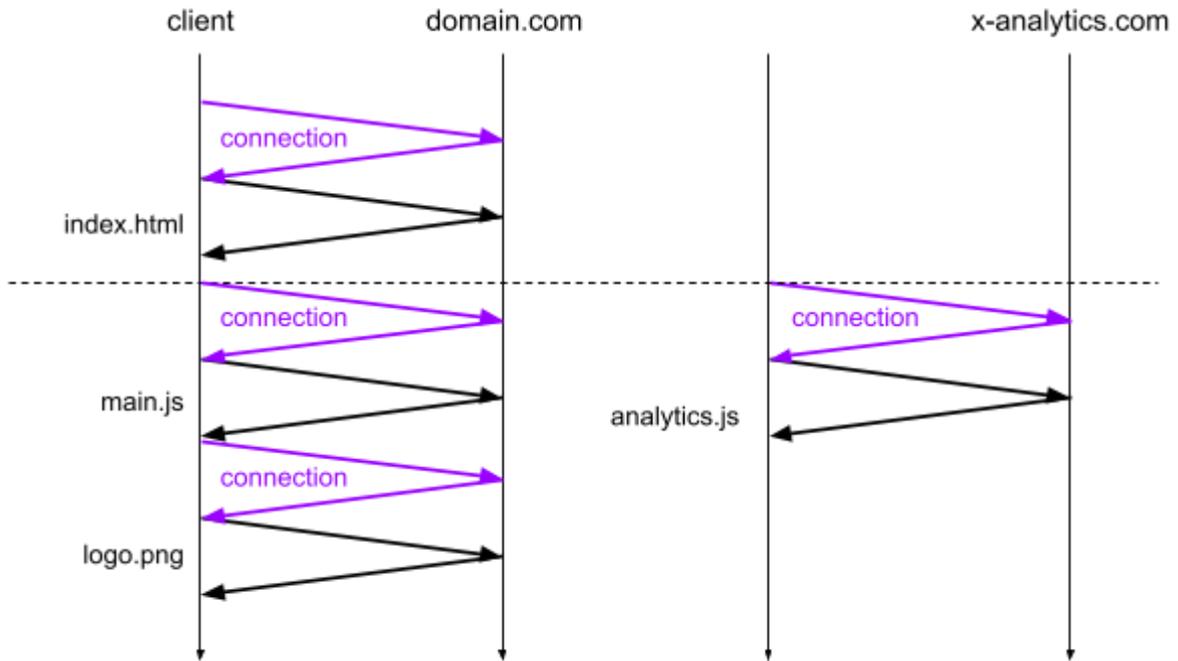


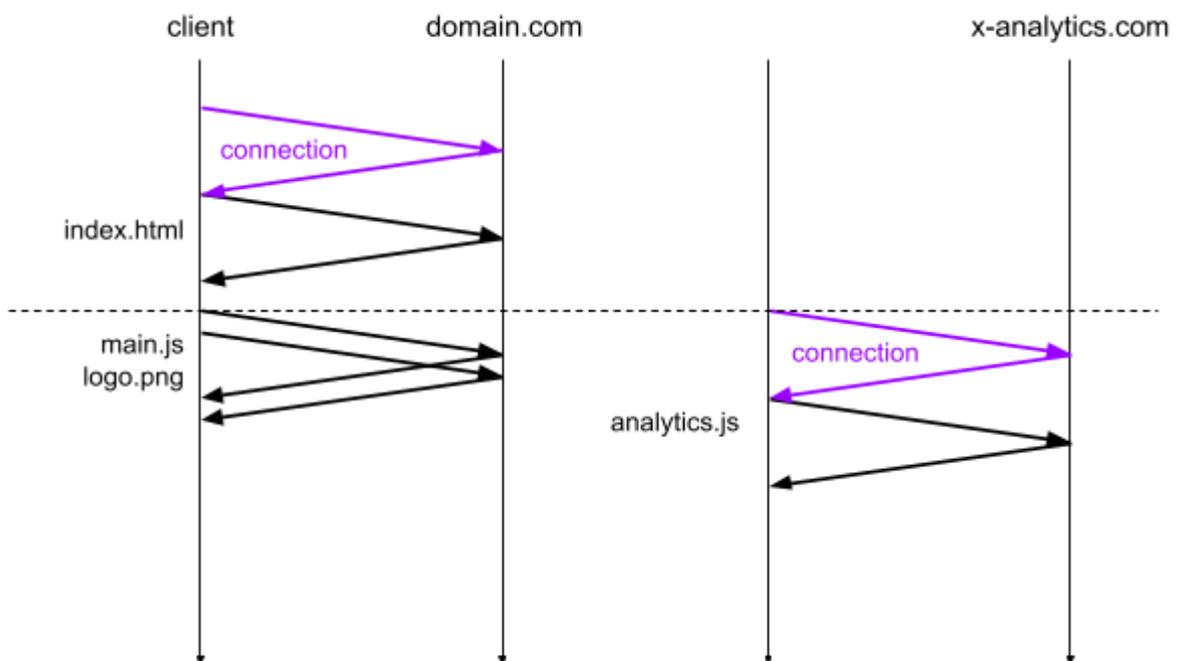
Assignment 2 "Application Layer"

Sample answers

1.1



1.2



2.1

With a single recursive query we will know either:

- The ip of domain.com
- That domain.com is unknown

2.2

With a single iterative query we will know either:

- The ip of domain.com
- That domain.com is unknown in the DNS server
- A referral of an other DNS server to query for domain.com

3.1

Prints the headers only of the http get request of the <https://www.uoc.gr/>.

3.2

```
$ curl --head https://www.uoc.gr/
```

```
HTTP/1.1 200 OK
```

```
HTTP revision HTTP/1.1 with 200 response status code and OK reason phrase.
```

```
Date: Mon, 02 Nov 2020 08:01:33 GMT
```

```
When the response was generated.
```

```
Server: Apache/2.2.34 (Unix)
```

```
The server is an Apache running on Unix.
```

```
Set-Cookie: PHPSESSID=04ca159eb1414a36daa55019d8584bcd; path=/
```

```
Suggest the client to store a cookie named 'PHPSESSID' with a specified path.
```

```
Expires: Thu, 19 Nov 1981 08:52:00 GMT
```

```
Until when the response can be considered valid.
```

```
Cache-Control: no-store, no-cache, must-revalidate, post-check=0
```

```
Pragma: no-cache
```

```
Do not cache the response.
```

```
Set-Cookie: template=basic; expires=Tue, 03-Nov-2020 14:01:33 GMT; path=/
```

```
Suggest the client to store a cookie named 'template' with a specified expiration.
```

Vary: Accept-Encoding, User-Agent

Accept-Encoding: The responses vary based on the accepted encoding provided by the user.

User-Agent: The responses vary based on the requesting user's provided agent information (os and browser).

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

The content of the response is html and the charset is UTF-8.

4.1

Looks up and prints the DNS records that match `http://www.csd.uoc.gr/`.

4.2

```
$ dig www.csd.uoc.gr | grep -v '^;'
```

```
www.csd.uoc.gr.      17      IN      CNAME  tehanu.csd.uoc.gr.
```

CNAME record which states that `www.csd.uoc.gr` is an alias of `tehanu.csd.uoc.gr`. Also the record will be valid and can be cached for the next 17 seconds.

```
tehanu.csd.uoc.gr.  42      IN      A      147.52.206.199
```

A record which states that `tehanu.csd.uoc.gr` maps to the IP `147.52.206.199`. Also the record will be valid and can be cached for the next 42 seconds.

In both records IN states the class of the record which stands for Internet.

4.3

Semantically it means that the top level domain is the root empty domain, however practically is used to distinguish between absolute domain names that end with a dot, from relative or incomplete domains that don't end with a dot.

Reference - <http://www.dns-sd.org/TrailingDotsInDomainNames.html>

5.1

Print the response from the ftp request of the `ftp://ftp.cc.uoc.gr/mirrors/linux/` and also messages sent between curl and the server with the `-v` option.

[5.2](#)

```
$ curl -v ftp://ftp.cc.uoc.gr/mirrors/linux/ 2>&1 | grep '^>'
```

- > USER anonymous
- > PASS ftp@example.com
Send the user credential where the username is 'anonymous' and the password is 'ftp@example.com'.
- > PWD
Request the current working directory.
- > CWD mirrors
Request to change the working directory to the directory 'mirrors' relative to the cwd.
- > CWD linux
Request to change the working directory to the directory 'linux' relative to the cwd.
- > EPSV
Enter extended passive mode.
- > TYPE A
Sets the transfer mode to A which stands for ASCII.
- > LIST
Request information of the current working directory.

[6.1](#)

Received: from localhost (localhost [127.0.0.1])
by **tenar.csd.uoc.gr** (Postfix) with ESMTP id 1925C2200A1
for <akritas@csd.uoc.gr>; X, X Nov 2020 11:35:45 +0200 (EET)

Received: from tenar.csd.uoc.gr ([127.0.0.1])
by localhost (tenar.csd.uoc.gr [127.0.0.1]) (**amavisd-new**, port 10024)
with ESMTP id nMJTk18ICdw4 for <akritas@csd.uoc.gr>;
X, X Nov 2020 11:35:42 +0200 (EET)

Received: by **tenar.csd.uoc.gr** (Postfix, from userid 27812)
id 8080A2200A4; X, X Nov 2020 11:35:42 +0200 (EET)

The email sent by majordomo was received by tenar.csd.uoc.gr, then it was sent to amavisd-new where it was scanned for viruses and then it was sent back to tenar.csd.uoc.gr.

6.2

The Received headers are appended by every MTA the email passes from. The sent email is a copy of the email that was sent initially from the user to the server so it has not yet passed from any MTA and therefore has no Received headers.

6.3

With an empty line.

6.4

The difference between the Date header values of the two emails is around 3 seconds, however the duration that took for our email to reach majordomo is **unknown**. We can estimate the transmit duration is (on average) equal to the transmit duration of the response which by Received header is around 3 seconds. So we can estimate that it took less than 1 second for the majordomo to compose the email.