Web development

INTERNET PRESENTATION

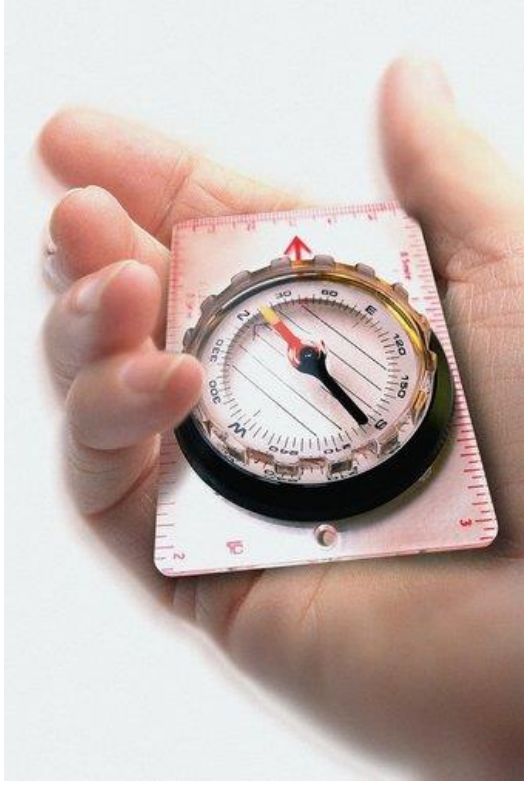
Course objectives

By following this course you will be able to:

- Define what is Internet and its evolutions.
- Define the client / server model.

Web development

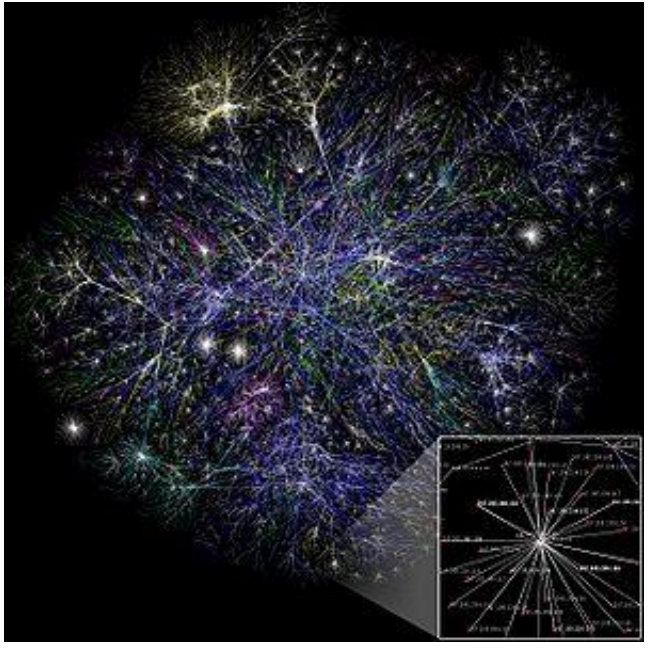
Course plan



- Internet presentation
- Client/Server model

Internet

- Internet is a public worldwide computer network system
- Use the standard Internet Protocol Suite (TCP/IP)
- Network of networks
- Public access to many resources and services

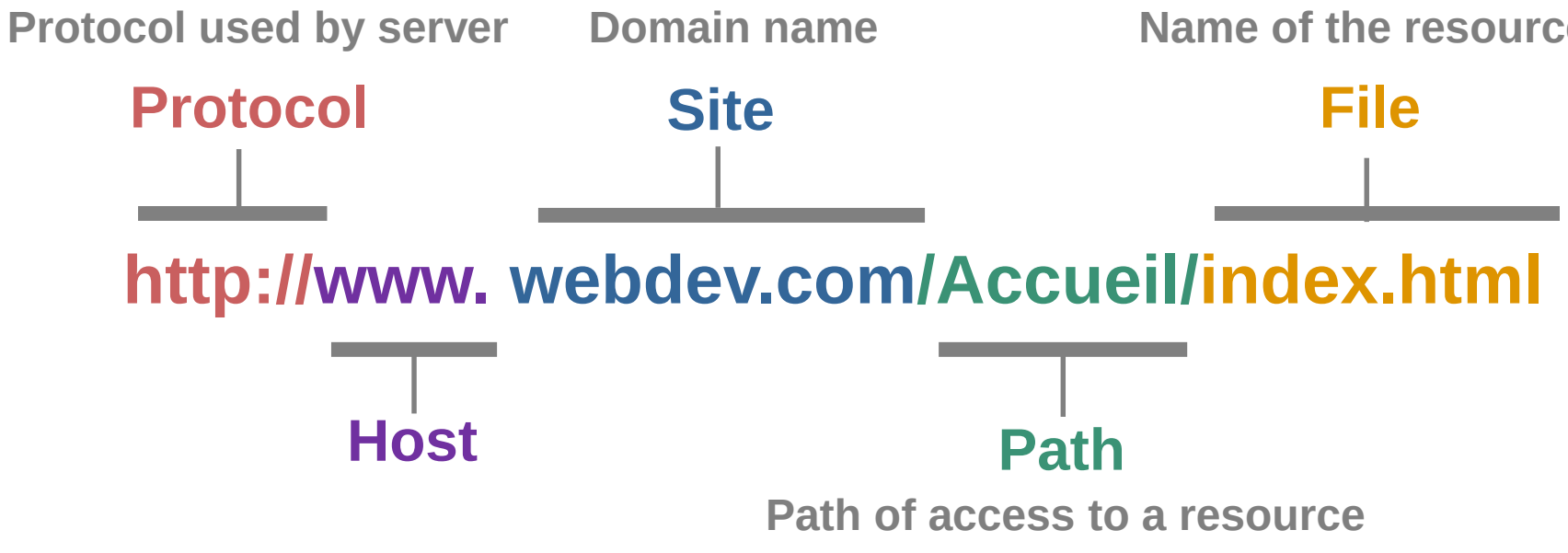


World Wide Web

- Abbreviated as WWW
- Interlinked hypertext documents accessed via the Internet
  - May contain
    - Text
    - Images
    - Videos
    - Etc…

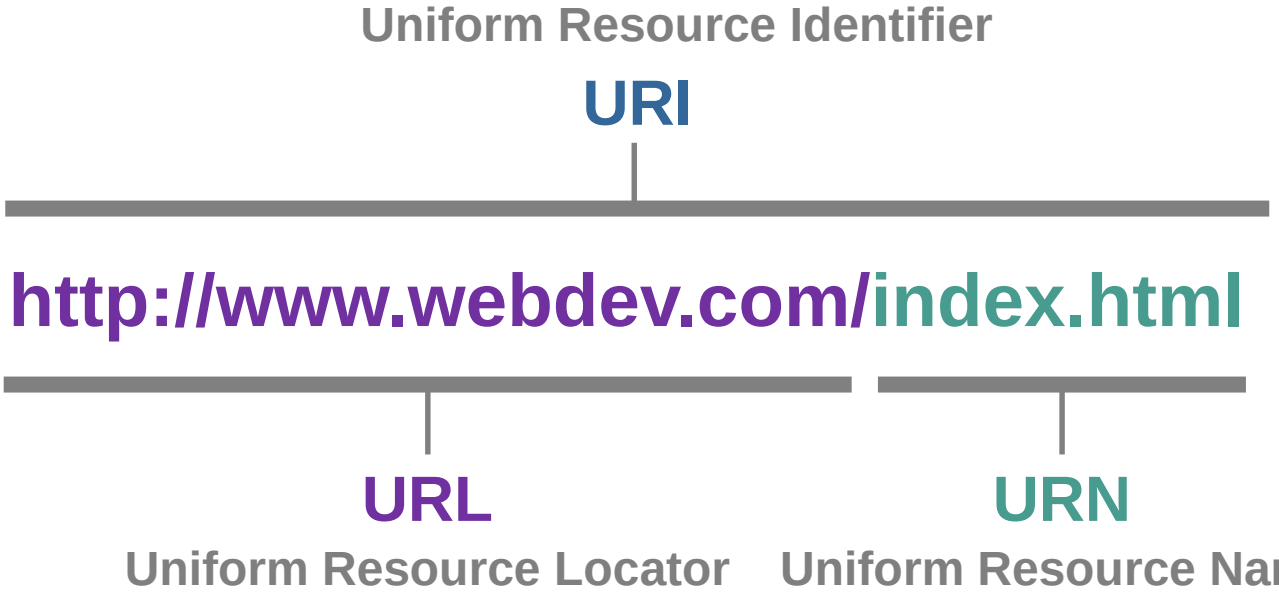
Uniform Resource Identifier

URI : String of characters used to identify a resource on the Internet



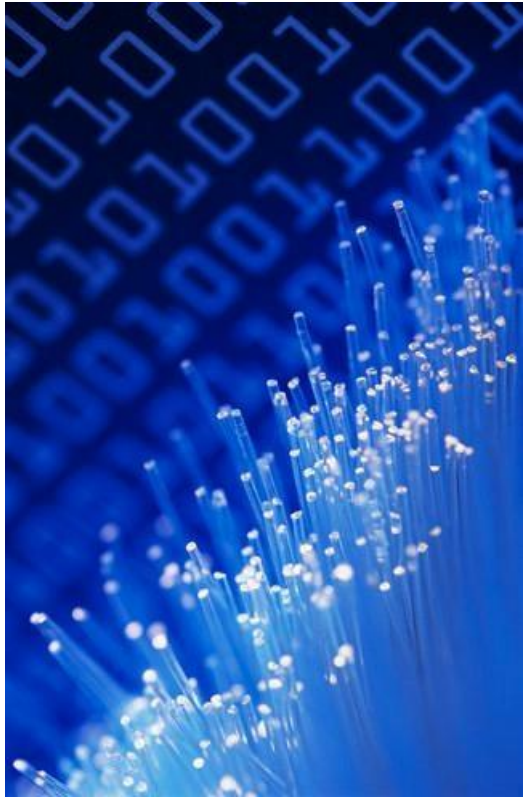
Uniform Resource Identifier

URI = URL + URN



HTML: The Web language

- **H**yper**T**ext **M**arkup **L**anguage
- Used to format a document
- Descriptive language
- Hypertext concept
  - Easy to use
  - Light Format
- Current version : HTML5



Web development

CLIENT - SERVER

The HTTP protocol

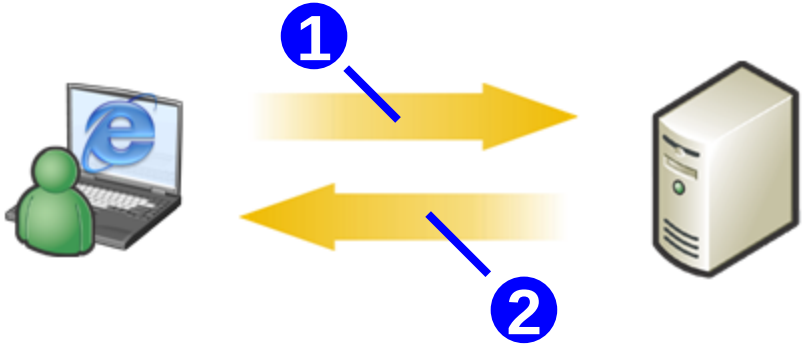
- **H**yper**T**ext **T**ransfer **P**rotocol
- Communications protocol developed for the Web
- Request/Response protocol
  - Client (browser)
  - Server (Web server)
- Data transfer between a browser and a Web server

Other protocols: FTP, POP, SMTP…

The HTTP protocol

1. The client transmits **HTTP requests** to the Web server to reach a resource.

2. The Web server answers at the request of each client by a **HTML page** or other resource.



HTTP request message

- Composed of:
  - A request line composed of:
    - The request method used
    - The resource URI
    - The protocol and the version used
  - Several Headers
  - An empty line
  - An optional message body

HTTP request message

```
POST /en/html/index.html HTTP/1.1
Host: www.website.com
User-Agent: Mozilla/5.0 (Windows;en-GB; rv:1.8.0.11)
Accept:
text/xml,text/html;q=0.9,text/plain;q=0.8,image/png,
*/*;q=0.5
Accept-Language: en-gb,en;q=0.5
Accept-Encoding: gzip,deflate
Accept-Charset: ISO-8859-1,utf-8;q=0.7,*;q=0.7
Keep-Alive: 300
Connection: keep-alive
Content-Type: application/x-www-form-urlencoded
Content-Length: 39
name=MyName&male=yes
```

HTTP request methods

- HTTP defines nine methods (or verbs):
  - **GET**: Request a representation of the resource
  - **POST**: Submit data to be processed to the identified resource
    - Data is included in the request body
  - **HEAD**: Like GET but return response headers only
  - **PUT:** Uploads a representation of the specified resource
  - **DELETE**: Deletes the specified resource
  - …

The Web Server

- Receives HTTP requests and returns HTML pages or others (such as images, sounds, …)

- Three servers dominate the market :
  - Apache HTTP Server (52.3%)
  - NginX (14.4%)
  - Microsoft IIS (11.3%)

Browsers

- Three main browsers:
  - Internet Explorer
  - Mozilla Firefox
  - Google Chrome

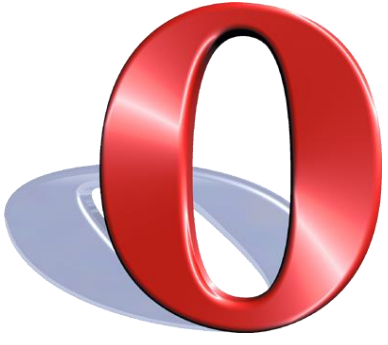
Browsers

- Other browsers…

Epiphany

Safari

Konqueror



Opera

. . .

HTML

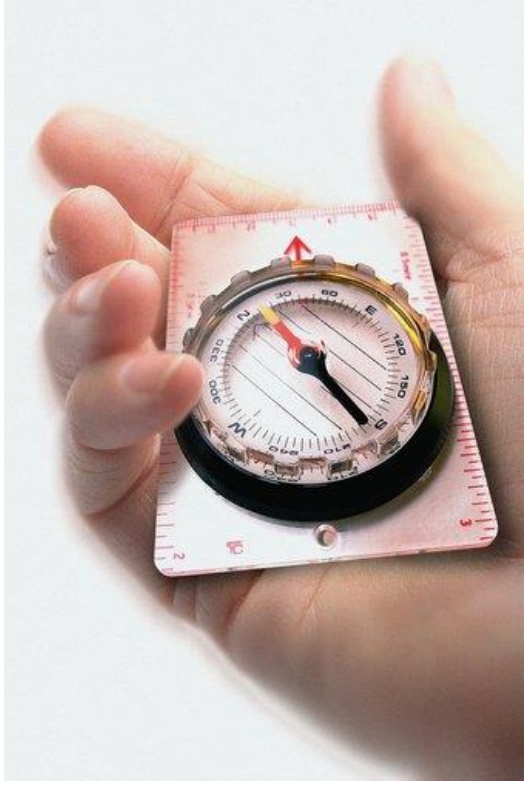
Web development

Objectives

At the end of this course you will be able to:

- Use tools to work with HTML
- Create a page with HTML
- Validate your websites

Course plan



- Introduction
- Basic HTML tags
- What else about HTML?
- Validation

HTML

INTRODUCTION

HTML is everywhere

- HTML is a markup language for structuring and presenting content for the *World Wide Web*
- *Almost* all website you visit use HTML
- Some mobile and desktop apps use HTML

Who drive HTML updates?

- Like many other languages, there are updates:
  - The version 4.0.1 was standardized in 1999
  - HTML5 is recommended since 2014

- Two groups are working on it:
  - WHATWG
  - W3C
- We already saw what is W3C

WHAT Working Group

- **W**eb **H**ypertext **A**pplication **T**echnology **W**orking **G**roup
  - Founded in 2004
  - Community interested in evolving HTML and related technologies
  - Composed by individuals from Apple, the Mozilla Foundation, Opera Software and Google

WHAT Working Group & W3C

- In may 2007, the W3C adopt the WHATWG's HTML5 as the starting point of its work

- Since then, W3C and WHATWG are working together on the development of HTML5

Well that’s great but…

How to write HTML?

Presentation

- An HTML file have the extension .html
- An HTML file is constructed by predefined tag
  - We'll learn the tags step by step

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTM
<html xmlns="http://www.w3.org/1999/xht
<head>
    <title>Make your own Website !</tit
    <meta http-equiv="Content-Type" cor
    <link type="image/x-icon" rel="shor
    <meta name="description" content="W
    <meta name="revisit-after" content=
</head>

<body onload="getId();">
    <div id="body">
        <div id="div_header">
            <div id="quickmenu">
                <div class="element">
                    <a href="#">Accueil
                </div>
```

Presentation

- Tags surrounded by < and >
  - *<tag_name>*
- 2 types of tags:
  - Pairs one:
    - `<p>…</p>`
  - Empty one:
    - `<br />`
- Tags names are always lowercases (good practice)

Tools

- A lot of tools are available !
- To write HTML :
  - Source code editors :
    - Notepad++
    - SublimeText
    - TextMate
  - IDE :
    - Adobe Dreamweaver
    - WebStorm

Tools

- A lot of tools are available !

- To edit, debug, monitor HTML, CSS, and JS live in your modern browser with a built-in inspector:
  - Google Chrome, Opera, Apple Safari
  - Microsoft Edge
  - Mozilla Firefox
  - Vivaldi
  - …

HTML

BASIC HTML TAGS

Step by step…

- We’re going to write a simple web page
  - A simple Resume

- In order to discover some basic HTML tags
- Without CSS for now…

- At the end, you’ll design your own Resume !

Basic HTML tags

Resume example

Page Title

Main Title

Image

Ordered list

Links to anchors

Paragraph

My Resume

http://mywebsite.com/resume.html

John Doe

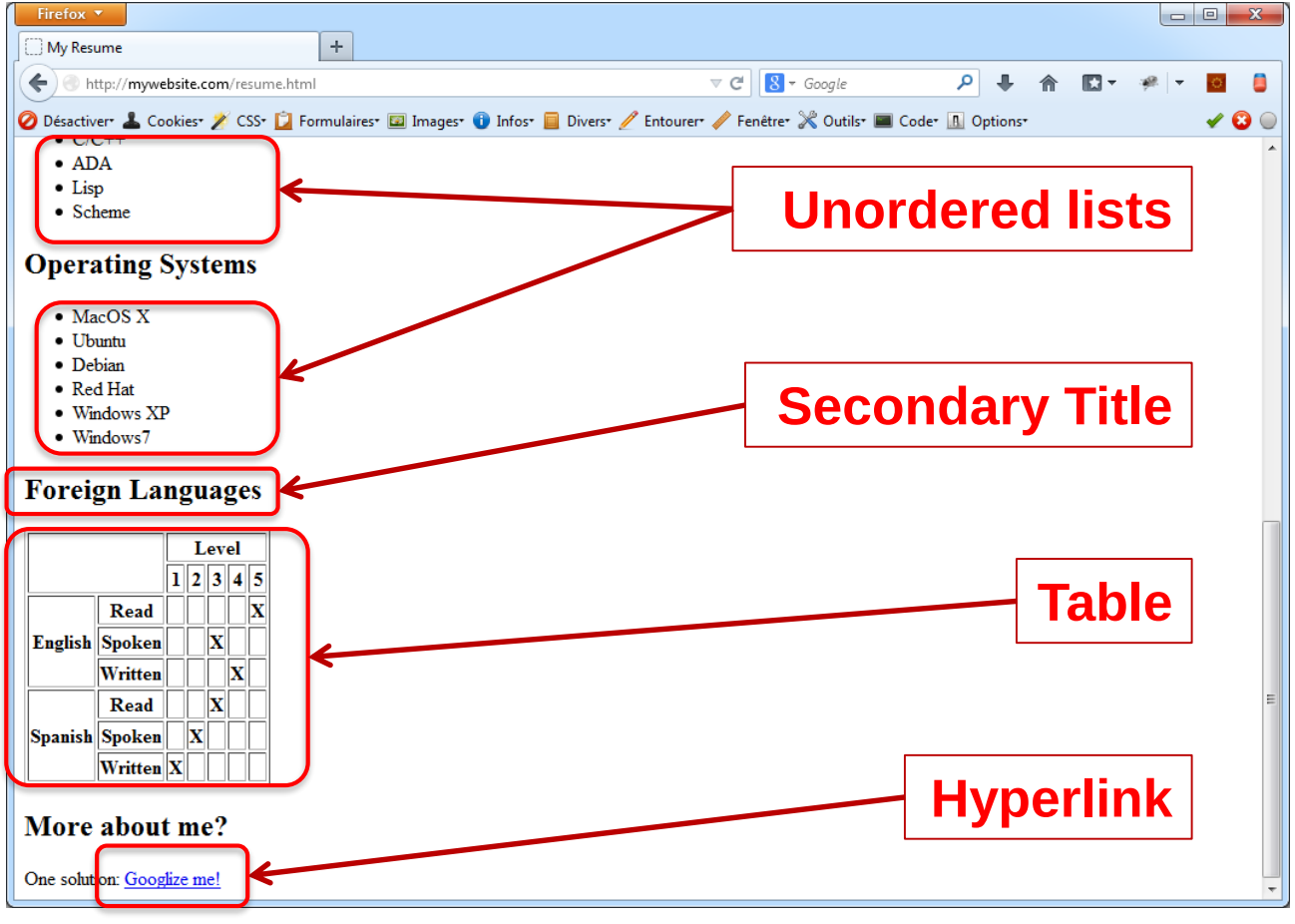
1. Programming Languages
2. Operating Systems
3. Foreign Languages

Lorem ipsum dolor sit amet, consectetur adipiscing elit. In justo est, faucibus et cursus ac, consectetur a tellus. Vestibulum dignissim, augue sit amet adipiscing dapibus, lorem tortor facilisis velit, vel ultrices urna diam nec velit. Fusce sed turpis velit. Duis sit amet lorem mauris. Phasellus congue semper enim quis laoreet. Mauris vulputate urna posuere, rutrum nisl eget, vestibulum ligula. Cras pharetra tincidunt neque id ullamcorper. Donec varius condimentum turpis, sed bibendum turpis commodo eu. Ut diam libero, viverra eu fringilla ac, posuere in enim. Integer congue et nunc at semper. Etiam dui mi, consequat eget lectus a, auctor eleifend libero. Nulla ultricies non eros nec imperdiet.

Programming Languages

- Scala
- C#
- VB
- C/C++
- ADA
- Lisp

Resume example



Before everything: Comments!

- Invisible to Web browsers
- Utilities:
  - Project's resumption after a long time
  - Project's resumption by an other web developer
  - Team working
  - …

```
<!-- This is a comment that can help you in the future -->
```

Basic HTML tags

Step 1: Structure

```
<!DOCTYPE html>
<html>
    <head>

    </head>
    <body>

    </body>
</html>
```

Step 1: Structure

```
<!DOCTYPE html>
```

- Declares to the browser that you're writing HTML
- A Doctype should be placed before the root element

Step 1: Structure

```
<html>
...
</html>
```

- *Block* type tag
- Root of the document
- Contains <head> and <body> tags

Step 1: Structure

```
<head>
...
</head>
```

- *Block* type tag containing headers:
  - `<title>`
    - Page's title (for example, it's the name of the window browser)
  - `<style>` and `<link />`
    - Include styles (CSS, see later)

Step 1: Structure

```
<head>
...
</head>
```

- *Block* type tag containing headers:
  - `<script>`
    - Include JavaScript
  - `<meta />`
    - Help for referencing

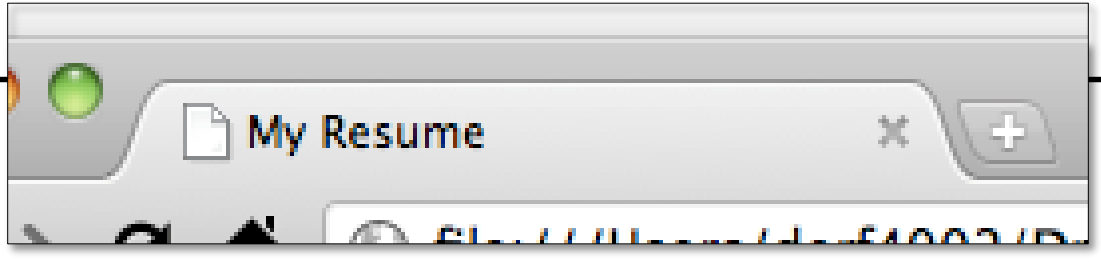
Step 1: Structure

```
<body>
. . .
</body>
```

- *Block* type tag containing body:
  - Contains all the element which describe the content of the document
    - Paragraphs
    - Images
    - Etc…

Step 2: Page title

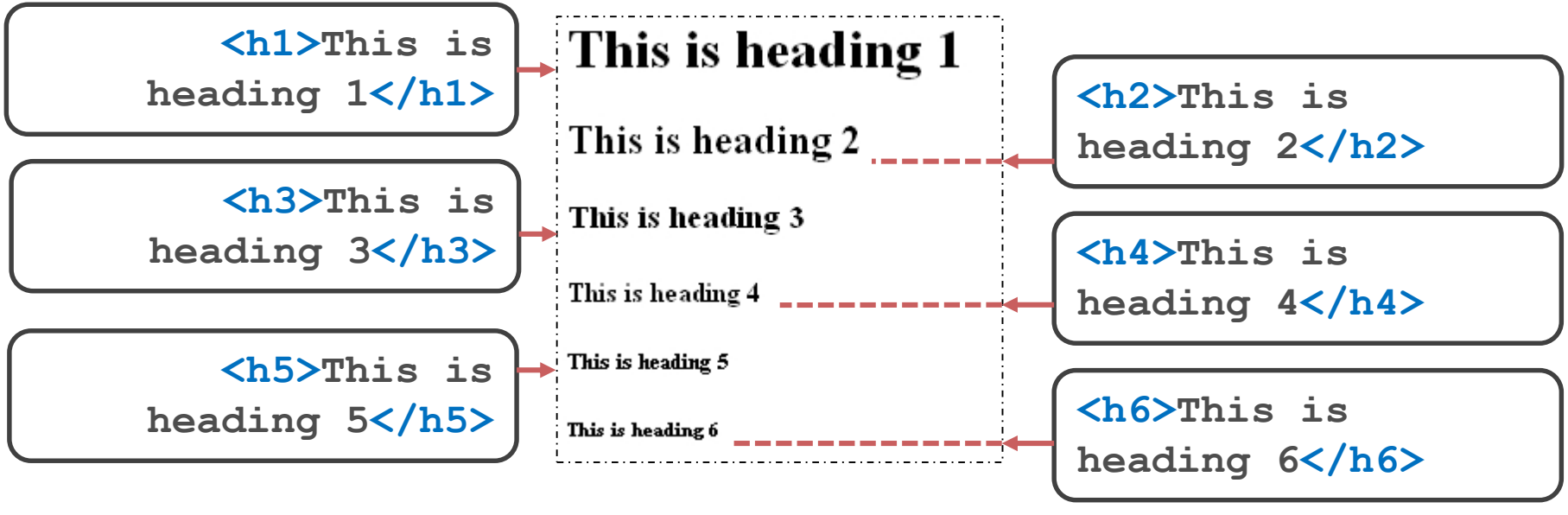
```
<!DOCTYPE html>
<html>
    <head>
        <title>My resume</title>
    </head>
    <body>

    </body>
</html>
```



Step 3: Titles

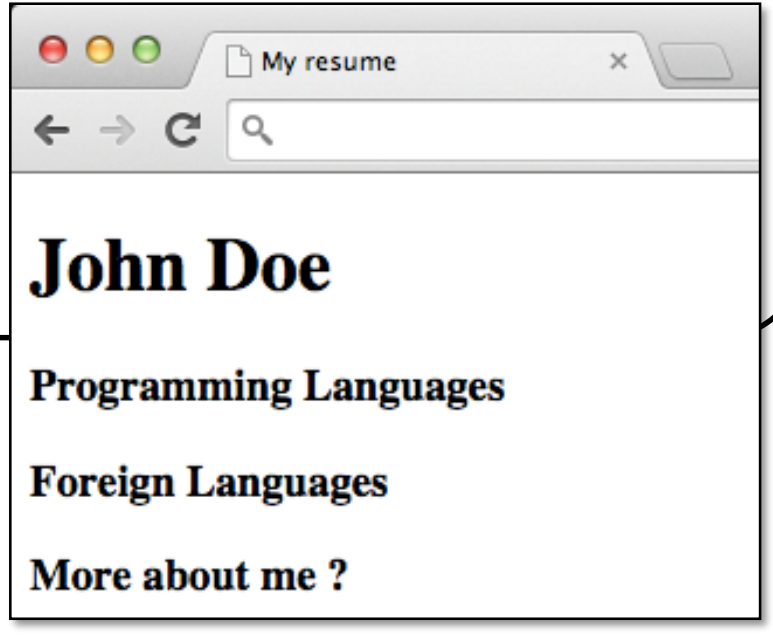
`<h`***n***`>...</h`***n***`>`

- Six tags defining titles:



Step 3: Titles

```
...
<body>
    <h1>John Doe</h1>
    <h3>Programming Languages</h3>
    <h3>Foreign Languages</h3>
    <h3>More about me ?</h3>
</body>
...
```



Step 4: Paragraphs

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

- Defines a paragraph
- Automatically adds a new line

`<br />`

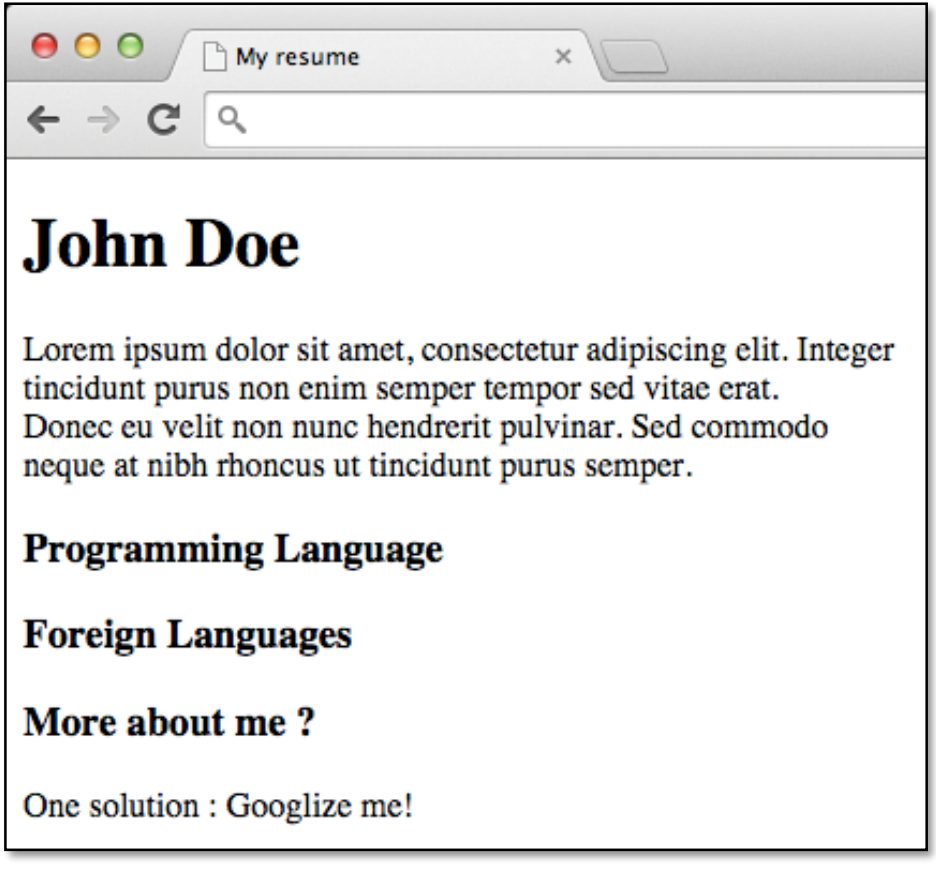
- Used to break a line
- *Empty* tag

```
...
<body>
    <p>First Paragraph</p>
    <p>Second <br/> Paragraph</p>
</body>
...
```

Paragraphs

```
<body>
    <h1>John Doe</h1>
    <p>
        Lorem ipsum dolor sit amet, consectetur
        adipiscing elit. Integer tincidunt purus non
        enim semper tempor sed vitae erat. <br/>

        Donec eu velit non nunc hendrerit pulvinar.
        Sed commodo neque at nibh rhoncus ut
        tincidunt purus semper.
    </p>
    <h3>Programming Languages</h3>
    ...

    <h3>More about me?</h3>
    <p>
        One solution : Googlize me!
    </p>
</body>
```

Step 4: Paragraphs



Step 5: Lists

`<ol>...</ol>`

- Defines an Ordered list
- Each element is defined by: `<li></li>`

```
<ol>
    <li>HTML</li>
    <li>Javascript</li>
</ol>
```

1. HTML
2. Javascript

Step 5: Lists

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

- Defines an Unordered list
- Each element is defined by: `<li></li>`

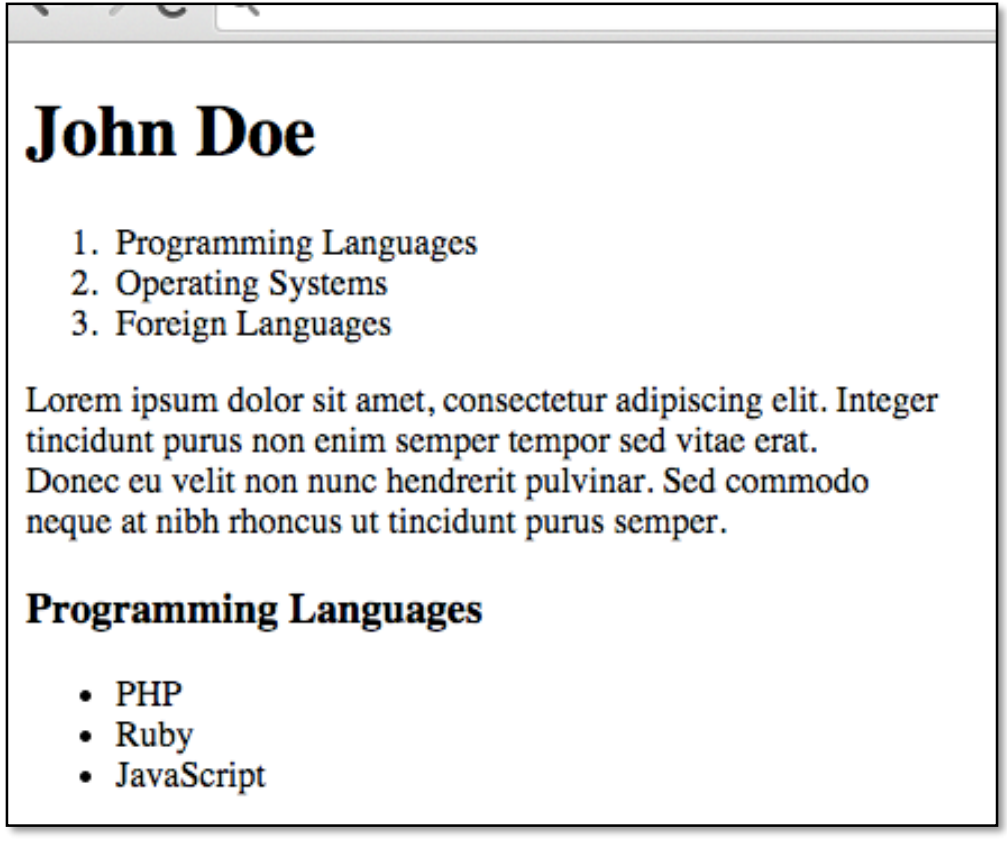
```
<ul>
    <li>HTML</li>
    <li>Javascript</li>
</ul>
```

- HTML
- Javascript

Lists

```
...
<body>
    <h1>John Doe</h1>
    <ol>
        <li>Programming Languages</li>
        <li>Operating Systems</li>
        <li>Foreign Languages</li>
    </ol>

    ...
    <h3>Programming Languages</h3>
    <ul>
        <li>PHP</li>
        <li>Ruby</li>
        <li>JavaScript</li>
    </ul>
</body>
...
```

Step 5: Lists


John Doe
1. Programming Languages
2. Operating Systems
3. Foreign Languages
Lorem ipsum dolor sit amet, consectetur adipiscing elit. Integer tincidunt purus non enim semper tempor sed vitae erat. Donec eu velit non nunc hendrerit pulvinar. Sed commodo neque at nibh rhoncus ut tincidunt purus semper.
Programming Languages
• PHP
• Ruby
• JavaScript

Step 6: Links and anchors

`<a>...</a>`

- Used to create:
  - A link to another resource
  - Might be:
    - A file to download
    - An element in the same page
    - Another page
    - …

Step 6: Links and anchors

- Three types:
  - Relative links

```
<a href="file.html">My link</a>
```

  - Absolute links

```
<a href="www.website.com/file.html">My link</a>
```

Step 6: Links and anchors

- Three types:
  - Link to anchor:
    - Direct jump to a specific section of a document

```
<span id="myAnchor">My text</span>
```

```
<a href="file.html#myAnchor">My link</a>
```

Links and anchors

```
...
<h1>John Doe</h1>
<ol>
    <li><a href="#Dev">Programming Languages</a></li>
    <li><a href="#OS">Operating Systems</a></li>
    <li><a href="#Foreign">Foreign Languages</a></li>
</ol>

...

<h3 id="Dev">Programming Languages</h3>
...

<h3 id="OS">Operating Systems</h3>
...

<h3 id="Foreign">Foreign Languages</a></h3>
...
```

Links and anchors

```
...

<h3>More about me?</h3>

<p>
    One solution:
    <a href="http://www.google.fr/#q=%22John+Doe%22">
        Googlize me!
    </a>
</p>

...
```

Step 6: Links and anchors

1. Programming Languages
2. Operating Systems
3. Foreign Languages

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Integer tincidunt purus non enim semper tempor sed vitae erat. Donec eu velit non nunc hendrerit pulvinar. Sed commodo neque at nibh rhoncus ut tincidunt purus semper.

Programming Languages

- PHP
- Ruby
- JavaScript

Foreign Languages

More about me ?

One solution : Googlize me!

Step 7: Pictures

- Used to display a picture, *empty* tag
- Two attributes required:
  - src="url"
  - alt="alternative text"
- Title: tool tip

Step 7: Pictures

- Example:

```
<img src="picture.jpg" alt="A picture" title="My picture" />
```

- Rules about attributes:
  - Must be written in the start tag
  - Attribute names in lowercase

Pictures

```
...

<h1>John Doe</h1>

<img src="image.png" alt="A picture" title="My
picture" />

<ol>
    <li><a href="#Dev">Programming Languages</a></li>
    <li><a href="#OS">Operating Systems</a></li>
    <li><a href="#Foreign">Foreign Languages</a></li>
</ol>

...
```

Step 7: Pictures

Step 8: Tables

`<table>...</table>`

- Divided into rows (Table Rows): `<tr>...</tr>`

- Each row may contains:
  - Headers (Table Header): `<th>...</th>`
  - Datas (Table Data): `<td>...</td>`

- Tags **td** and **th** makes cells!

Step 8: Tables

```
<table>...</table>
```

- Usages:
  - Classification of data
  - Display in tabular format

- Bad usage:
  - Layout!

Tables - Example

```
<table border="1">
    <tr>
        <th>Line 1, Header 1</th>
        <th>Line 1, Header 2</th>
    </tr>
    <tr>
        <td>Line 2, Cell 1</td>
        <td>Line 2, Cell 2</td>
    </tr>
    <tr>
        <td>Line 3, Cell 1</td>
        <td>Line 3, Cell 2</td>
    </tr>
</table>
```

Line 1, Header 1	Line 1, Header 2
Line 2, Cell 1	Line 2, Cell 2
Line 3, Cell 1	Line 3, Cell 2

Step 8: Tables

- Merging cells

- Two attributes:
  - colspan: width in number of cells
  - rowspan: height in number of cells

- Of course you can use both colspan and rowspan on the same cell

Tables – Merge example

```
<table border="1">
    <tr>
        <th colspan="2">Header</th>
    </tr>
    <tr>
        <td>1</td>
        <td rowspan="2">Merging two lines</td>
    </tr>
    <tr>
        <td>2</td>
    </tr>
    <tr>
        <td colspan="2">
            Fusionning two cells
        </td>
    </tr>
</table>
```

Header	
1	Fusionning 2 lines
2	
Fusionning 2 cells	

Tables

```
...

<h3><a name="Foreign">Foreign Languages</a></h3>

<table>
    <tr>
        <th colspan="2" rowspan="2"></th>
        <th colspan="5">Level</th>
    </tr>
    <tr>
        <th>1</th>
        <th>2</th>
        <th>3</th>
        <th>4</th>
        <th>5</th>
    </tr>

...
```

Tables

```
...

<tr>
    <th rowspan="3">English</th>
    <th>Read</th>
    <td></td><td></td><td></td><td></td><td></td><td>X</td>
</tr>
<tr>
    <th>Spoken</th>
    <td></td><td></td><td></td><td>X</td><td></td><td></td><td></td>
</tr>
<tr>
    <th>Written</th>
    <td></td><td></td><td></td><td></td><td></td><td>X</td><td></td><td></td>
</tr>
</table>

...
```

Step 8: Tables

Operating Systems

- Mac OS X
- Windows XP / 7 / 8
- Ubuntu
- Gentoo

Foreign Languages

		Level				
		1	2	3	4	5
English	Read					X
	Spoken			X		
	Written				X	

More about me ?

One solution : Googlize me!

HTML

WHAT ELSE ?

What else?

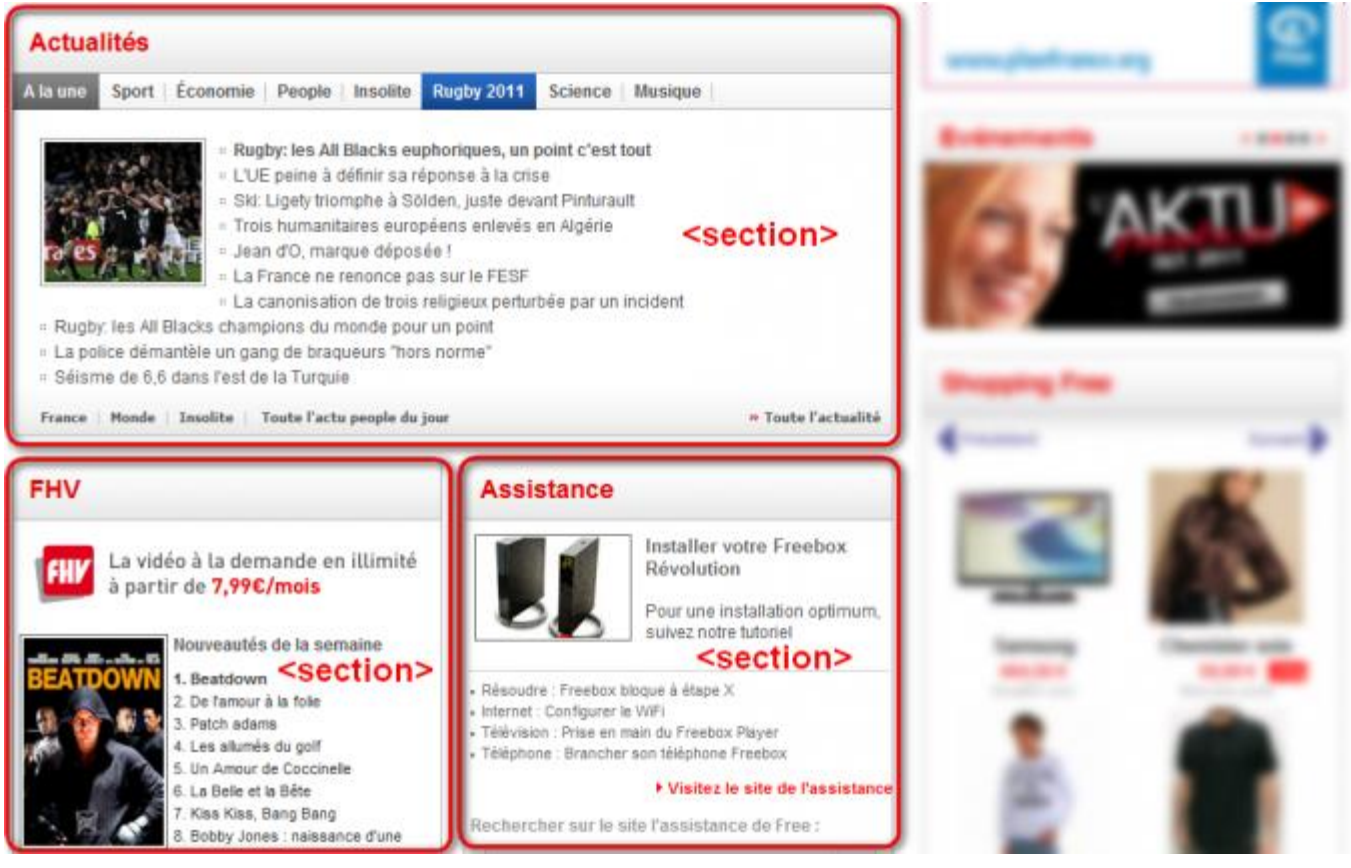
Section

- The **section** element represents a generic section of a document
  - A chapter for example

```
<section>
   <h1>Chapter 2 : Basic HTML tags</h1>
   <p>
       HTML markup consists of several key components,
       including elements […], character-based data types,
       character references and entity references
   </p>
</section>
```

What else?

Section



What else?

Article

- The article element represents a self-contained composition independently distributable or reusable

  - News
  - Blog posts
  - …

```
<article id="comment-6">
   <header>
       <h4>John Doe</h4>
   </header>
   <p>Very good course ;-)</p>
</article>
```

What else?

Article

Trente ans après, « Super Mario Bros. » casse toujours des briques

Le jeu vidéo le plus emblématique des années 1980 continue d'alimenter activement la culture populaire, grâce à son univers iconique et son inépuisable richesse.

Abonnez-vous à partir de 1 € Réagir Classer Partager

Recommander Partager 27 personnes recommandent ça. Soyez le premier parmi vos amis.

Le Monde.fr | 12.09.2015 à 20h35 • Mis à jour le 13.09.2015 à 10h19 | Par William Audureau

Au diable les lois de la physique et de la biologie. Pour quiconque a déjà tenu une manette en main, la vérité ne fait aucun doute : les tortues les plus agressives sont rouges et ailées ; manger des fleurs permet de jeter des boules de feu ; des haricots magiques et des sous se cachent dans les briques ; et, par définition, les princesses sont toujours dans un autre château.

Ce dimanche 13 septembre, *Super Mario Bros.* et son univers loufoque fêtent leurs trente ans, et rares sont les jeux vidéo à pouvoir se vanter d'avoir traversé les générations tout en restant aussi iconiques, aussi modernes, aussi proches.

Un vivier à hommages

EN CONTINU 08:34 La canonisation du prêtre polonais Jerzy Popieluszko en route pour Rome

<article>

What else?

Nav

- The **nav** element represents a section of navigation links

```
<nav>
   <h1>Navigation</h1>
   <ul>
       <li><a href="/">Home</a></li>
       <li><a href="/about.html">About</a></li>
   </ul>
</nav>
```

What else?

Header

- The **header** element represents the header of a section

```
<header>
   <h1>Introduction to HTML5</h1>
   <p class="author-line">By John Doe</p>
</header>
```

What else?

Footer

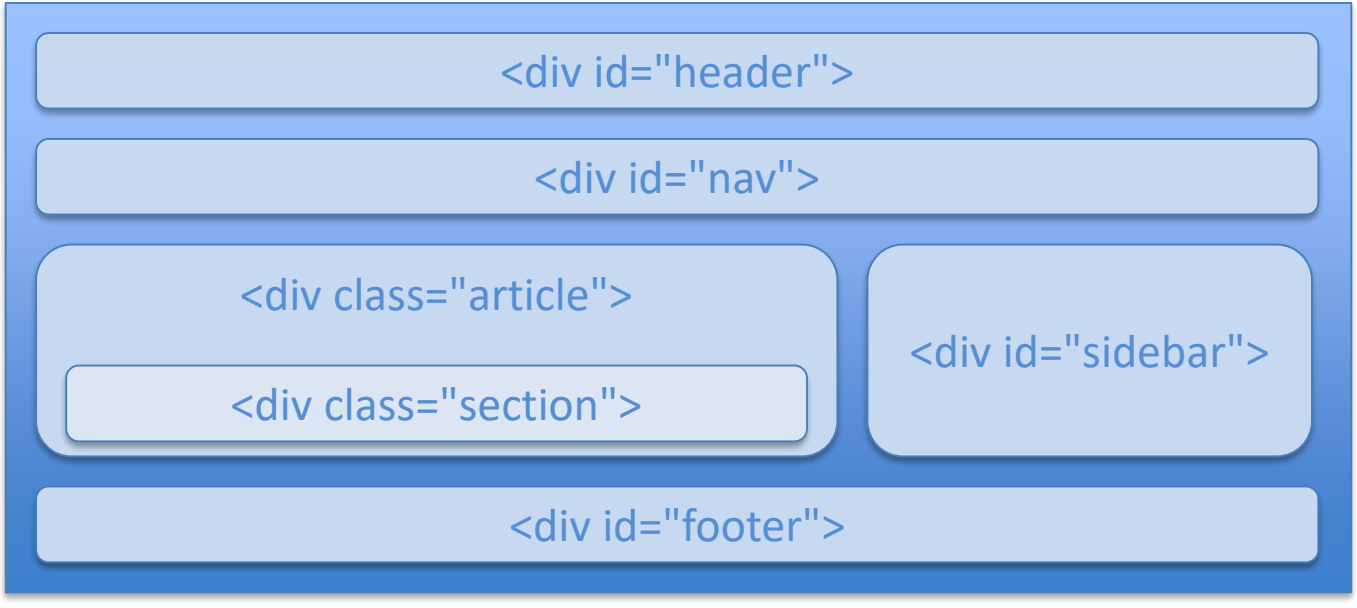
- The **footer** element represents a footer for its nearest ancestor sectioning content

```
<footer>
   <p>© 2015 SUPINFO International University</p>
</footer>
```

What else?

Old semantic

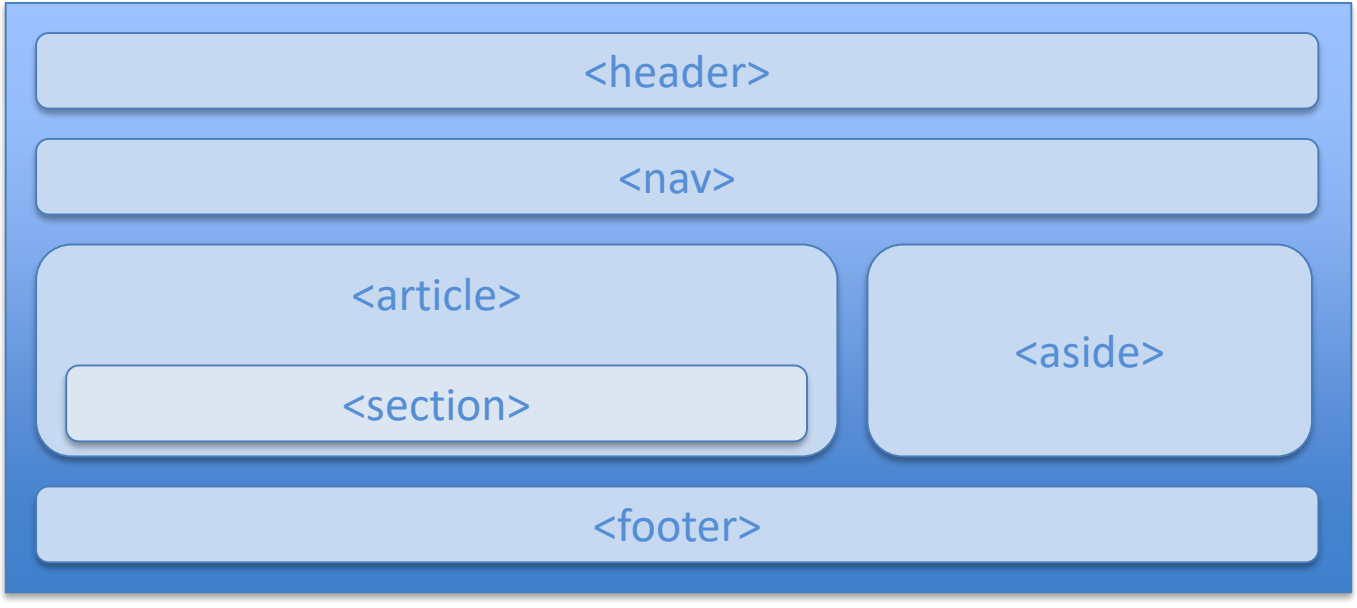
- Most websites had some common uses of generic blocks:



What else?

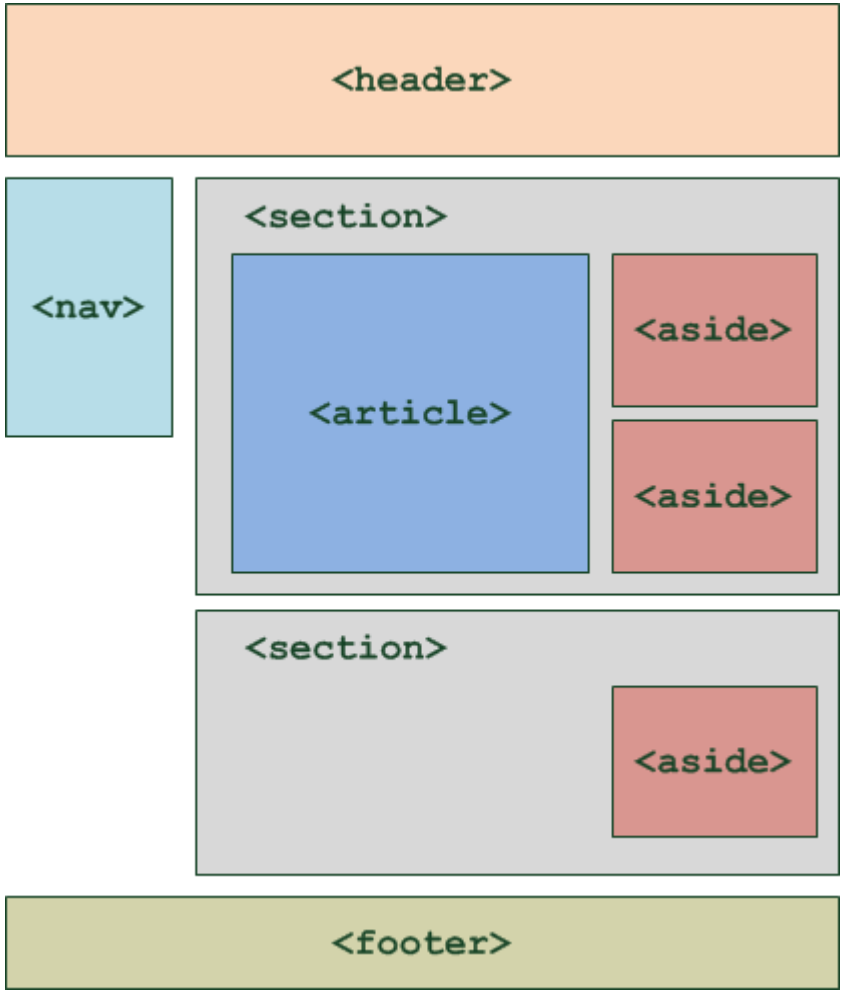
Good semantic

- HTML5 introduced the following new markups:



What else?

Good semantic



Semantic Example

```
<body>
    <header><!-- Header content --></header>
    <article>
        <section>
            <!-- Section content -->
        </section>
        <section>
            <!-- Other section content -->
        </section>
    </article>
    <aside>
        <!-- Aside content -->
    </aside>
    <footer><!-- Footer content --></footer>
</body>
```

What else ?

Special characters

- Main case:
  - & <HTML Code or ”#” + unicode> ;

- Example:

```
<p> Web'n'Dev &#169; </p>
```

Web'n'Dev ©

What else ?

Specials characters

- Spaces are trimmed in HTML
  - Many spaces will be merged into one

```
<p> Web'n'Dev      rocks</p>
```

Web'n'Dev rocks

- You can use   (Non Breakable SPace)

```
<p> Web'n'Dev   rocks</p>
```

Web'n'Dev rocks

What else ?

Specials characters

- Special case for the accents

Rule: « & » + used letter + abbrevation + « ; »

Description	Abbreviation
Grave accent	grave
Acute accent	acute
Circumflex accent	circ
Cedilla	cedil
Umlaut mark	uml
Tilde	tilde

What else ?

Specials characters

- Examples:

Code	Display
è	è
é	é
â	â
ç	ç
ü	ü
˜	~

What else ?

Balise Block and Inline

- **block** : une balise de type block crée automatiquement un retour à la ligne avant et après.
- **inline** : une balise de type inline se trouve obligatoirement à l'intérieur d'une balise block. Une balise inline ne crée pas de retour à la ligne, le texte qui se trouve à l'intérieur s'écrit donc à la suite du texte précédent, sur la même ligne (c'est pour cela que l'on parle de balise « en ligne »).

What else ?

Balise Block and Inline

Balises block	Balises inline
<p>	
<footer>	
<h1>	<mark>
<h2>	<a>
<article>	<img />
…	…

HTML

VALIDATION

Why validate?

- Validate is essential for normalization:
  - Universal accessibility
  - Portability
  - Speed production
  - Easily controls
  - Documents durability
  - Referencing
  - …

Validate!

http://validator.w3.org/

- Possibility to validate by:
  - URI, file upload, copy of source code
- Limit:
  - Validation for only one page

Advice: if you have several errors, always correct the first one, and revalidate your document.

Exercices

- Now it’s your turn!
- Create your own Resume
  - With a complete civil status
  - A picture representing you
  - A quick description of yourself
  - Your education
  - All your competences
  - Your professional experiences
  - Your hobbies