

# Assignment 1

## Recommended readings

- <https://docs.microsoft.com/en-us/windows-server/administration/windows-commands/nslookup> or [https://man.cx/nslookup\(1\)](https://man.cx/nslookup(1))
- <https://developers.google.com/web/tools/chrome-devtools/#discover>
- <http://httpd.apache.org/docs/2.4/getting-started.html>
- <https://www.apachefriends.org/de/index.html>
- <https://developer.mozilla.org/en-US/docs/Web/HTML/Attributes>
- <https://developer.mozilla.org/en-US/docs/Web/HTML/Element/video>
- <https://developer.mozilla.org/en-US/docs/Web/HTML/Element/footer>
- <https://developer.mozilla.org/en-US/docs/Web/HTML/Element/a>

## Exercise 1 – Domain Name Service, URIs, Protocols

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Explain the idea of DNS record types and the difference between A, MX, NS, and TXT records. Use `nslookup` command line tool to find out the following information:

- a) The IP address of the server with the domain name [www.uibk.ac.at](http://www.uibk.ac.at). Additionally, find out how long your currently cached version of the corresponding record with this information is still valid and which DNS server is responsible for this zone.
- b) Explain all components of following URI:  
`https://mary:1234@www.example.com:443/forum/posts/?topic=webtec&order=latest#top`
- c) What is the difference between accessing following URI using `http` and `ftp`:  
`speedtest.tele2.net`  
Give a brief explanation of both protocols.

## Exercise 2 – HTTP Requests

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- a) Use the *Developer Tools* of your web browser (e.g., Chrome) to inspect the HTTP requests when opening the website of [www.berkeley.edu](http://www.berkeley.edu) and answer the following questions:
  - How many requests are sent, how much data is transferred, and how long does it take to load the site from the server?
  - What is the *response status code* of the first request?
  - What type of web server is serving this website?
  - What types of resources are requested?
  - Which request is the slowest?
- b) Repeat the procedure and answer the same questions for [www.aau.at](http://www.aau.at)
- c) Open up [www.google.at](http://www.google.at), clear the content of the network inspection window and enter the word “Klagenfurt” into the search field. While entering the word look at the network requests and explain what happens.

## Exercise 3 – XAMPP Setup

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Install a recent version of XAMPP (or if preferred Apache, PHP and MySQL with phpMyAdmin) on your computer and test the installation (start Apache and open the root website). Additionally, answer the following questions:

Describe the purpose of `httpd.conf` and explain the meaning of the following terms:

- ServerRoot
- DocumentRoot
- Virtual Host

What is the loopback IP address `127.0.0.1` used for?

What is the purpose of an `index.html` document?

## Exercise 4 – HTML Page 1

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Explain the notion behind HTML elements, tags and attributes. Give examples for each term.

Write a simple web page that looks as follows using HTML only (no CSS):

### This is a top-level heading

This first paragraph loads the AAU logo directly from <https://www.aau.at/>, with a square dimension of 100x100 pixels:



The second paragraph contains an ordered list with nested unordered lists:

1. First item
  - Property 1
  - Property 2
2. Second item
  - Property 1
  - Property 2
3. Third item
  - Property 1
  - Property 2

This inline-span contains a link to the website of *Alpen-Adria-Universität Klagenfurt*, opening in a new window: [Click here](#)  
Finally, this document contains a horizontal line of size 1.

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Test this page with your Apache setup by placing it into the DocumentRoot (e.g. under `PATH_TO_DOCUMENT_ROOT/a1_ex4/index.html`) and opening [http://localhost/a1\\_ex4/](http://localhost/a1_ex4/).

## Exercise 5 – HTML Page 2

What is the difference between block level and inline HTML elements? Name three examples for each of these element types. Further, open <https://developer.mozilla.org> and search for the HTML video embed element `<video>`. Explain the element's purpose as well as the attributes 'controls', 'autoplay' and 'poster'.

Create three simple pure HTML web pages (no CSS) `index.html`, `video1.html` and `video2.html` with following properties:

- For each page, the title in the browser toolbar should read 'Exercise 5 - PAGE', where PAGE should be substituted with corresponding page, i.e. 'Home', 'Video 1' and 'Video 2'. Additionally, each page should as well contain a top-level heading with the same text.
- Besides 'Home', `index.html` should contain two headings (`<h2>`) 'Video 1' and 'Video 2' with following content placed below each of them:
  - a paragraph containing corresponding video's plot (see 'paragraph' below).
  - a preview image of the video (see 'preview image' below).
  - When hovering over the image, a tooltip should read 'Start video' (note that no CSS is required here) and clicking on the image should open corresponding video page.
- `index.html` should also contain two anchor elements with the text 'Video 1'/'Video 2' placed at the very top of the page, linking to previously created video headings as well as a 'Back to top' anchor at the bottom of the page linking to the user back to the top of the page (tip: look up the description for the 'href' attribute in the anchor element documentation at <https://developer.mozilla.org>).
- Both video pages, in addition to title and heading, contain an embedded HTML video element with a specific source, a link to the Home page (`index.html`) reading 'Back to Home' and an HTML footer containing video copyright information (see descriptions below for individual video pages).
- The embedded videos should automatically start playing, have navigation controls and be displayed using a width of 640 pixels.

	Video 1 ( <code>video1.html</code> )	Video 2 ( <code>video2.html</code> )
<b>paragraph</b>	<a href="https://en.wikipedia.org/wiki/Big_Buck_Bunny">https://en.wikipedia.org/wiki/Big_Buck_Bunny</a> (Plot)	<a href="https://en.wikipedia.org/wiki/Elephants_Dream">https://en.wikipedia.org/wiki/Elephants_Dream</a> (Story Summary)
<b>preview image</b>	<a href="http://commondatastorage.googleapis.com/gtv-videos-bucket/sample/images/BigBuckBunny.jpg">http://commondatastorage.googleapis.com/gtv-videos-bucket/sample/images/BigBuckBunny.jpg</a>	<a href="http://commondatastorage.googleapis.com/gtv-videos-bucket/sample/images/ElephantsDream.jpg">http://commondatastorage.googleapis.com/gtv-videos-bucket/sample/images/ElephantsDream.jpg</a>
<b>source</b>	<a href="http://commondatastorage.googleapis.com/gtv-videos-bucket/sample/BigBuckBunny.mp4">http://commondatastorage.googleapis.com/gtv-videos-bucket/sample/BigBuckBunny.mp4</a>	<a href="http://commondatastorage.googleapis.com/gtv-videos-bucket/sample/ElephantsDream.mp4">http://commondatastorage.googleapis.com/gtv-videos-bucket/sample/ElephantsDream.mp4</a>
<b>copyright</b>	(c) copyright 2008, Blender Foundation / <a href="http://www.bigbuckbunny.org">www.bigbuckbunny.org</a>	(c) copyright 2006, Blender Foundation / Netherlands Media Art Institute / <a href="http://www.elephantsdream.org">www.elephantsdream.org</a>

Test these page with your Apache setup by placing them into the DocumentRoot (e.g. under `PATH_TO_DOCUMENT_ROOT/a1_ex5/*.html`) and opening [http://localhost/a1\\_ex5/](http://localhost/a1_ex5/).