HTML

MPRI 2.26.2: Web Data Management

Antoine Amarilli

General presentation

- HyperText Markup Language
- Describes a Web page (not the only kind of Web content...)
- Normalized by the W3C (industry+academia) and WHATWG
- Language with tags, giving the structure and content of the document
- For presentation, we will see CSS
- For dynamic behavior, there is JavaScript
- Main version: HTML5 (also older versions, XHTML, etc.)
- Official W3C standard: HTML5 specification (548 pages, 2014)
- Now also a living standard (WHATWG)

→ Lots of slack in how documents respect the standard or not!

Table of Contents

Markup principles

- Opening (`<em>`) and closing (`</em>`) tags:

  ```
  Here is an <em>example</em>
  ```

- Consecutive spaces are ignored:

  ```
  Doesn't

      matter!
  ```

- Self-closing tags, e.g., `<br>` (line break).
  (Or `<br/>` in XHTML.)

- Attributes :

  ```
  <p>A <a href="https://example.com/">link</a>.</p>
  ```

- Comments :

  ```
  <!-- not shown -->
  ```

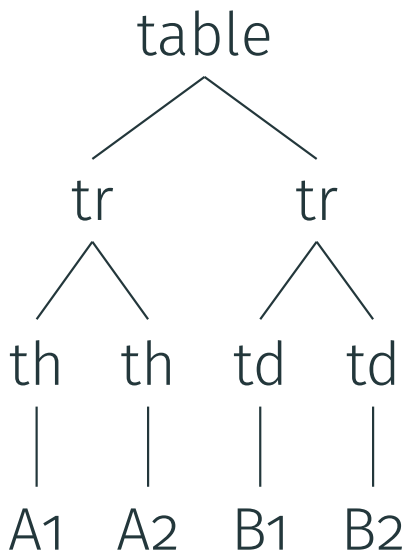
- HTML entities: special characters and escaping

  ```
  <p>&lt;p&gt;Club m&eacute;ta !&lt;/p&gt;</p>
  ```

Nesting

- Tags should be opened and closed in the correct order
  `<a><b></b></a>` and not `<a><b></a></b>`
- Rules about which tags can go where (in theory at least)
- Obvious tree interpretation (see next class about XML)

```
<table>
  <tr>
    <th>A1</th>
    <th>B1</th>
  </tr>
  <tr>
    <td>A2</td>
    <td>B2</td>
  </tr>
</table>
```



General structure

- `DOCTYPE` to indicate which HTML **version** is used (here, HTML5)
- Optional `lang` attribute (language)

```
<!DOCTYPE html>
<html lang="fr">
  <head>
    <!-- meta-information -->
  </head>
  <body>
    <!-- main document contents -->
  </body>
</html>
```

Header

- The `<head>` tag contains **metadata**:

```
<head>
  <meta charset="utf-8">
  <title>Title of the page</title>
  <meta name="description" content="blah">
  <!-- ... -->
</head>
```

- Indicate the **character encoding** (e.g., UTF-8)
- Indicate the **title**
- Other information for search engines, caching
- Also **scripts** and **CSS** (see later)

Tag soup

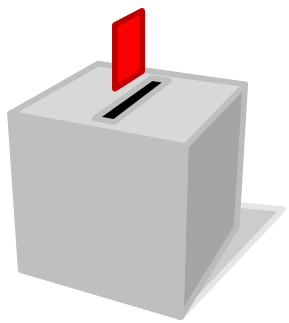
- HTML was not historically written by programmers so documents in the wild are often broken
- Web browsers are very resilient
- Validators allow you to check if your markup is correct (e.g., `validator.w3.org`)

Table of Contents

POLL: tags

Which is the modern tag that will (by default) format the text in bold?

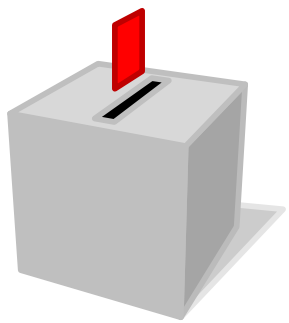
- **A**: This one: `<b>`
- **B**: This one: `<em>`
- **C**: This one: `<strong>`
- **D**: This one: `<bold>`



POLL: tags

Which is the modern tag that will (by default) format the text in bold?

- **A**: This one: `<b>`
- **B**: This one: `<em>`
- **C**: **This one:** `<strong>`
- **D**: This one: `<bold>`



Text

- Text should go in paragraphs delimited by `<p> ... </p>`
- Line break with `<br>`
- To stress some content, use:
  - → `<em> ... </em>`
  - → `<strong> ... </strong>`
  - → `<mark> ... </mark>`

Titles and structure

- Titles: from `<h1>` (main title) to `<h6>` (lowest title)
- Other tags to indicate the page structure (semantically):
  - `<header>`
  - `<footer>`
  - `<nav>`: navigation element
  - `<article>`: e.g., on a blog
  - `<main>`: main page content
  - `<dialog>`: dialog box

Lists

- A
- B
- C

```
<ul>
  <li>A</li>
  <li>B</li>
  <li>C</li>
</ul>
```

1. A
2. B
3. C

```
<ol>
  <li>A</li>
  <li>B</li>
  <li>C</li>
</ol>
```

X A

Y B

Z C

```
<dl>
  <dt>X</dt> <dd>A</dd>
  <dt>Y</dt> <dd>B</dd>
  <dt>Z</dt> <dd>C</dd>
</dl>
```

Tables

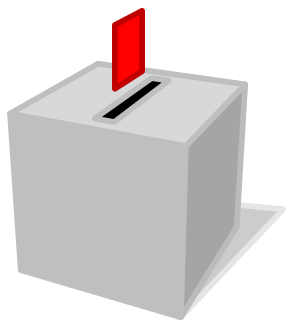
```
<table>
  <tr>
    <th>X1</th>
    <th>X2</th>
  </tr>
  <tr>
    <td>A1</td>
    <td>A2</td>
  </tr>
  <tr>
    <td>B1</td>
    <td>B2</td>
  </tr>
</table>
```

X1	X2
A1	A2
B1	B2

POLL: links

What is the correct way to link to the website of Télécom Paris?

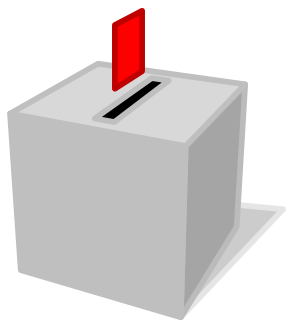
- **A**: This one: `<a href="www.telecom-paris.fr">text</a>`
- **B**: This one: `<a href="http://www.telecom-paris.fr">text</a>`
- **C**: This one: `<a href="https://www.telecom-paris.fr">text</a>`
- **D**: This one: `<a href=https://www.telecom-paris.fr>text</a>`



POLL: links

What is the correct way to link to the website of Télécom Paris?

- **A**: This one: `<a href="www.telecom-paris.fr">text</a>`
- **B**: This one: `<a href="http://www.telecom-paris.fr">text</a>`
- **C**: **This one:** `<a href="https://www.telecom-paris.fr">text</a>`
- **D**: This one: `<a href=https://www.telecom-paris.fr>text</a>`



Hypertext links (hence HTTP, HTML)

```
<a href="https://www.telecom-paris.fr/">Telecom</a>
```

The URL can be absolute (as above) or relative

On the page `https://example.com/foo/bar.html`

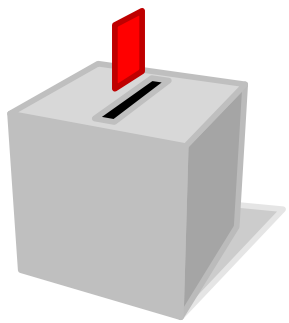
Link	Resolution
`/quux`	`https://example.com/quux`
`..`	`https://example.com/`
`bar2.html`	`https://example.com/foo/bar2.html`
`baz/toto.html`	`https://example.com/foo/baz/toto.html`
`#top`	`https://example.com/foo/bar.html#top`

- The fragment `#top` will make the browser scroll to the element with attribute `id="top"`.

POLL: request

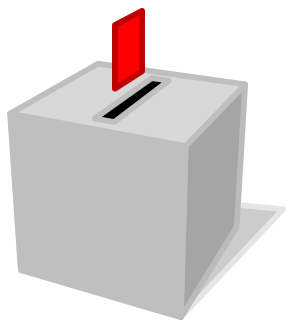
When requesting
`https://www.telecom-paris.fr/foo#bar`, which part of the URL corresponds to the path in the HTTP query?

- **A**: This one: `www.telecom-paris.fr/foo#bar`
- **B**: This one: `www.telecom-paris.fr/foo`
- **C**: This one: `/foo/#bar`
- **D**: This one: `/foo`



POLL: request

When requesting
`https://www.telecom-paris.fr/foo#bar`, which part of the URL corresponds to the path in the HTTP query?



- **A**: This one: `www.telecom-paris.fr/foo#bar`
- **B**: This one: `www.telecom-paris.fr/foo`
- **C**: This one: `/foo/#bar`
- **D**: **This one:** `/foo`

iFrames

- Display another page in the current page:

```
<iframe src="https://en.wikipedia.org/">
  <p>Sorry, your browser does not support iFrames.</p>
</iframe>
```

- Not very flexible and confusing for the user, plus security issues

Table of Contents

Images

```
<img src="logo_telecom.png" alt="Logo Telecom">
```

- `src` gives the URL of the image (absolute or relative)
- `alt` indicates a text to replace the image (required)

- To get the image, the browser will make a new query, possibly to a completely different server
- Main image formats: JPEG, PNG, GIF, SVG, WebP

Sound and video

```
<audio src="audio.ogg">
  <p>No audio support, you can
  <a href="audio.ogg">download audio.ogg</a>.</p>
</audio>
```

- Video is similar, with `<video>`
- Main **sound formats**: MP3, Opus
- Main **video formats:** H.264, WebM
- Videos require large **bandwidth**!
  - → Host them on a platform like **Youtube**
  - → Use **BitTorrent** in **JavaScript**, e.g., **Peertube** using **WebTorrent**

Table of Contents

Basics

- General structure of a form:

```
<form action="action.php" method="get">
  <!-- form contents go here -->
  <input type="submit">
</form>
```

`<input>` Control (here, a button to submit the form)

`action` URL to which we should **submit**

`method` The **HTTP method** to use when submitting

`enctype` The **encoding** for the form data

→ When submitting the form, the browser will query the `action` URL while providing the value indicated in the form fields

→ The server should then **process** this data

Back to HTTP

- GET: the data is given in the path:

```
GET action.php?first=Jean&last=Dupont HTTP/1.1
Host: example.com
```

- POST and `application/x-www-form-urlencoded` (default) : ditto but the data is in the request body:

```
POST action.php HTTP/1.1
Host: example.com
Content-Type: application/x-www-form-urlencoded

first=Jean&last=Dupont
```

Back to HTTP (cont'd)

- POST and `multipart/form-data`: less concise but more efficient when the data is large:

```
POST action.php HTTP/1.1
Host: example.com
Content-Type: multipart/form-data; boundary=--e06

----e06
Content-Disposition: form-data; name="first"

Jean
----e06
Content-Disposition: form-data; name="last"

Dupont
----e06--
```

Text fields

```
<form action="action.php" method="get">
  <label for="firstname">First name</label>
  <input name="first" id="firstname" type="text"><br>
  <label for="lastname">Last name</label>
  <input name="last" id="lastname" type="text">
  <input type="submit">
</form>
```

- The `<label>` element describes the field, its `for` attribute points to the `id` attribute of the field
- The `name` attributes indicates the name in the HTTP query:

```
POST action.php HTTP/1.1
Host: example.com
Content-Type: application/x-www-form-urlencoded

first=Jean&last=Dupont
```

Some attributes of a text field

`placeholder` **Help text** indicated when the field is empty

`value` Indicate the **default value**

`required` Must be filled in to submit the form

`type` Several kinds

- → `hidden` (not visible)
- → `password` (stars)
- → `email`
- → `range` (with `min` and `max`), `tel`, `number`, `color`…

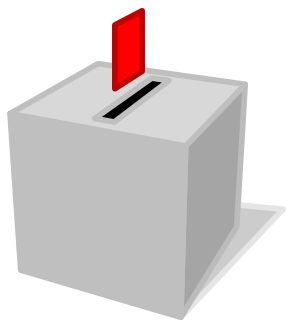
`pattern` Check with a **regular expression** (also in JS)

→ In **all cases**, client constraints (`pattern`, `required`, `hidden`, etc.) **must** be revalidated on the server!

POLL: Input validation

Which technique guarantees that the user will not change the value of a field when submitting a form

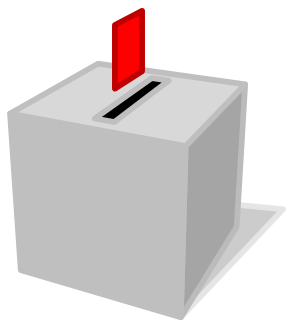
- **A**: The `disabled` attribute
- **B**: The `pattern` attribute
- **C**: Javascript validation
- **D**: Another technique



POLL: Input validation

Which technique guarantees that the user will not change the value of a field when submitting a form

- **A**: The `disabled` attribute
- **B**: The `pattern` attribute
- **C**: Javascript validation
- **D**: **Another technique**



Uploading files

- Attaching a file to the form:

```
<label for="thefile">File to submit</label>
<input type="file" name="thefile" id="thefile">
```

- Must use `post` and `multipart/form-data`!
- The maximal size should be imposed on the server
- The expected MIME type can be specified but should be revalidated

Other controls

- `<input type="submit">`: Button to submit the form
- `<textarea>`: Multiline text area
- Radio buttons (`type="radio"`), checkboxes (`type="checkbox"`), dropdown lists `<select>`...

Shorthand

Various **shorthands** to avoid writing HTML documents, e.g., **Markdown**

```
# My title

This is a *document*
with `monospace`
and here is a list:

* One
* Two

and here is a link:
[A](https://a3nm.net/)
```

```
<h1>My title</h1>

<p>This is a <em>document</em>
with <code>monospace</code>
and here is a list:</p>

<ul>
<li>One</li>
<li>Two</li>
</ul>

<p>and here is a link: <a
href="https://a3nm.net/">A</a>
</p>
```

Crédits

- Matériel de cours inspiré de notes par Pierre Senellart
- Merci à Marc Jeanmougin, Antonin Delpeuch et Pierre Senellart pour leur relecture