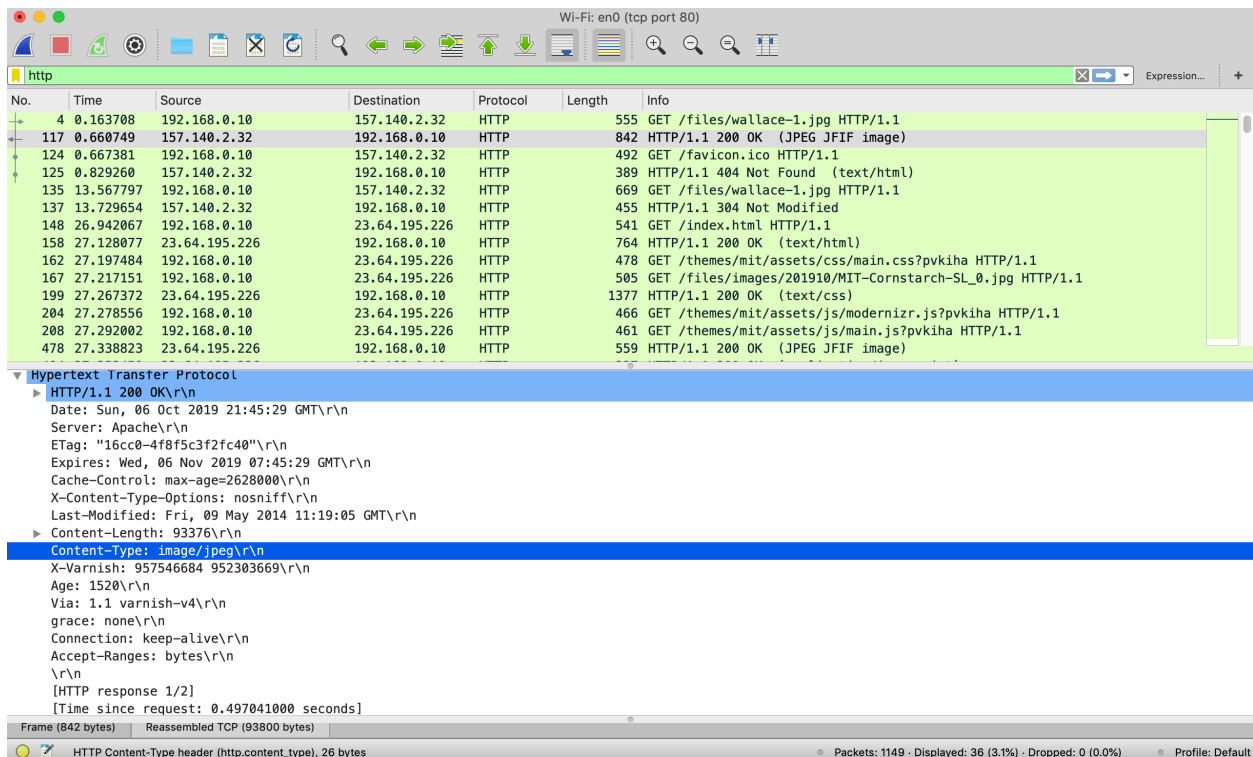
Accept-Language: en,zh-CN;q=0.9,zh;q=0.8,fr;q=0.7,zh-TW;q=0.6,ja;q=0.5\r\n

The Accept-Language request HTTP header advertises which languages the client is able to understand, and which locale variant is preferred.

2. What headers are used to indicate the kind and length of content that is returned in a response?

Indicate kind by Content-Type header.

Indicate length of content by Content-Length header.

Step4:

1. What is the name of the header the browser sends to let the server work out whether to send fresh content?

If -None-Match and If-Modified-Since:

2. Where exactly does the timestamp value carried by the header come from?

From last 200 OK response of same request:

http

No.	Time	Source	Destination	Protocol	Length	Info
4	0.163708	192.168.0.10	157.140.2.32	HTTP	555	GET /files/wallace-1.jpg HTTP/1.1
117	0.660749	157.140.2.32	192.168.0.10	HTTP	842	HTTP/1.1 200 OK (JPEG JFIF image)
124	0.667381	192.168.0.10	157.140.2.32	HTTP	492	GET /favicon.ico HTTP/1.1
125	0.829260	157.140.2.32	192.168.0.10	HTTP	389	HTTP/1.1 404 Not Found (text/html)
135	13.567797	192.168.0.10	157.140.2.32	HTTP	669	GET /files/wallace-1.jpg HTTP/1.1
137	13.729654	157.140.2.32	192.168.0.10	HTTP	455	HTTP/1.1 304 Not Modified
148	26.942067	192.168.0.10	23.64.195.226	HTTP	541	GET /index.html HTTP/1.1

Expression...

[69 Reassembled TCP Segments (93800 bytes): #6(1368), #7(1368), #8(1368), #11(1368), #12(1368), #13(1368), #16(1368), #17(1368), #18(1368), #19(1368), #23(1368)]

▼ Hypertext Transfer Protocol
  ▶ HTTP/1.1 200 OK\r\n
    Date: Sun, 06 Oct 2019 21:45:29 GMT\r\n
    Server: Apache\r\n
    ETag: "16cc0-4f8f5c3f2fc40"\r\n
    Expires: Wed, 06 Nov 2019 07:45:29 GMT\r\n
    Cache-Control: max-age=2628000\r\n
    X-Content-Type-Options: nosniff\r\n
    Last-Modified: Fri, 09 May 2014 11:19:05 GMT\r\n
  ▶ Content-Length: 93376\r\n
    Content-Type: image/jpeg\r\n
    X-Varnish: 957546684 952303669\r\n
    Age: 1520\r\n
    Via: 1.1 varnish-v4\r\n
    grace: none\r\n
    Connection: keep-alive\r\n
    Accept-Ranges: bytes\r\n
    \r\n
    [HTTP response 1/2]
    [Time since request: 0.497041000 seconds]
    [Request in frame: 4]
    [Next request in frame: 124]
    [Next response in frame: 125]
    [Request URI: http://wallacefund.info/files/wallace-1.jpg]
    File Data: 93376 bytes
▶ JPEG File Interchange Format

Frame (842 bytes) | Reassembled TCP (93800 bytes)
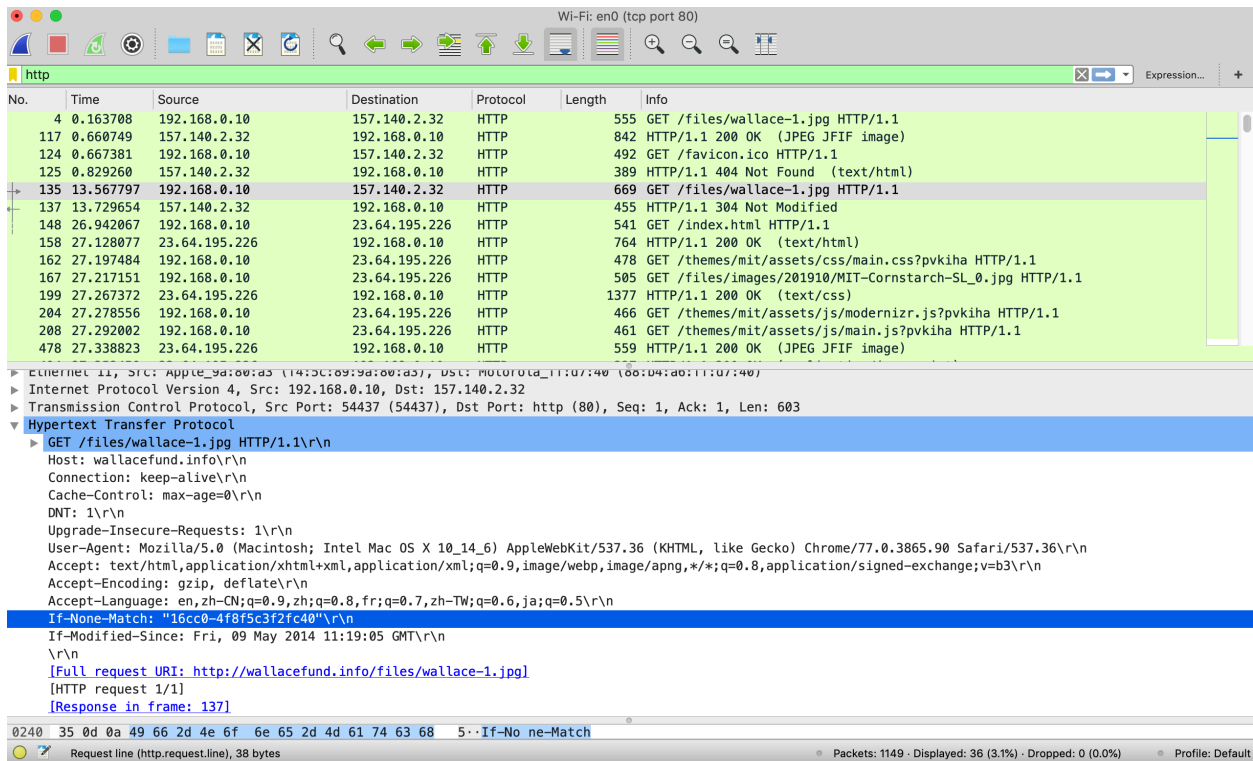
Text item (text), 17 bytes   Packets: 1149 · Displayed: 36 (3.1%) · Dropped: 0 (0.0%)   Profile: Default