Comp 324/424 - Client-side Web Design

Spring Semester 2017 - Week 2

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Contents

HTML - attribute syntax - part 1

- HTML attributes follow the same design pattern as XML
- provide additional information to the parent element
- placed in the opening tag of the element
- follow the standard syntax of name and value pairs
- many different permitted legal attributes in HTML
- four common names that are permitted within most HTML elements
  - `class`, `id`, `style`, `title`

HTML - attribute syntax - part 2

Four common names permitted within most HTML elements

- `class`
  - *specifies a classname for an element*
- `id`
  - *specifies a unique ID for an element*
- `style`
  - *specifies an inline style for an element*
- `title`
  - *specifies extra information about an element*
  - *can be displayed as a tooltip by default*

NB:

- cannot use same name for two or more attributes
  - *regardless of case*
  - *on the same element start tag*

HTML - attribute syntax - part 3

A few naming rules for attributes

- empty attribute syntax
  - `<input disable>`
- unquoted attribute-value syntax
  - `<input value=yes>`
  - *value followed by `/`, at least one space character after the value and before `/`*
  - *i.e. usage with a void element...*
- single quoted attribute-value syntax
  - `<input type='checkbox'>`
- double quoted attribute-value syntax
  - `<input title="hello">`

NB:

- further specific restrictions may apply for the above
- consult W3 Docs for further details
- above examples taken from W3 Docs - Syntax Attributes Single Quoted

HTML - Doctype - HTML5

- `DOCTYPE` is a special instruction to the web browser
  - *concerning the required processing mode for rendering the document's HTML*
- doctype is a required part of the HTML document
- first part of our HTML document
- should always be included at the top of a HTML document, e.g.

```
<!DOCTYPE html>
```

or

```
<!doctype html>
```

- doctype we add for HTML5 rendering
- not a HTML element, simply tells the browser required HTML version for rendering

HTML - Character encoding - part 1

- element text, and attribute values, must consist of defined **Unicode** characters
  - *The Unicode Consortium*
  - *Unicode Information*
    - Unicode examples - many, many examples...

- as with most things, there are some exceptions
  - *for example, attribute values must not contain `U+0000` characters*
  - e.g.
    `U+0000 (NULL), U+0022 (QUOTATION MARK, "), U+0027 (APOSTROPHE, '), U+003E (GREAT`
    characters
  - e.g *W3C recommendations - 8.1.2.3*
  - *must not contain permanently undefined Unicode characters*
  - *must not contain control characters other than space characters*
    - Space - `U+0020`
    - Tab - `U+0009`
    - Line feed - `U+000A`
    - Form feed - `U+000C`
    - Carriage return - `U+000D`

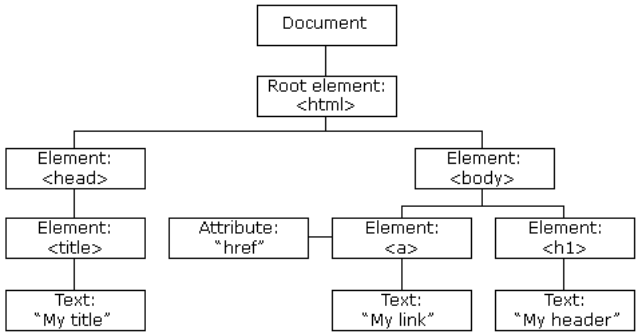
HTML - Character encoding - part 2

Basically, we use the following definable types of text for content etc.

- normal character data
  - *this includes standard text and character references*
  - *cannot include non-escaped < characters*
- replaceable character data
  - *includes elements for `title` and `textarea`*
  - *allows text, including non-escaped < characters*
  - *character references*
    - a form of markup for representing single characters
    - e.g. a dagger represented as `&dagger;` or `&#8224;` or `&#x2020;`
    - e.g. copyright symbol as `&#169`
    - lots of examples, W3 - Character Ref.

DOM Basics - intro

A brief introduction to the document object model (DOM)



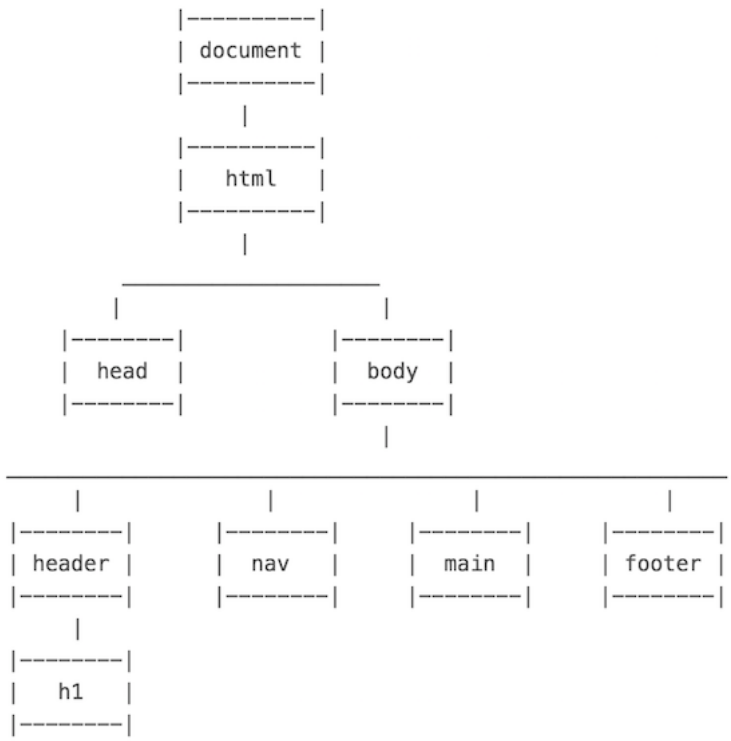
HTML DOM

- Source - W3Schools - JS HTML DOM

DOM Basics - what is DOM?

- **DOM** is a platform and language independent way
  - *to access and manipulate underlying structure of HTML document*
- structured as a representation of a tree data structure
  - *its manipulation follows this same, standard principle*
- DOM tree is constructed using a set of nodes
  - *tree is designed as a hierarchical representation of the underlying document*
- each node on our tree is an element within our HTML document
- inherent hierarchical order originates with the **root** element
  - ***root** sits at the top of our **tree***
  - *descends down following lineage from node to node*
- each node is a child to its parent
  - *we can find many siblings per node as well*
- root at the top of the tree...

Image - HTML DOM



HTML DOM

DOM Basics - useful elements

element tag	usage & description
`<html>`	container element for a HTML document
`<head>`	contains metadata and document information
`<body>`	contains main content rendered as the HTML document
`<header>`	page header...
`<nav>`	navigation, stores and defines a set of links for internal or external navigation
`<main>`	defined primary content area of document
`<footer>`	page footer...
`<section>`	a section of a page or document
`<article>`	suitable for organising and containing independent content
`<aside>`	defines content aside from the content which contains this element
`<figure>`	logical grouping of image and caption
`<img>`	image - can be local or remote using url in `src` attribute
`<figcaption>`	image caption
`<h1>, <h2>...`	headings from 1 to 6 (1 = largest)
`<a>`	anchor - link to another anchor, document, site...
`<p>`	paragraph
`<ul>, <ol>, <dl>`	unordered, ordered, definition lists
`<li>`	list item, used with `<ul>, <ol>...`
`<dt>`	definition term, used with `<dl>`
`<dd>`	definition description, used with `<dl>`
`<table>`	standard table with rows, columns...
`<tr> >`	table row, used with `<table>`
`<th>`	table heading, used with `<table>` and child to `<tr>`
`<td>`	table cell, used with `<table>` and child to `<tr>`
`<div>`	non-semantic container for content, similar concept to `<section>`
`<span>`	group inline elements in a HTML document
`<canvas>`	HTML5 element for drawing on the HTML page
`<video>`	HTML5 element for embedding video playback
`<audio>`	HTML5 element for embedding audio playback

NB: *`<div>` and `<span>` can be used as identifiers when there is no other suitable element to define parts of a HTML5 document. e.g. if there is no defined or significant semantic meaning...*

DOM Basics - sample

```
<!DOCTYPE html>
<html>
  <head>
    <base href="media/images/">
    <meta charset="UTF-8">
    <!-- week 3 - demo 1 -->
    <title>Week 3 - Demo 1</title>
  </head>
  <body>
    <header>
      <h1>Ancient Egypt</h1>
    </header>
    <nav>...</nav>
    <main>
      <section>
        <p>
          Welcome to the Ancient Egypt information site.
        </p>
        <figure>
          <img src="philae-demo2.jpg" alt="philae temple" width="333px"
          height="200px">
          <figcaption>Ptolemaic temple at Philae, Egypt</figcaption>
        </figure>
      </section>
      <aside>
        Temple at Philae in Egypt is Ptolemaic era of Egyptian history.
      </aside>
    </main>
    <footer>
      foot of the page...
    </footer>
  </body>
</html>
```

- Demo - DOM Basics - Sample

DOM Basics - `index.html` page

`index.html` usage and structure

- basic `index.html` page for loading web apps
- app will start with the `index.html` document
  - *html pages saved as `.html` or `.htm`*
  - *`.html` more common...*
- `index.html` acts as a kickstart
  - *for loading and rendering the app*
  - *loads other app resources - CSS, JS...*
- consistent elements in the HTML DOM
  - *`<html>`, `<head>`, and `<body>`*
- HTML5 apps will add
  - *`<header>`, `<main>`, and `<footer>` (when required)*
  - *many other elements for building the app...*

HTML Basics - <head> element

- part of a HTML document's metadata
- allows us to set metadata for a HTML page
- customised just for that page or replicated as a site-wide implementation
- we can add numerous additional elements to <head>
- add similar links and code for JavaScript
  - *use the <script> element & attributes such as type and src*
  - *HTML4 requires type and src*
  - *HTML5 requires src*

```
<!-- HTML4 and XHTML -->
<script type="text/javascript" src="script.js"></script>
<!-- HTML5 -->
<script src="script.js"></script>
```

- add a <title> element with text added as the element content
- set a default base address for all relative URLs in links within our HTML

```
<base href="/media/images/" target="_blank">
```

- links now simply use the base URL or override with full URL

```
<img src="image.jpg">
<a href="http://www.flickr.com">Flickr</a>
```

HTML - <head> element example

```
<head>
  <meta charset="utf-8">

  <title>Sample...</title>
  <meta name="description" content="sample metadata">
  <meta name="author" content="COMP424">

  <link href="style.css" rel="stylesheet">
  <script src="script.js"></script>

</head>
```

HTML Basics - <body> - part 1

intro

- to define the main body of the web page we use the <body> element
- headings can be created using variants of
  - *<h1>, <h2>.....<h6>*
- we can now add some simple text in a <p> element

```
<p>...</p>
```

- add a line break using the <br> element
  - *
 for strict XHTML void*
- <hr> element adds a horizontal line
  - *<hr /> for strict XHTML void*
  - *implies rendering division*
  - *instead of defined structural divide...*
- comments can also be added through our HTML

```
<!-- comment... -->
```

HTML Basics - <body> - part 2

linking

- linking is an inevitable part of web design and HTML usage
- can be considered within three different contexts
  - *linking to an external site*
  - *linking to another page within the same site*
  - *linking different parts of the same page*
- add links to text and images within the HTML
- <a> element for links plus required attributes, e.g.

```
<!-- external link -->
<a href="http://www.google.com/">Google</a>
<!-- email link -->
<a href="mailto:name@email.com">Email</a>
<!-- internal page link -->
<a href="another_page.html">another page</a>
<!-- define internal anchor - using name attribute -->
<a name="anchor">Internal anchor</a>
<!-- define internal anchor - using ID attribute -->
<a id="anchor">Anchor</a>
<!-- internal anchor link -->
<a href="#anchor">Visit internal anchor</a>
<!-- internal anchor link on another page -->
<a href="/another_page.html#anchor">Visit internal anchor</a>
<!-- internal anchor link on a page on an external site -->
<a href="https://www.test.com/test.html#anchor">Visit internal anchor on external site</a>
```

- Demo - HTML - Internal Anchor

HTML Basics - <body> - part 3

linking - cont'd

- standard attributes supported by <a> element include
  - *class, id, lang, style, title...*
- optional attributes are available for <a> element including
  - *target, href, name...*
- target attribute specifies where the link will be opened relative to the current browser window
- possible attribute values include

```
_blank
_self
_parent
_top
```

HTML Basics - <body> - part 4

images

- <img> allows us to embed an image within a web page
- <img> element requires a minimum *src* attribute

```
<img src="image.jpg" />
<img src="image.jpg">
```

- other optional attributes include
  - *class, id, alt, title, width, height...*
- use images as links
- image maps

```
<map name="textmap">
  <area shape="rect" coords="..." alt="Quote 1" href="notes1.html" />
</map>
```

HTML Basics - <body> - part 5

tables

- organise data within a table starting with the `<table>` element
- three primary child elements include
  - *table row, table header, table data*
  - *`<tr>, <th>, <td>`*

```
<table>
  <caption>424 - basic test table</caption>
  <tr>
    <th>heading 1</th>
    <th>heading 2</th>
  </tr>
  <tr>
    <td>row 1, cell 1</td>
    <td>row 2, cell 2</td>
  </tr>
</table>
```

- also add a `<caption>`
- span multiple columns using the `colspan` attribute
- span multiple rows using the `rowspan` attribute

HTML Basics - <body> - part 6

lists

- unordered list <ul>, ordered list <ol>, definition list <dl>
- and <ol> contains list items

```
<ul>
  <li>...</li>
</ul>
```

```
<ol>
  <li></li>
</ol>
```

- definition list uses <dt> for the item, and <dd> for the definition

```
<dl>
  <dt>Game 1</dt>
  <dd>our definition</dd>
</dl>
```

HTML Basics - <body> - part 7

forms

- used to capture data input by a user, which can then be processed by the server
- <form> element acts as the parent wrapper for a form
- <input> element for user input includes options using the *type* attribute
  - *text, password, radio, checkbox, submit*

```
<form>
  Text field: <input type="text" name="textfield" />
</form>
```

- process forms using
  - *e.g. JavaScript...*

HTML5 - intro

- finally became a standard in October 2014
- introduces many new features to HTML standard
- additional features include, e.g.
  - *new canvas element for drawing*
  - *video and audio support*
  - *support for local offline storage*
  - *content specific elements*
  - *including article, footer, header, nav, section*
  - *form controls such as*
  - *calendar, date, time, email, url, search*
- new input type attribute values
  - *assigned to provide better input control*
- Check browser compatibility using HTML5 Test

HTML5 - basic template

```
<!DOCTYPE html>
<html>
  <head>
    <meta charset="UTF-8">
    <title></title>
  </head>
  <body>

  </body>
</html>
```

HTML5 - Elements - part 1

- often known simply as **tags**
- elements allow us to add a form of metadata to our HTML page
- for example, we might add

```
<!-- a paragraph element -->
<p>add some paragraph content...</p>
<!-- a first heading element -->
<h1>our first heading</h1>
```

- this metadata used to apply structure to a page's content

HTML5 - Elements - part 2

- we can now add additional structure to our basic template

```
<!DOCTYPE html>
<html>
  <head>
    <meta charset="UTF-8">
    <!-- title for the web page appears in the window, tab heading... -->
    <title>Demo 1</title>
  </head>
  <body>
    <h1>Our first web page</h1>
    <p>
      As we build our web apps, more elements and content will be added...
    </p>
  </body>
</html>
```

- Demo - Our first web page

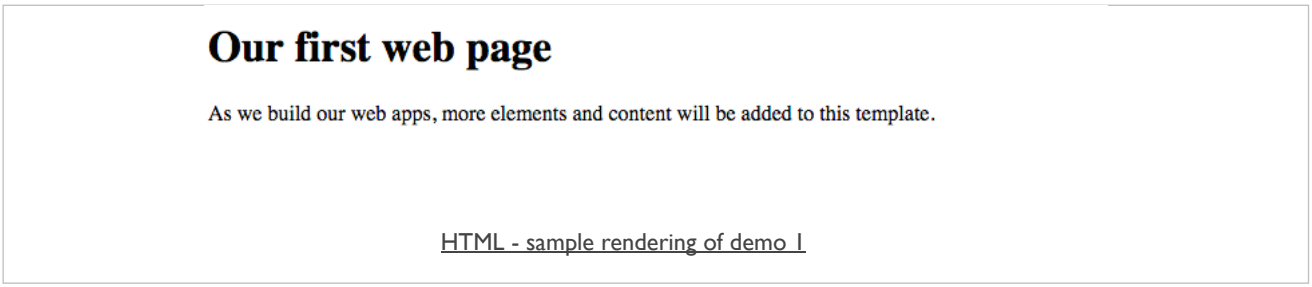
HTML5 - Comments

- comments are simple and easy to add to HTML
- add to HTML code as follows,

```
<!-- a comment in html -->
```

- comment not explicitly visible to the user in the rendered page
- comment appears in the code for reference...

Image - HTML5 sample rendering 1



Source - Demo 1

HTML5 - semantic elements - part 1

- new semantic elements added for HTML5
- known as **block-level** elements
  - *includes the following elements,*

```
<article>
<aside>
<details>
<figure>
<figcaption>
<footer>
<header>
<main>
<nav>
<section>
```

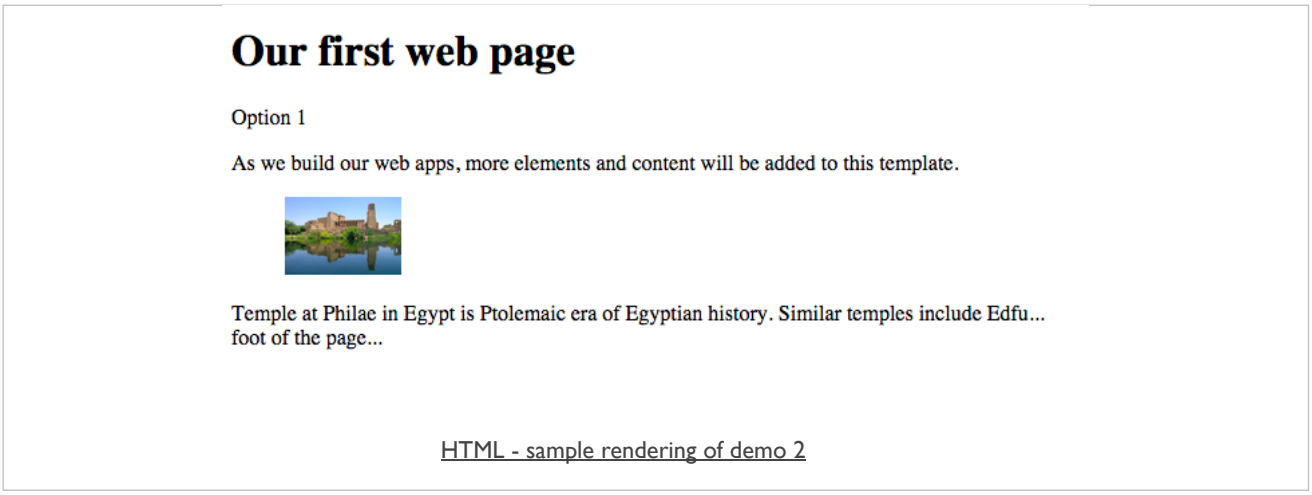
- better structure underlying documents
  - *add clear semantic divisions*

HTML5 - semantic elements - part 2

```
<!DOCTYPE html>
<html>
  <head>
    <meta charset="UTF-8">
    <!-- our second demo with lots of new elements -->
    <title>Demo 2</title>
  </head>
  <body>
    <header>
      <h1>Our first web page</h1>
    </header>
    <!-- primary navigation elements, links... -->
    <nav>Option 1</nav>
    <!-- main content -->
    <main>
      <section>
        <p>
          As we build our web apps, more elements and content will be added...
        </p>
        <figure>
          <img src="media/images/philae-demo2.jpg" alt="temple of philae" width="333px" height="200px">
        </figure>
      </section>
      <aside>
        Temple at Philae in Egypt is Ptolemaic era of Egyptian history...
      </aside>
    </main>
    <footer>
      foot of the page...
    </footer>
  </body>
</html>
```

- Demo - New elements added

Image - html5 sample rendering 2



Source - Demo - New elements added

HTML5 - semantic elements - part 3

- element tag `article` not used in previous demo
- `article` and `section` tag can both cause some confusion
- not as widely used as expected
- `div` element still widely seen in development
- HTML5 is supposed to have relegated `div`
  - *sectioning element of last resort...*
- `article` and `section`
  - *good analogy with a standard newspaper*
  - *different sections such as headlines, politics, health...*
  - *each section will also contain articles*
- HTML specification also states that an `article` element

> *represents a self-contained composition in a document, page, application, or site and that is, in principle, independently distributable or reusable, e.g. in syndication.*

HTML5 - semantic elements and structure - intro

- perceived issue or concern with HTML5 semantic elements
  - *how and when to add them to our document*
  - *where and when do we add them to our page?*
- non-semantic elements often considered simpler to apply
  - *generalised application and context for usage*

HTML5 - semantic elements and structure

header and nav

- `<header>`
  - *used to collect and contain introductory content*
  - *semantically appropriate for the head or top of a page*
  - *technically feasible and acceptable to include multiple `<header>` elements*
  - *e.g. `<header>` within main content, sidebar content, an article, a section...*
- `<nav>`
  - *short for navigation*
  - *stores and defines a set of links for internal or external navigation*
  - *not meant to define all page navigation links*
  - *often considered suitable for primary site links*
  - *additional links can be placed in*
  - *sidebar, footer, main content...*
  - *no need to consider a `<nav>` element for these links...*

HTML5 - Semantic elements and structure

main

- this element tag defines our **main** content
- traditionally the central content area of our page or document
- HTML4 often used a `<div>` element
  - *plus a `class` or `id` to define central content*
  - *e.g.*

```
<!-- e.g. HTML4 main content -->
<div id="main">
  ...
</div>
```

- HTML5 semantically defines and marks content as `<main>`
- `<main>` should not include any page features such as
  - *nav links, headers etc, that are repeated across multiple pages*
- cannot add multiple `<main>` elements to a single page
- must not be structured as a child element to
  - *`<article>`, `<aside>`, `<footer>`, `<header>`, or `<nav>`*

HTML5 - Semantic elements and structure

section, article, aside - part 1

- `<section>`
  - *defines a section of a page or document*
  - *W3C Documentation defines as follows,*

> *a section is a thematic grouping of content. The theme of each section should be identified, typically by including a heading as a child of the section element.*

- a site can be sub-divided into multiple `<section>` groupings
  - *e.g. as we might consider a chapter or section break in a book...*
- `<article>`
  - *suitable for organising and containing independent content*
  - *include multiple `<article>` elements within a page*
  - *use to establish logical, individual groups of content*
  - *again, newspaper analogy is useful to remember*
  - *e.g. a blog post, story, news report...might be a useful article*
  - *key to using this element is often whether content can be used in isolation*
- `<aside>`
  - *used to define some content aside from containing parent content*
  - *normally used to help define or relate material to surrounding content*
  - *effectively acts as supporting, contextual material*

HTML5 - Semantic elements and structure

section, article, aside - part 2

- MDN Documentation suggests,

> *if it makes sense to separately syndicate the content of a `<section>` element, use an `<article>` element instead*

and

> *do not use the `<section>` element as a generic container; this is what `<div>` is for, especially when the sectioning is only for styling purposes. A rule of thumb is that a section should logically appear in the outline of a document.*

HTML5 - Semantic elements and structure

figure, figcaption

- `<figure>` & `<figcaption>`
  - *as with print media, we can logically group image and caption*
  - *`<figure>` acts as parent for image grouping*
  - *child elements include*
  - *`<img>` and `<figcaption>`*

```
<figure>
<img src="media/images/philae-demo2.jpg" alt="temple of philae"
width="333px" height="200px">
<figcaption>Ptolemaic temple at Philae, Egypt</figcaption>
</figure>
```

- updated demo with figure grouping - Demo - Semantic structuring

HTML5 - Semantic elements and structure

footer

- `<footer>`
  - *usually contains information about its containing element*
- example 1 - in a footer for an article
  - *might use this element to define and record*
  - *author of the article*
  - *publication date*
  - *suitable tags or metadata*
  - *associated documents...*
- example 2 - a footer simply placed at the **foot** of a page
  - *record copyright information*
  - *contextual links*
  - *contact information*
  - *small logos...*
- example 2 considered standard usage for `<footer>`
  - *continues from HTML4 and earlier generic usage...*

Demos - DOM & HTML

- Demo - DOM Basics - Sample
- Demo - HTML - Internal Anchor
- Demo - Our first web page
- Demo - New elements added
- Demo - Semantic structuring

References

- HTML5 Test
- MDN
  - *HTML developer guide*
  - *Block-level elements*
  - *Content categories*
  - *Inline elements*
- Unicode
  - *The Unicode Consortium*
  - *Unicode Information*
  - *Unicode examples*
- W3C
  - *HTML Attribute Syntax*
  - *HTML5 Documentation*
- W3 Schools
  - *W3Schools - DOM Image*
  - *W3 Schools - HTML Block and Inline Elements*
  - *W3Schools - HTML5 Semantic Elements*