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Advanced Web Programming

HTML 5.0

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ESNL	MI	B3	ISSE

Introduction

- **HTML (*HyperText Markup Language*)**: (tag-based language for hypertext)

  - A language for describing web documents, used to structure the content within these documents.
  - Tag-based: The structure of documents is organized using tags.
  - For hypertext: Documents contain hyperlinks enabling direct access to other parts of the document.
  - Language for formatting hypertext documents (text + links to other documents).

Introduction

- **A tag-based language:**

vocabulary + syntax + semantics

  - Syntax = grammar
  - Semantics = meaning

- The **vocabulary** allows for constructing texts that adhere to the **syntax** and have **meaning**.

Introduction: Vocabulary

- Predifined elements, identified by tags:
  - Opening/Closing: <element> / </element>
  - <h1>   / </h1> ...
  - The content of an element is the code between Opening tag and Closing tag:

     p element content

Introduction: Syntax

- **Document structure:**

```
<!DOCTYPE html>
<html >
<!-- entête du document -->
    <head>
    <title>Document HTML 5 minimal</title>
     <meta charset="UTF-8"/>
     </head>
<!-- corps du document -->
      <body>
      <!-- place the content of the page here-->
      ...
      </body>
</html>
```

Introduction: Syntax

- **Structure of the Document:**

Valid HTML document must contain at least:

  - Type indication <!DOCTYPE html> in the begining of the file.
  - <html> tag which is the root (it contains all the other tags).
  - <!DOCTYPE html>: type indication in the beginning.
  - <html> tag which is the root (it encloses all theother tags).
  - html tag contains two child tags: <head> and <body>

Introduction: Syntax

- **Document structure**

  - <head> tag represents the head of the document.
    It may contain diverse information (steelsheets, title, caracters encoding,....).

  - Mandatory tag in the head: **title**.

  - It is often obligatory to add a tag
    <meta charset="utf-8" /> in the head tag (declaration of the encoding caracter used).

  - Body tag represents the page content. We find diverse tags (div, p, table, …) which format the page content.

Writing rules

- **Parenthesis:**

1. Valid html document is **well parenthesized**.

2. For each opening tag **<element>** must be associated a closing tag **</element>**.

Elements should not overlap:

first opened, last closed.

Introduction

- **Validation:**
  - An **HTML** document is valid if it respects all these rules.
  - **Validation** tools enables **checking** and correction of syntax in the document.

http://validator.w3.org/

Introduction

- **Semantics:**

  - Each element (tag) is associated with a **semantic** that defines ots usage.
  - It helps to understand when and why an element is used.
  - <p> : represent a paragraph.
  - <time> : used to identify a time or date.
  - <td> : represents a ‘cell’ in a table.
  - : is used to give importance to a text.
  - etc.

Main HTML Tags

- **Heading Levels:**
  - There are diffrent heading levels from 1 to 6, each has its own significance. The the tag representing these heading levels is **<hX>**, where X represents the level.

Example of title:

<h1>Title of my page</h1>

Main HTML Tags

- **Text paragraphs:**
  - Like any text document, an HTML document needs to be segmented into paragraphs.
  - This segmentation is possible by specifying where each paragraph begins and ends.
  - This is the role of the tag.

    Text paragraphs in HTML

     First paragraph.

     Second paragraph.

Main HTML Tags

- text or text: italicize text.
- text ou text : Display text in bold.
- **Incresing text size**: <big>text</big>
- **Decreasing text size**: <small>text</small>

Main HTML Tags

- **Text color modification:**

  – ‘**color**’ attribut of **** tag is used:

   Text will be in red.

- **Colors can be written in two ways:**

  – In RGB hexadecimal format preceded by (#) ; Exemples: #ff0000 => red, #00ff00 => green, #0000ff => blue.

  – Textually in US English; examples: red, yellow, pink.

Main HTML Tags

- **Modify text font:**

  To modify the text font, the face attribute of the tag is used:

  Text in Verdana:

   This text will be in Verdana.

- It is common to specify font families rather than a single font. This is because on a system different from ours, thechosen font might not be installed. Different fonts are separated by commas.

  Text in Verdana or sans-serif

  This text will be in verdana or in sans-serif if verdana is not installed.

Main HTML Tags

- **Changing text size:**

  To modiy the text size, the ‘size’ attribut of the <font> tag is used.

- **Example:**

```
<font size="5">This text will be in size 5. </font>
```

By default, the value of the size attribute is ‘3’.
Possible values are integers from ‘1’ ‘7’.

Main HTML Tags

Images:

- To display an image in HTML, the « <img> » tag is used. It has various attributes, among which the most important are ‘src’ and ‘alt’.
- The ‘src’ attributes apecifies the path of the image.
- The ‘alt’ attribute displays alternative text in place of the image if it cannot be loaded.

Display an image

<img src="adress/of/the image" alt="Image Description">

- The different image formats supported by this tag are

GIF , JPG et PNG

Main HTML Tags

- **Audio in HTML 5:**

  - **audio** and **img** elements: used to add audio or image to web page, we use the **audio** element.

  - The **audio** element requires ‘src’ attribute to function..

  - Most supported formats are **mp3** and **ogg**.

  - However, if you only write this, you won’t see anything on the screen. By default, the audio element is not displayed on web pages.

Main HTML Tags

- The **controls** attributes is used to display control buttons like play, pause, and volume. This attribute is mandatory.

- The '**autoplay**' attribute let us automaticakllystart playing the audio file when the page loads. The **loop** attribute allows us to repeat the music in a loop.

- **Width:** Attribute used for modfying the default **audio** element's bar width.

- Lastly, the **preload** attribute helps conserve bandwidth and enhance site performance.

- There are no format supported by all browsers. This means we need to specify multiple formats when inserting audio in HTML.

Main HTML Tags

- **Video in HTML 5:**
  - To add a video, the **video** element is used.
  - The attrbutes taken by this element are exactly the same as thosetaken by the audio element, namely:**src, autoplay, controls, loop, preload, and width.**
  - It is also possible to add a **poster** attribute to the video. The **poster** attribute allows downloading and displaying an image that will be shown before the video starts.

Main HTML Tags

- **Hyperlinks:**

  - A hyperlink is an HTML element that allows drecting the visitor to a new page.
  - A link is represented in code by the <a> tag.
  - The destination adress should be placed within the '**href**' attribute.

- **Examlpe of a text link:**

```
<a href="destination/of/the/adress/html"> Text link </a>
```

- **Example of an image link:**

```
<a href="adress/of/destination.html">
<img src="adress/of/image.gif"></a>
```

Links

- **External links:**

  - An external link isa hyperlink thatpoints to another page.
  - This page can be a page within the same site or on another site.

- **Internal links:**

  - An internal link is a link that redirects to a specific place within the same page.
  - Anchors allow navigation within the same page.
  - To create an anchor, use (#) followed by a keyword. This keyword will be used in the **‘id’** attribute of the tag to which the anchor referes.

Links

- **Example of internal anchor**

```
<a href="#motClef">Text of my anchor </a>
<h2 id="motClef">Text to which the anchor refers </h2>
```

Or

```
<a name="keyword">Text to which the anchor refers </a>
```

- **Examlpe of external anchor**

```
<a href="adress/of/destination.html#keyword">Text of my anchor </a>
```

Lists

1. **Unordered lists**
   - Introduced by <ul> tag and each of the items is surrounded by the <li> tag.

Examlpe of unordered list:

```
<p>My list :</p>
<ul>
<li>element1</li>
<li>element2</li>
</ul>
```

2. Ordered lists:

- Introduced by **<ol>** tag and each of the items is surrounded by the **<li>** tag.

- There are five different ways to number ordered lists .We choose the numbering type using the type attribute <ol>.

- Types are:
  1: Numbering with Aeabic numerals(default).
  I: Numbering with uppercaseRoman numerals.
  i: Numbering with lowerecase Roman numerals.
  A: Numbering with uppercase alphabetical letters.
  a: Numbering with lowerecase alphabetical letters.

Main HTML Tags

- It is possible to modify the starting number from which the numbering will increment. For this purpose.

- Specify **start** attribute value of the **<ol>** tag.

<ol type="1" start="8">

- **Creating a simple table:**
  - Table in HTML are used to organize data.
  - To create a table, we need to use at least three elements: **table, tr,** and **td**.
  - The **table** element defines: Table.
  - **tr** element (table row): Add rows.
  - Every HTML table is constructed line by line.
  - The **td** (table data) element is used to add celle within our rows.

Main HTML Tags

```
<!DOCTYPE html>
<html>
<head>
  <meta charset="utf-8"/>
  <title>Les tableaux</title>
</head>
<body>
  <table>
    <tr>
      <td>Nom</td>
      <td>Prénom</td>
      <td>Age</td>
    </tr>
    <tr>
      <td>Giraud</td>
      <td>Pierre</td>
      <td>24 ans</td>
    </tr>
  </table>
</body>
</html>
```

Nom	Prénom	Age
Giraud	Pierre	24 ans

Main HTML Tags

- Typically, tables have a header row. To create this row, we use **th** ttable head) element.

- If we want to create a header row fo columns, we replace the first **td** element in each **tr** element with **th** elements.

```
<table>
  <tr>
    <th>Nom</th>
    <th>Prénom</th>
    <th>Age</th>
  </tr>
  <tr>
    <td>Giraud</td>
    <td>Pierre</td>
    <td>24 ans</td>
  </tr>
</table>
```

Main HTML Tags

- **Building a structured table:**
  - When creating a lenghthly table, it's benefical to organize it by dividing it into several sections.
  - A table canbe divided into three sections: a header section (**header**), a table body (**body**), and a footer (**footer**). These three parts are represented in HTML by the elements **thead, tbody,** and **tfoot**.
  - The **thead** element will contain the header row.
  - The **tfoot** element will include summarized data from the table, such a totals, for instance.
  - The **tbody** element will contain table data.

Main HTML Tags: Combining cells

- The HTML attribute **colspan** and **rowspan** are used to combine cells.
- The **colspan** attribute allows to combine cells belonging to different columns into a single column.
- To combine cells from different rows, the **rowspan** attribute can be used.

Main HTML Tags

```
<!DOCTYPE html>
<html>
<head>
   <meta charset="utf-8"/>
   <title>Les tableaux</title>
</head>
<body>
   <table>
      <tr>
         <th>Nom</th>
         <th>Prénom</th>
         <th>Age</th>
      </tr>
      <tr>
         <td>Giraud</td>
         <td>Pierre</td>
         <td rowspan="2">24
ans</td>
      </tr>
      <tr>
         <td colspan="2">Dupont
Martin</td>
      </tr>
   </table>
</body>
</html>
```

Nom	Prénom	Age
Giraud	Pierre	24 ans
Dupont Martin		

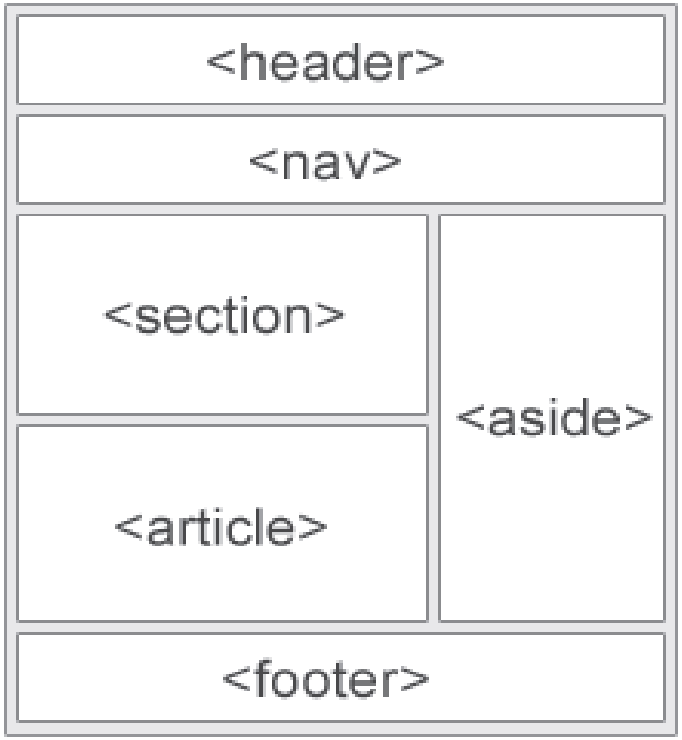
Structural Tags of HTML5

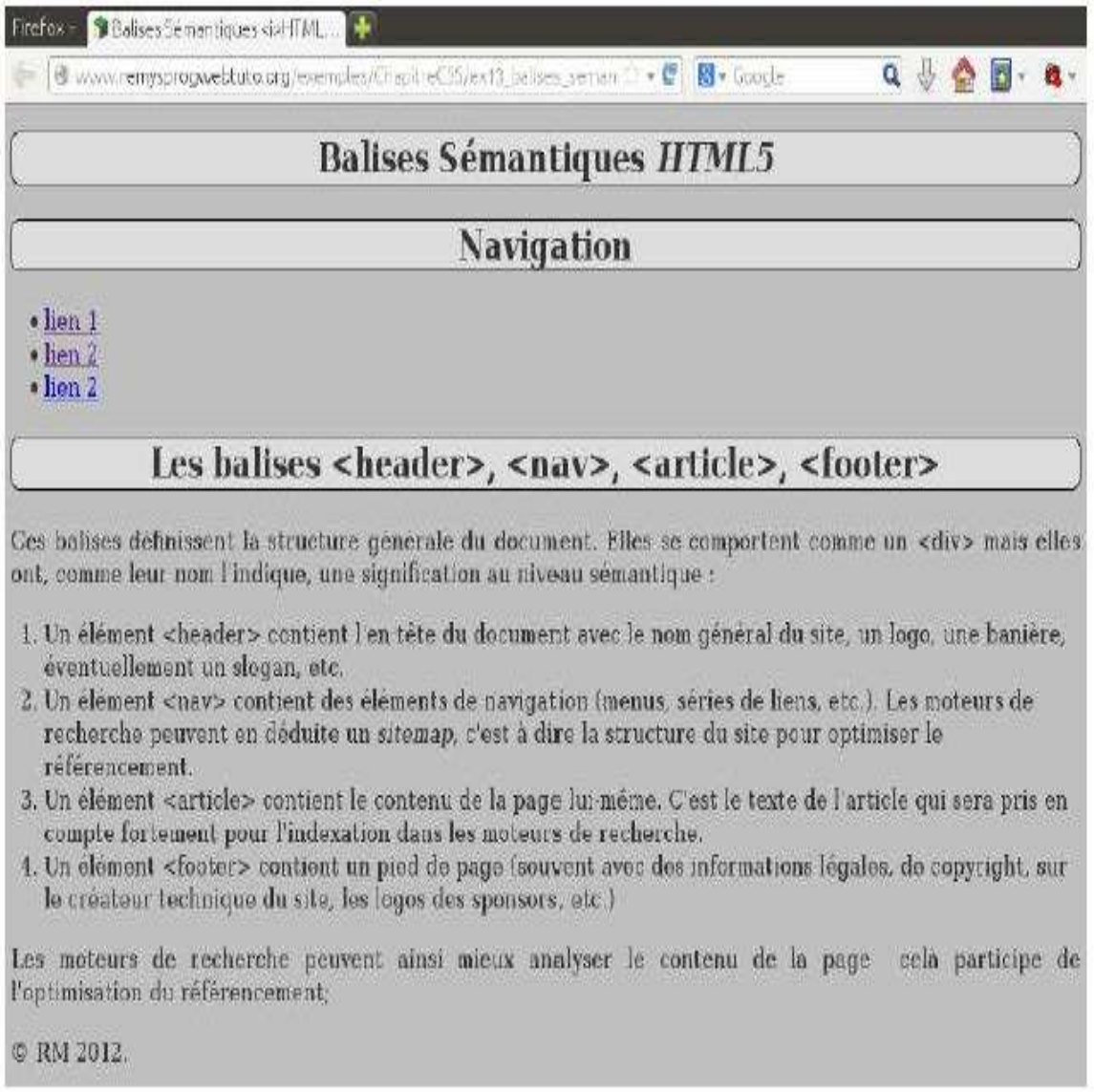
- One ofthe significant advancement in HTML5 was the introduction of structural elements.

- The idea was to enhance semantics and make layout structuring easier.
- The introduced structural elements include:

  - <**section**>: A generic section grouping content related to the same subject or functionality.
  - <**article**>: An independent content section that can be individually extracted from the document.
  - <**nav**>: Asection containing primary navigation links (within the document or to other pages).
  - <**aside**>: A section with complementary content, not necessary directly related to the surrounding content but providing additional infromation.
  - <**header**>: An introductory section of an article, another section, or the entire document (page header).
  - <**footer**>: a concluding section of a section or an article, or even the entire document (page footer).

Main HTML Tags





This layout can only be acheived by using CSS to specify the display of the elements.

Web Forms

- Forms allow the retreival of information provided by users such as comments, login credentials, delivery adresses, credit card numbers, product choices, and more.

- **<form>** tag: group all the fields intented to gather information from users.

- The general syntax of this tag is presentes below.

```
<form id="idFormulaire" method="POST" action="cible.php">
<!-- ici les différents champs du formulaire -->
</form>
```

Web Forms

- The most used attributes of **<form> are as follows:**

  - **method:** specifies the HTTP method to be used when sending form data. Possible values are **GET** and **POST**. When the form contains non-textual data(such as an attached file), only POST method is possible.

  - **action:** This attribute desinates the script in the server side.

HTML5 Form Elements

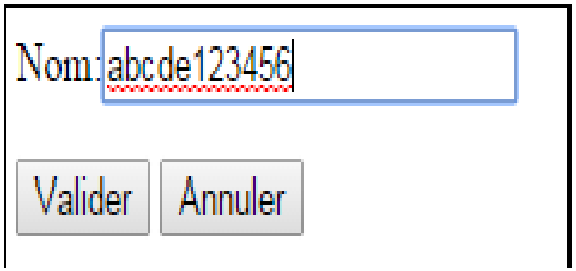
<input>

- This element allows users to input data.
- The type of data it can accept ranges from text to selection among a set of radio buttons.
- Overall syntax is given in the following code:

```
<input name="string" type="typeinput" value="value" required/>
```

HTML5 Form Elements

```
<form id="form_abonner" method="post"       action="enregistrer.php" >
    Nom:<input type="text" id="nom" name="nom" required>
<p>
<button type="submit">Valider</button>
<button type="reset">Annuler</button>
</p>
</form>
```



- In this form, the user can input alphanumeric text, but the presence of the **required** attribute prevents them from submitting the form while leaving this field empty.

HTML5 Form Elements

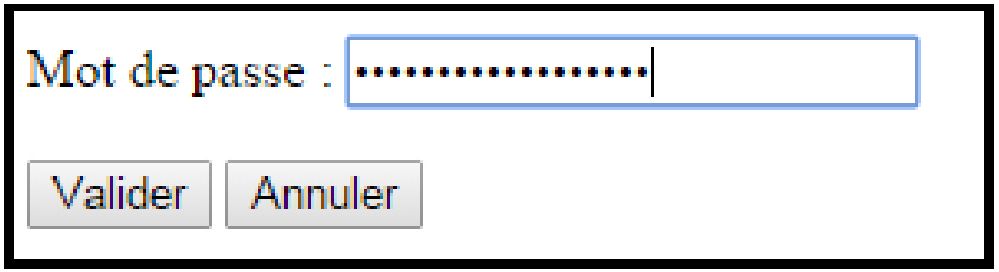
- In the older version of HTML, checking types often required writing JavaScript code or cerifying it in a server-side script.

- The solution introduced in HTML involves having types of <input type=text> that correspond to specific patterns.

- Some of these types include: email (Email adress), url (URL), tel(phone numbers), date (for a date), datetime (for date ans time), time, week, month, number, and more.

HTML5 Form Elements

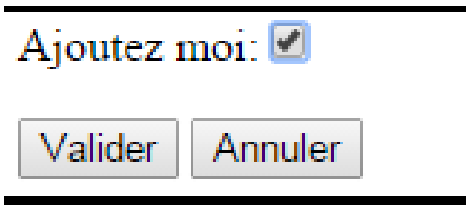
- For the **color** type, it provides access to the color picker.
  - Color:<input type=”color” id=”unecouleur” name=”unecouleur”>
- The password type allows for a field designed to acommodate a password. Its behavior is to replace the caracters enteredby the user with other caracters, preventing the text from being read in palin taxt.
  - Password: <input type=”password” id=”nom” name=”nom” required>



HTML5 Form Elements

- The **checkbox** type used when the user needs to respond with yes or no. It is represente by a checkbox.

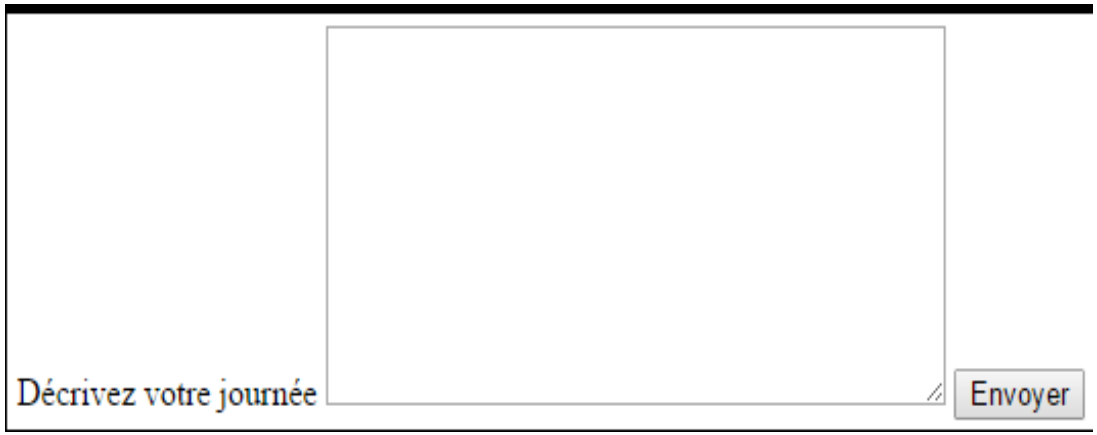
  - Ajoutez moi:<input type=”checkbox” id=”uncb” name=”uncb”>



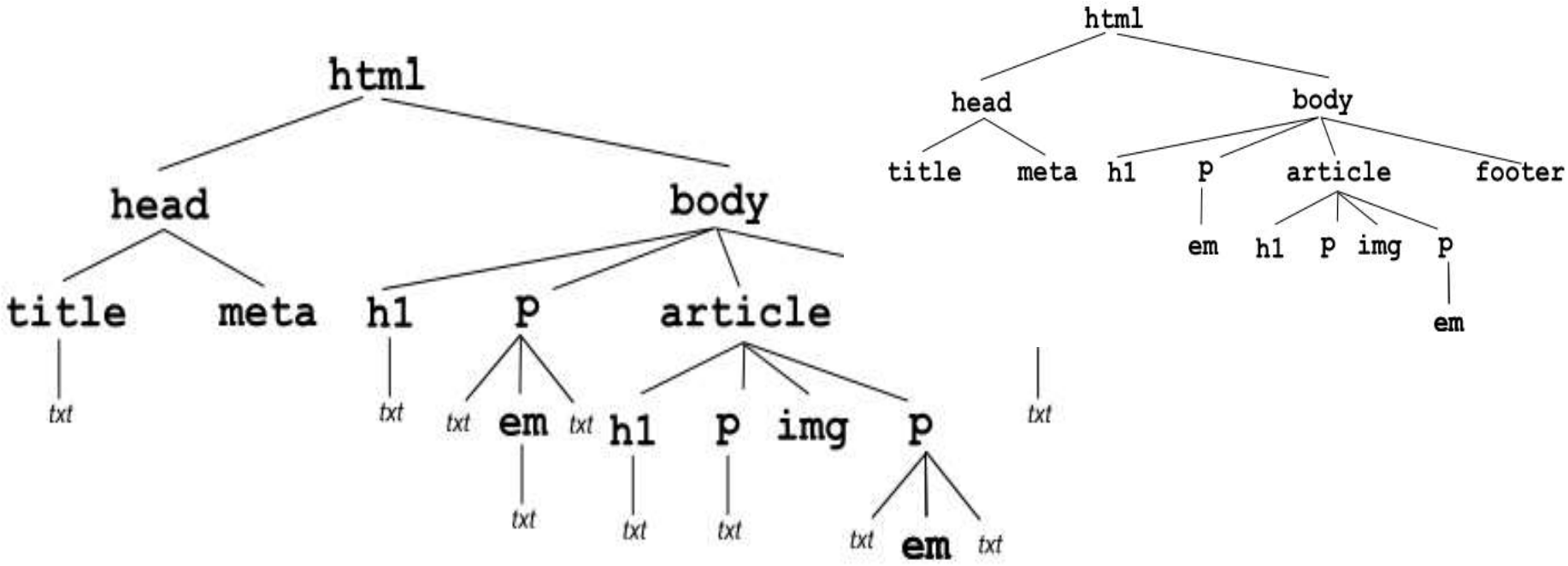
HTML5 Form Elements

- The **<textarea>** element allows to have a field that spans over multiple lines. For instance, when you enter a comment on a Yahoo! article, this type of control is presented to you.

```
<form action=”process.php” method=”POST”>
    Décrivez votre journée <textarea cols=”40” rows=”10”> </textarea>
    <button type=”submit”>Envoyer</button>
</form>
```

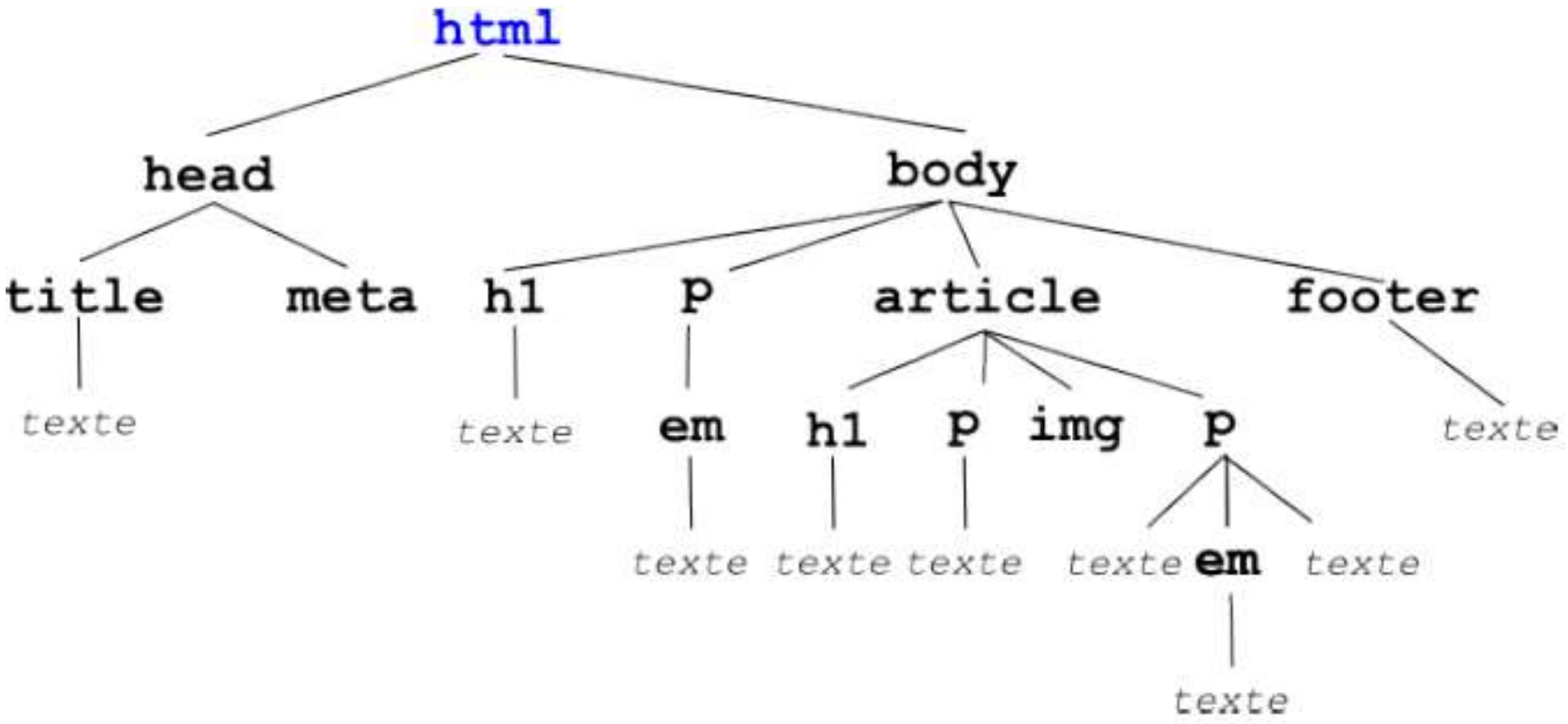


- **DOM Tree**
  - An HTML document is represented using a tree refered as DOM (Document Object Model).
  - Nodes of the tree are the elements.
  - Most often, **txt** nodes are ignored.



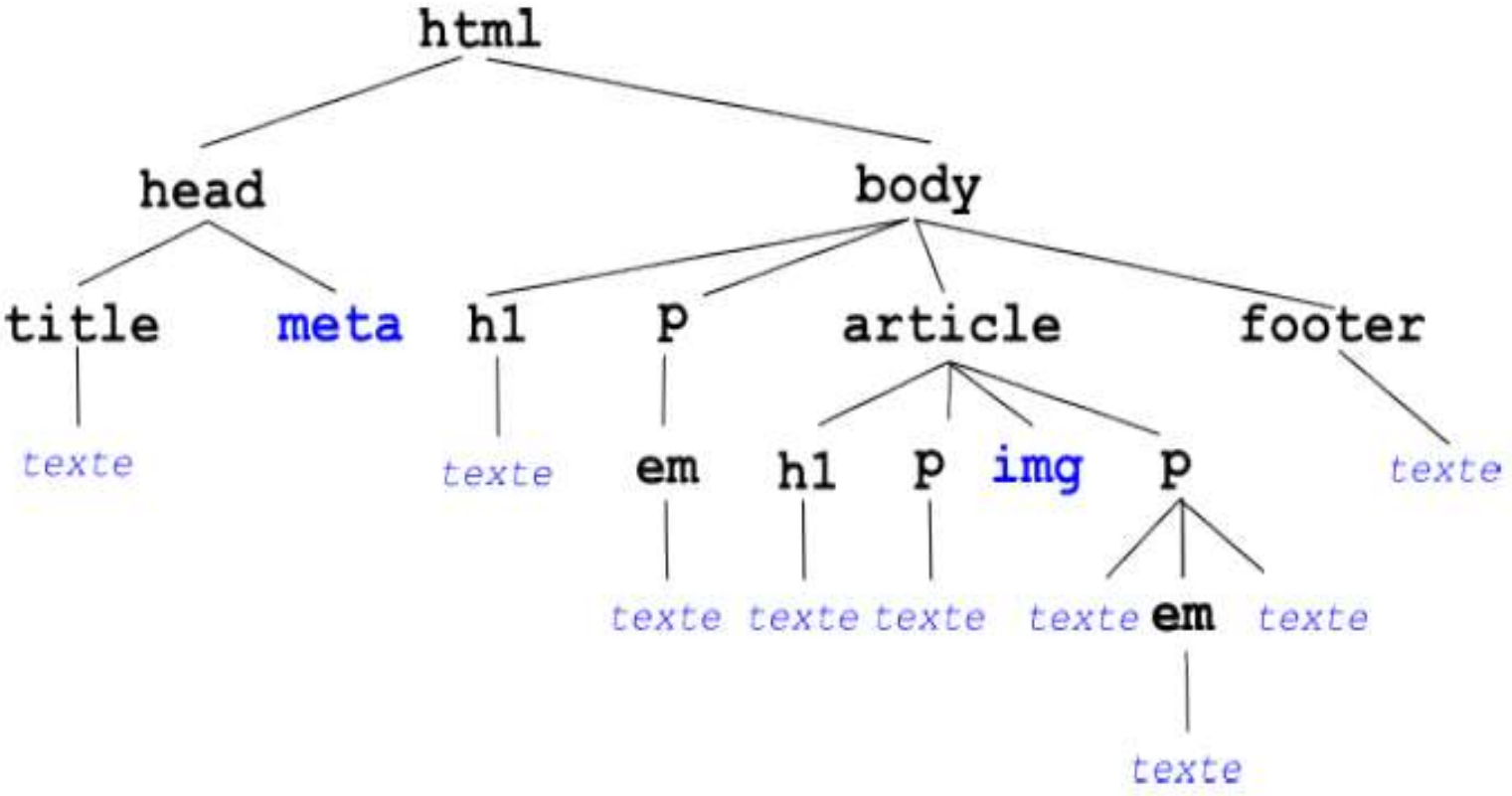
Vocabulary about trees

- **Root** node of the tree



Vocabulary about trees

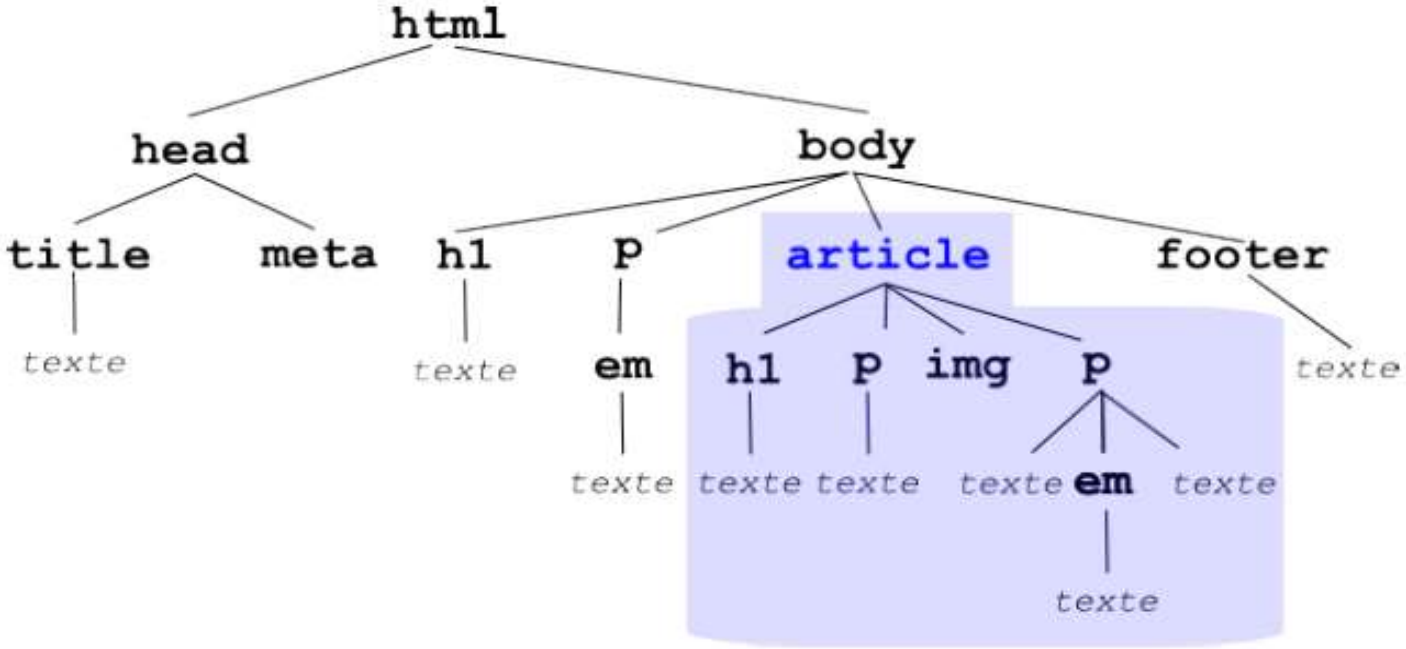
- **Leaf** nodes of the tree.



Vocabulary about trees

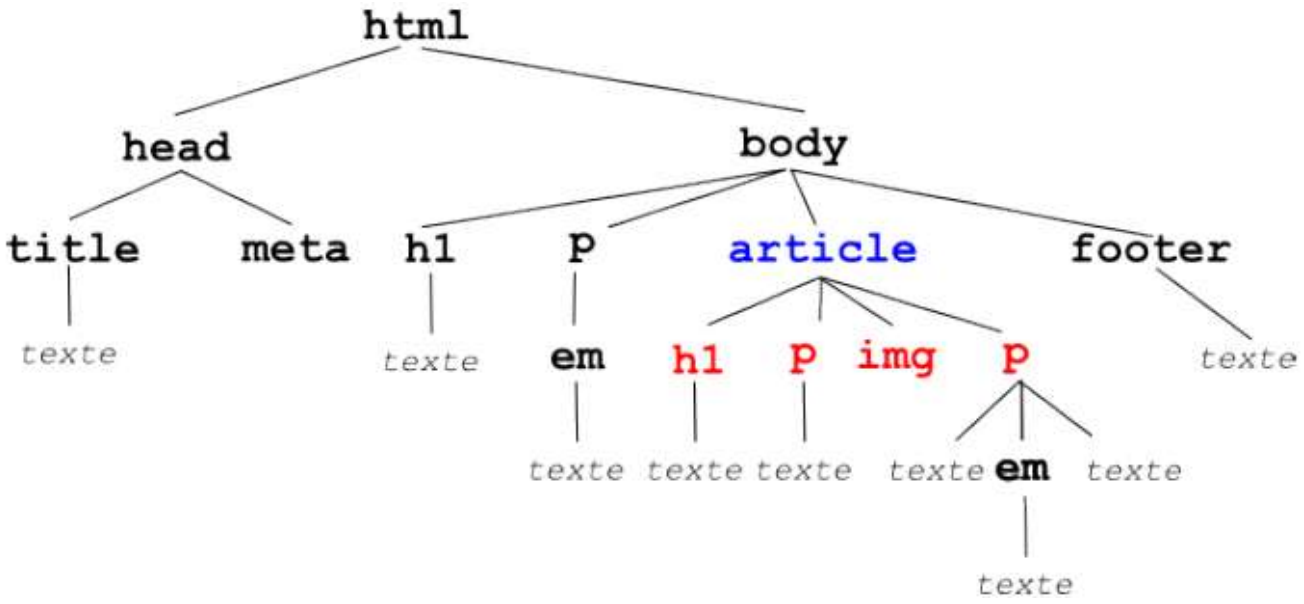
- **Subtree and descendants**

  - **Subtree** of the root: the ‘article’ node.
  - The nodes within this subtree are the **descendants** of the ‘article’ node.



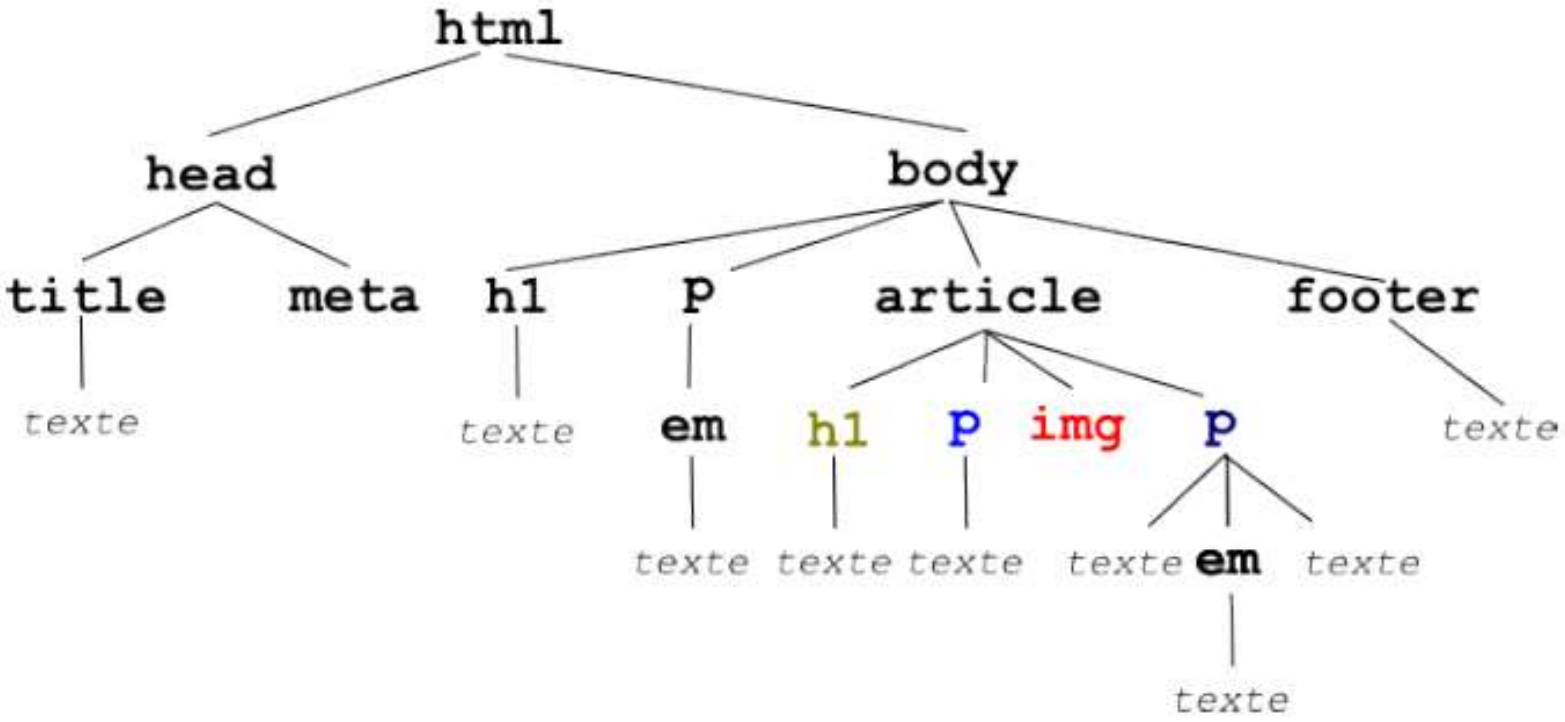
Vocabulary about trees

- **Parent and children**
  - The ‘article’ node is the parent of the ‘h1’, ‘p’, ‘img’, and ‘p’ nodes.
  - ‘h1’,’p’, ‘img’, and ‘p’ nodes are the children of the ‘article’ node.



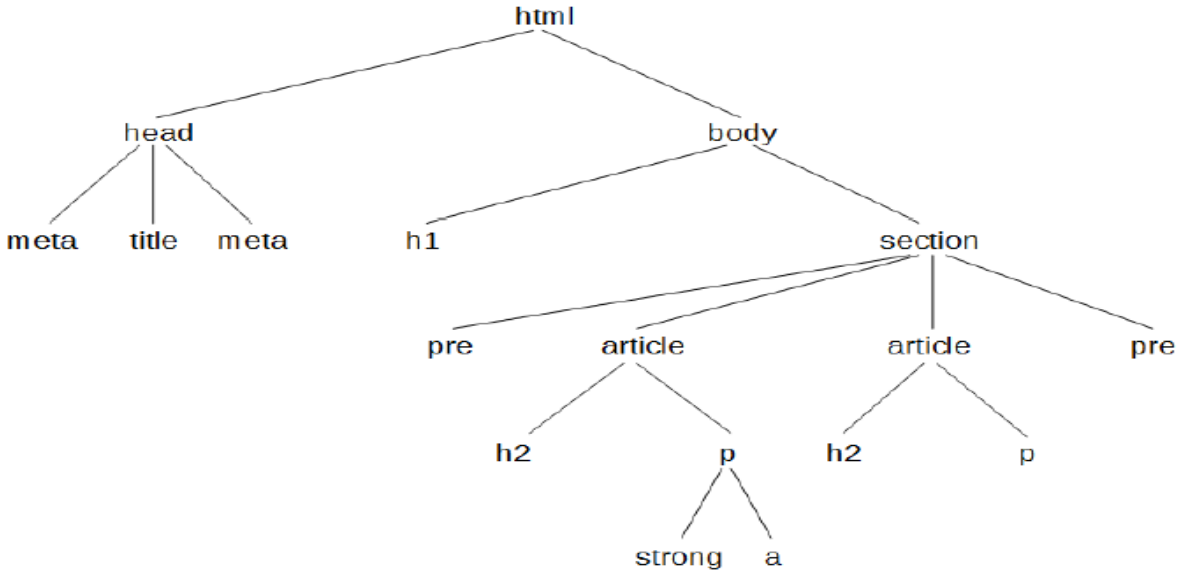
Vocabulary about trees

- **Siblings**
  - The ‘h1’, ‘p’, ‘img’, and ‘p’ nodes are siblings.



Building the DOM Tree

- We browse the document sequentially.
- Each element becomes a new node.
- If the element **<elt>** is nested whithin the element **<box>**, the node **elt** is a child of the node **box**.
- Nodes of the elements nested at the same level are siblings. They follow ‘from left to right’ according to their appearance order in the document.



The Browser

- Interprets the DOM tree of the document to display the page.
- Each element/node occupies a rectangular area on the page → « box »
- Any modification of the DOM structure is reproduced → dynamic pages.