HTML 5 – Part I
Introduction, HTML, structure, semantics and forms

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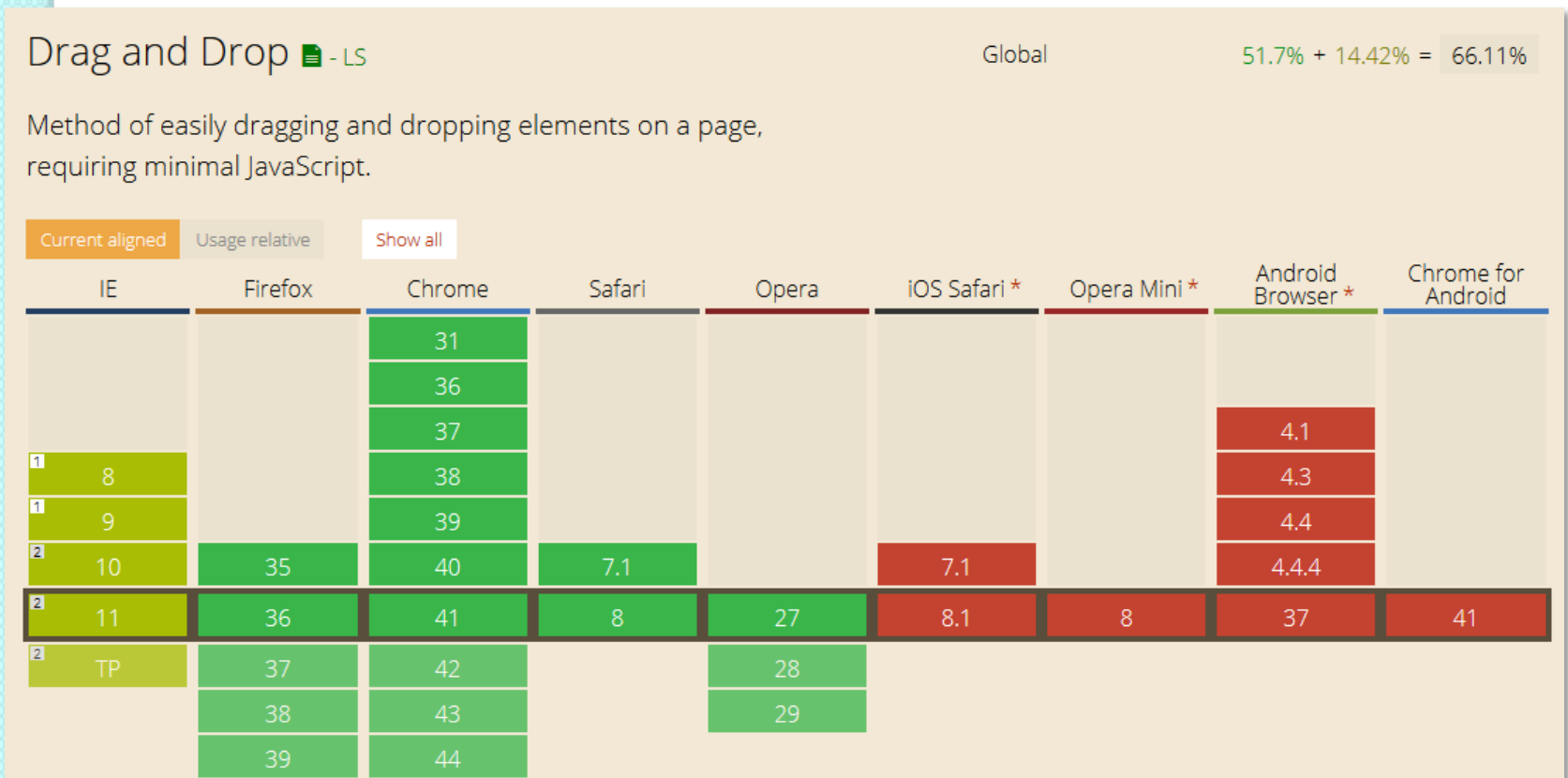
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HTML 5

- HTML5 is the last major revision of the Hypertext Markup Language (HTML) standard
  - W3C Recommendation 28 October 2014
  - FollowS its predecessors HTML 4.01 and XHTML 1.1
- Work on the specifications started in June 2004
- Currently being carried out in a joint effort between the W3C HTML WG and the WHATWG (Hypertext Application Technology Working Group)

Supported features

- Depends on browser
- Compatibility tables for every feature
  - E.g. http://caniuse.com/

Drag and Drop 📄 - LS

Global   51.7% + 14.42% = 66.11%

Method of easily dragging and dropping elements on a page, requiring minimal JavaScript.

| Current aligned | Usage relative | Show all | | | | | | |

IE	Firefox	Chrome	Safari	Opera	iOS Safari *	Opera Mini *	Android Browser *	Chrome for Android
		31						
		36						
		37					4.1	
[1] 8		38					4.3	
[1] 9		39					4.4	
[2] 10	35	40	7.1		7.1		4.4.4	
[2] 11	36	41	8	27	8.1	8	37	41
[2] TP	37	42		28				
	38	43		29				
	39	44						

The HTML5 test

- How well does your browser support HTML5?
  - http://html5test.com/
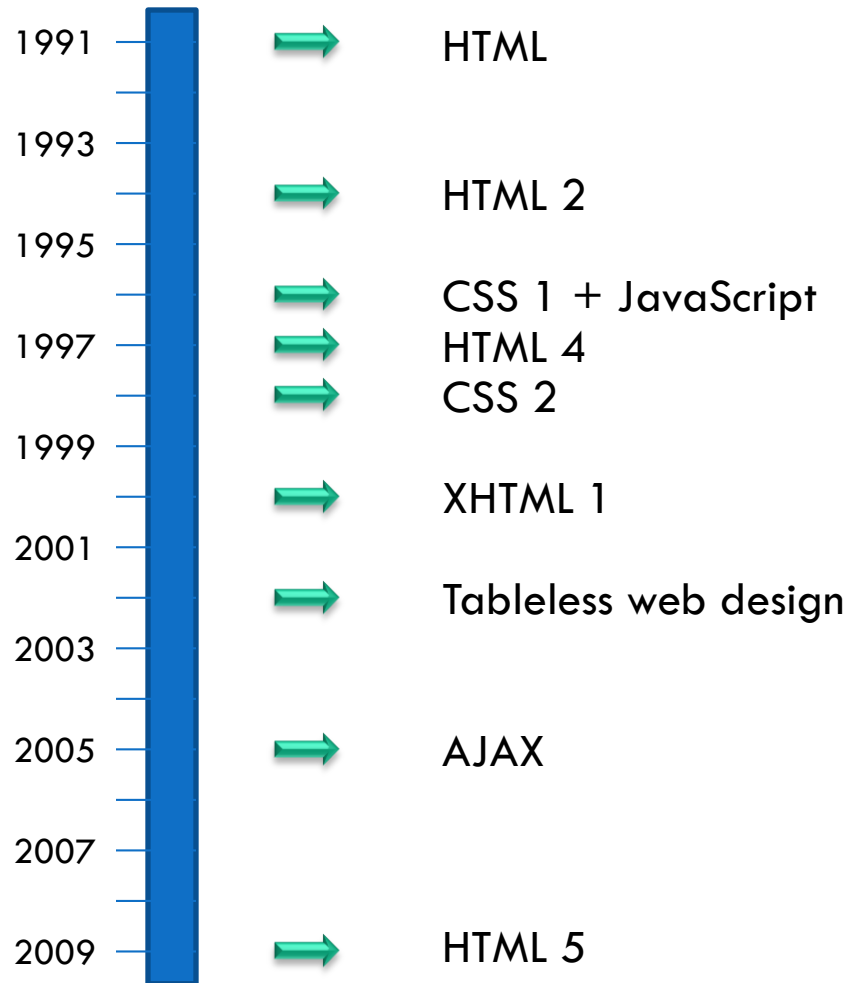
YOUR BROWSER SCORES **449** OUT OF 555 POINTS

You are using Firefox 36.0 on Windows 7   Correct? ✓ ✕

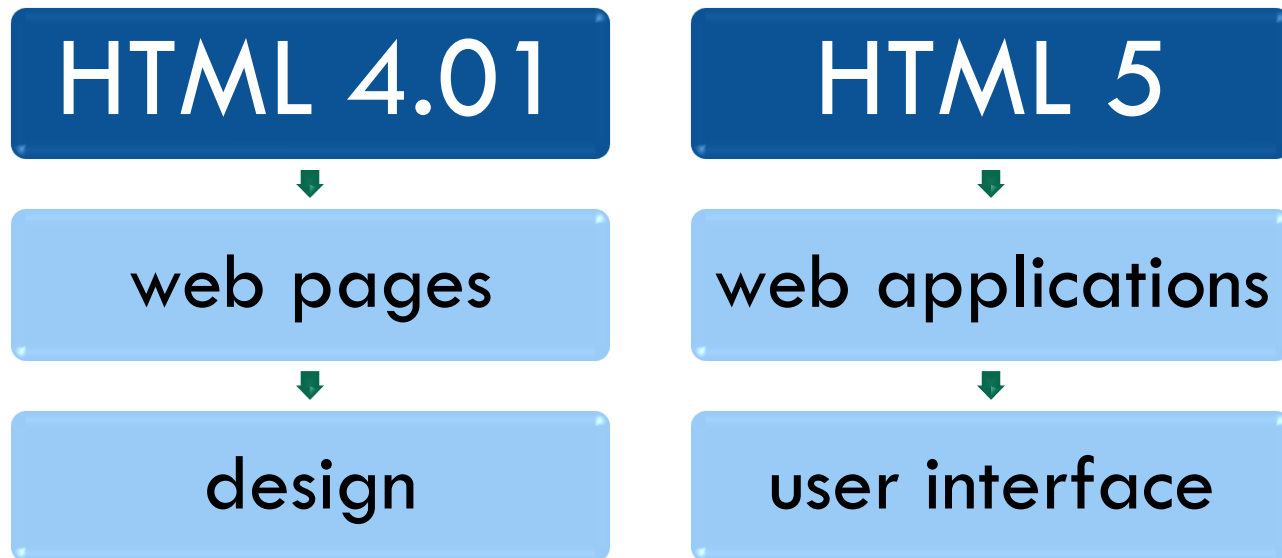| ☁ Save results | ▦ Compare to... | ◄ Share | ℗ Donate |

⟫ semantics

Parsing rules	5
`<!DOCTYPE html>` triggers standards mode	Yes ✓
HTML5 tokenizer	Yes ✓
HTML5 tree building	Yes ✓

HTML5 defines rules for embedding SVG and MathML inside a regular HTML document. The following tests only check if the browser is following the HTML5 parsing rules for inline SVG and MathML, not if the browser can actually understand and render it.

⬚ multimedia

Video	29/35
video element	Yes ✓
Subtitles	Yes ✓
Audio track selection	No ✕
Video track selection	No ✕
Poster images	Yes ✓
Codec detection	Yes ✓

4

Rough timeline of web technologies

Year	Technology
1991	HTML
1993	
1995	HTML 2
	CSS 1 + JavaScript
1997	HTML 4
	CSS 2
1999	XHTML 1
2001	
	Tableless web design
2003	
2005	AJAX
2007	
2009	HTML 5

HTML 5

- HTML5 ~= HTML + CSS + JS API

HTML 4.01	HTML 5
↓	↓
web pages	web applications
↓	↓
design	user interface

Rationale

- "This specification defines the 5th major revision of the core language of the World Wide Web: the Hypertext Markup Language (HTML). In this version, <u>new features</u> are introduced to help Web application authors, <u>new elements</u> are introduced based on research into prevailing authoring practices, and special attention has been given to defining clear <u>conformance criteria for user agents</u> in an effort to improve interoperability. This specification is intended to replace (be a new version of) what was previously the HTML4, XHTML 1.0, and DOM2 HTML specifications."
- Specifications in A4 format: 690 pages (~War and Peace by Leo Tolstoy)

Il linguaggio HTML

- Basic concepts
- User interface in HTML
  - Forms
  - Tables

Basics

- HTML: HyperText Markup Language
- "De facto" standard
  - W3C: World Wide Web Consortium
  - http://www.w3.org/
- Continuous evolution
  - Born in 1991
  - HTML, HTML 2, HTML 4, XHTML 1, HTML 5
- Goal: to describe the structure of hypertext documents independently of computer platform
- Pure text: based on the first 127 characters of ASCII code

Basics

- HTML allows to describe a text by markimg down the various part that compose the document
  - Annotations use "tags"
- To visualize HTML documents: browser
  - Browsers interpret tags to visualize text in the proper way I browser ignorano i tag non riconosciuti
- To edit HTML documents: any text editor
  - Notepad, Notepad+, …
  - HAPedit, http://hapedit.free.fr/
  - RubyMine

Tags

- Each HTML tag describes different document content
- A tag is an expression between acute brackets (< >)
- Usually text portions are delimited by tag couples (e.g. <h1>Title</h1>)
- General rule: the final tag is identical to the initial one but starts with the / symbol
- Empty tags, i.e. that are not applied to a text, are written like this:

Attributes

- Tag can be better specified through attributes

- Example: specify that an image in aligned on the right or on the left, define the color od some text, specify the width of a table column, …

- Attributes are variables with an assigned value
  - e.g. width="100"

HTML document structure

```
01 <html>
02
03 <head>
04 <title>Esempio di prova</title>          ⎫
05 ...                                        ⎬ Header
06 </head>                                    ⎭
07
08 <body bgcolor="#FFFFFF">                   ⎫
09 ...                                        ⎬ Body
10 ...
11 </body>                                    ⎭
12
13 </html>
```
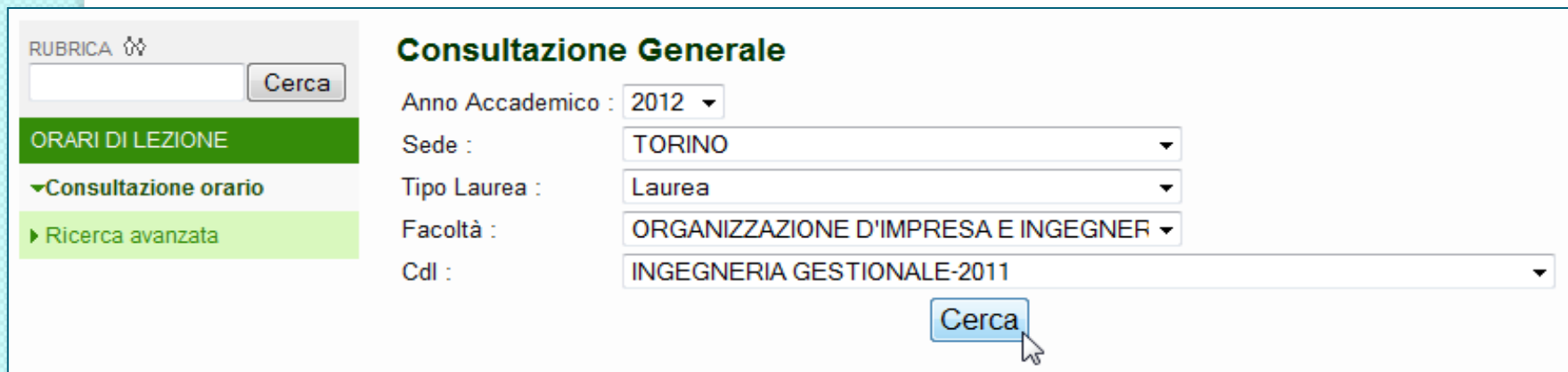
- Body: anything in the browser window

HTML expressiveness

- What can HTML do?
  - Create static web pages
- What cannot HTML do?
  - Create dynamic web pages
- Dynamic web pages
  - Created "on the fly" in response to user input

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Dynamic web pages

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	lunedì 21/11/2011	martedì 22/11/2011	mercoledì
8 00			
9 00		**Statistica** FONTANA ROBERTO HA - ZZ LEP	**Statistica** FONTANA ROBERTO HA - ZZ 13	
10 00	**Analisi matematica II** UGAGLIA LUCA HA - ZZ 16	**Statistica** FONTANA ROBERTO HA - ZZ 13	**Statistica** FONTANA ROBERTO HA - ZZ LEP	
11 00				**Statistica** FONTANA ROBER HA - ZZ 4
12 00				
13 00	**Basi di dati** FARINETTI LAURA HA - ZZ 4		
14 00			
15 00		**Analisi matematica II** UGAGLIA LUCA HA - ZZ 7T	
16 00			
17 00			

User interface
(static web page, HTML)

Query result
(dynamic web page, ???)

More details …

- With HTML you can …
  - Write and format text (including ordered and unordered lists, …)
  - Define colors, fonts, backgrounds, …
  - Insert images, audio, video
  - Insert hypertext links
  - Insert tables
  - Inserts forms
  - …

An example

Lezione 9: Immagini

Non sarebbe bello poter aggiungere una foto di Tim Bernes-Lee, l'inventore dell'HTML, proprio al centro della tua pagina?
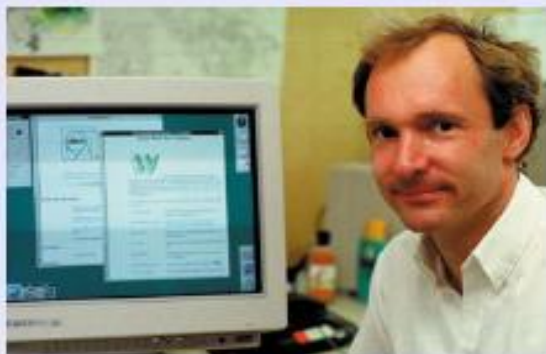
Suona come un compito difficile...

Forse, ma invece è decisamente facile farlo. Tutto quello che ti serve è un elemento:

Esempio 1:

```
<img src="tim.jpg" alt="Tim" />
```

sul tuo browser apparirà così:

An example

```html
<html>

<head>
<title>Esempio</title>
<meta http-equiv="content-type" content="text/html; charset=iso-8859-1" />
<meta name="generator" content="HAPedit 3.1">
</head>

<body bgcolor="Lavender">
<font face="Arial">
 <h1>Lezione 9: Immagini</h1>

 <p>Non sarebbe bello poter aggiungere una foto di Tim Bernes-Lee, l'inventore
 dell'HTML, proprio al centro della tua pagina?</p>

 <h2>Suona come un compito difficile...</h2>
 <p>Forse, ma invece &egrave; decisamente facile farlo.
 Tutto quello che ti serve &egrave; un elemento:</p>

 <p><strong>Esempio 1:</strong></p>

 <pre>
 &lt;img src=&quot;tim.jpg&quot; alt=&quot;Tim&quot; /&gt;
 </pre>

 <p>sul tuo browser apparir&agrave; cos&igrave;:</p>
 <img src="tim.jpg" height="150" aligh="center" alt="Tim" />
```

An example

Ci sono tre tipi diversi di file immagine che possono essere inseriti nelle tue pagine:

- GIF (Graphics Interchange Format)
- JPG / JPEG (Joint Photographic Experts Group)
- PNG (Portable Network Graphics)

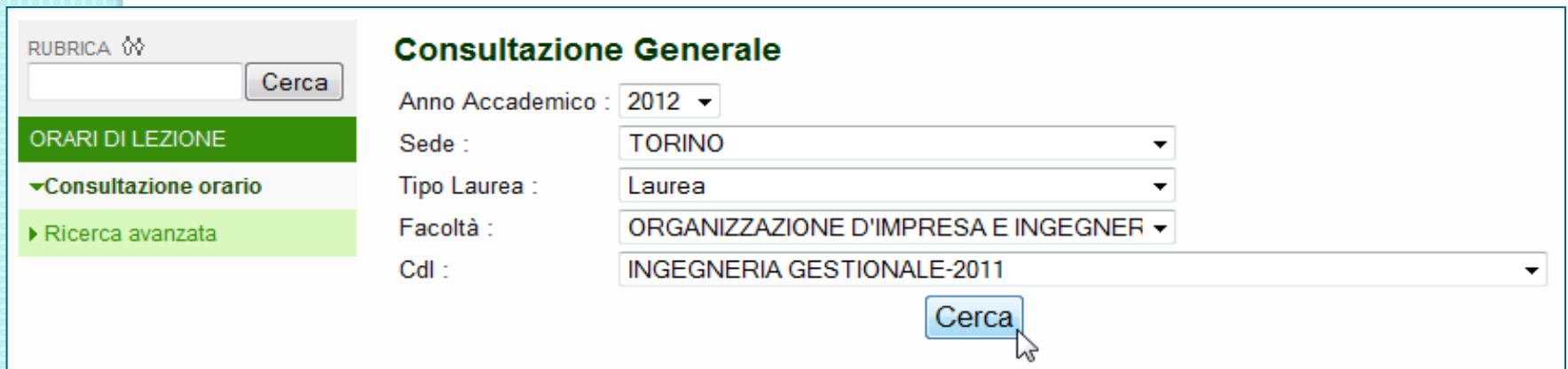**Le immagini GIF generalmente sono migliori per i grafici e i disegni, mentre le immaginni JPEG sono migliori per le fotografie**. Questo per due ragioni principali: primo, le immagini GIF possono avere solo 256 colori, mentre le immagini JPEG sono formate da milioni di colori e secondo, il formato GIF è migliore per comprimere immagini semplici, mentre il formato JPEG è stato ottimizzato per immagini più complesse.

Da dove prendo le mie immagini?

Per fare le tue immagini ti serve un programma apposito per l'editing delle immagini. **Un programma di editing delle immagini è uno degli strumenti più importanti per creare dei siti web bellissimi**.

An example

```html
<p>Ci sono tre tipi diversi di file immagine che possono essere inseriti
nelle tue pagine:</p>

<ul>
  <li>GIF (Graphics Interchange Format)</li>
  <li>JPG / JPEG (Joint Photographic Experts Group)</li>
  <li>PNG (Portable Network Graphics) </li>
</ul>

<p align="justify"><strong>Le immagini GIF generalmente sono migliori per i
grafici e i   disegni, mentre le immaginni JPEG sono migliori per le
fotografie</strong>.
Questo per due ragioni principali: primo, le immagini GIF possono avere
solo 256 colori, mentre le immagini JPEG sono formate da milioni di colori
e secondo, il formato GIF &egrave; migliore per comprimere immagini semplici,
mentre il formato JPEG &egrave; stato ottimizzato per immagini pi&ugrave;
complesse.</p>

<h2>Da dove prendo le mie immagini?</h2>
<p>Per fare le tue immagini ti serve un programma apposito per
l'editing delle immagini. <strong><font color="red">Un programma di editing
delle immagini &egrave; uno degli strumenti pi&ugrave; importanti
per creare dei siti web bellissimi</font></strong>.</p>
```

User interface

- Data can be passed to the applications for further processing
  - User input
- In HTML you can use
  - Forms
  - Tables

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Form example

	Articolo	Immagine	Taglia	Quantità	Prezzo (taglia medium)
☑	Maglia girocollo arancio		small ▼	1	61.00 €
☐	Maglia dolcevita blu		medium ▼	0	70.20 €
☑	Camicia righe azzurre		medium ▼ / small / medium / large	3	25.00 €
☑	Tuta ginnastica		large ▼	2	45.70 €
☐	Pantalone velluto grigio		medium ▼	0	53.50 €

Modalità di pagamento:
- ○ Contanti alla consegna
- ◉ Tessera prepagata
- ○ Carta di credito (2.50 € di commissione)

[Invia l'ordine] [Annulla]

- Input elements
  - Interactive
  - Non interactive

Form creation

```
<form name = "datiUtenti" action = "URI" method = "POST" >
    Elementi di input
</form>
```

- "Form" tag with a few attributes
  - Name: form name
  - Action: URI (resource) that will take care of data processing
  - Method: method for passing parameters from the form to the destination URI (can be "POST" or "GET"
    or "PUT")
- A form contains several input elements

Form example

	Articolo	Immagine	Taglia	Quantità	Prezzo (taglia medium)
☑	Maglia girocollo arancio		small ▼	1	61.00 €
☐	Maglia dolcevita blu		medium ▼	0	70.20 €
☑	Camicia righe azzurre		medium ▼ / small / medium / large	3	25.00 €
☑	Tuta ginnastica		large ▼	2	45.70 €
☐	Pantalone velluto grigio		medium ▼	0	53.50 €

Modalità di pagamento:
- ○ Contanti alla consegna
- ● Tessera prepagata
- ○ Carta di credito (2.50 € di commissione)

Invia l'ordine   Annulla

- Input elements
  - Text field
  - Checkbox
  - Radio button
  - "submit" button
  - "reset" button
  - …

  - Text
  - Images

Input elements

- General structure (with a few exceptions)

```
<input type="text" name="indirizzo" size="30"
       value="Inserisci qui il tuo indirizzo" />
```

- Tag "input" with some attributes
  - type: type of the element
  - name: name of the element
  - value: the valued that the form passes to the destination URI
  - Other attributes specific to the element type (e.g. size for input type "text")

Input element example


```html
<input type="checkbox" name="art3" value="1" />
```

```html
<input type="image" name="camicia" src="./img/camicia_righe.jpg" height="80"/>
```

```html
<select name="dim3">
    <option value="1">small</option>
    <option value="2" selected>medium</option>
    <option value="3">large</option>
</select>
```

```html
<input type="text" name="q3" value="0" size="2" />
```

Input element example

Modalità di pagamento:
- ⚪ Contanti alla consegna
- 🔘 Tessera prepagata
- ⚪ Carta di credito (2.50 € di commissione)

Element selected during page loading

```
<input type="radio" name="pag" value="0" checked />Contanti alla consegna<br />
<input type="radio" name="pag" value="1" />Tessera prepagata<br />
<input type="radio" name="pag" value="2" />Carta di credito
        (2.50 € di commissione)
```

Important: same name

| Invia l'ordine | Annulla |

```
<input type="submit" name="invia" value="Invia l'ordine" />
<input type="reset" name="annulla" value="Annulla" />
```

Input elements

- Submit button: executes a call to the URI specified in the action attribute of the form
  - input type="submit"
- Reset button: clears all form data
  - input type="reset"
- Text field
  - input type="text"
- Checkbox
  - input type="checkbox"
- Radio button
  - input type="radio"
- Image
  - input type="image"
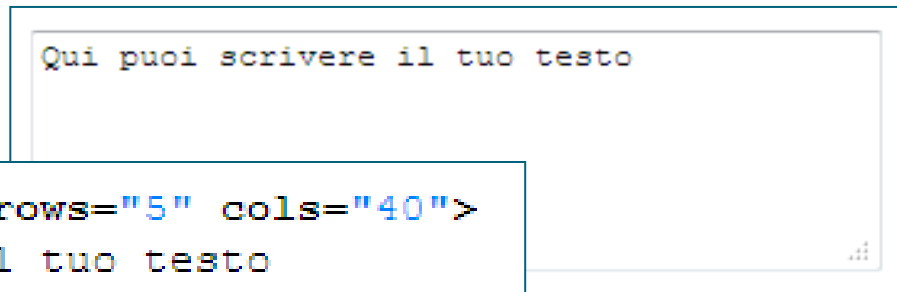
Input elements

- Password fields: shows   bullets or stars instead of characters
  - ◦ input type="password"


```
<input type="password" maxlength="8" size="18" name="passwd" />
```

- Textarea field
  - ◦ textarea

Qui puoi scrivere il tuo testo

```
<textarea name="testo" rows="5" cols="40">
    Qui puoi scrivere il tuo testo
</textarea>
```

- Menu
  - ◦ select

Input elements

- File

  ◦ input type="file"

```
<input name="fileUtente" type="file" size="20" />
```
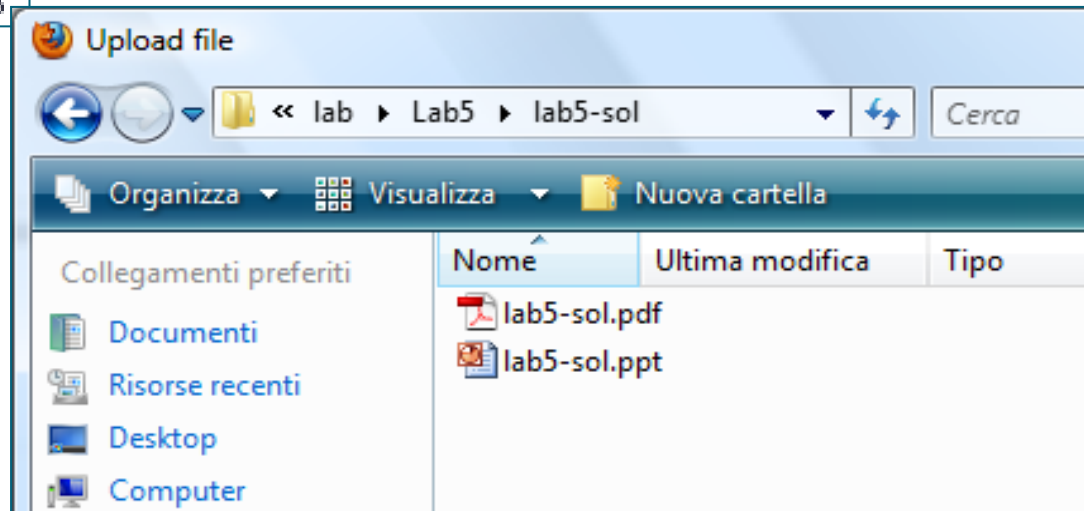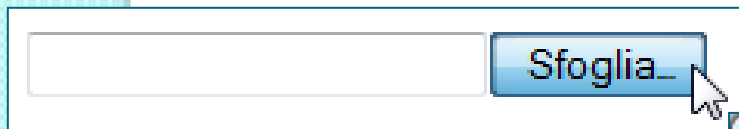
Tables

- Basic structure
  - Rows (table row)
  - Cells (table data)

prima cella	seconda cella
terza cella	quarta cella

```html
<table border="1">
  <tr>
     <td>prima cella</td>
     <td>seconda cella</td>
  </tr>
  <tr>
    <td>terza cella</td>
    <td>quarta cella</td>
  </tr>
</table>
```

Tables

- You can define column width

prima cella	seconda cella
terza cella	quarta cella

```html
<table border="1">
  <tr>
      <td width="100">prima cella</td>
      <td width="100">seconda cella</td>
  </tr>
  <tr>
    <td>terza cella</td>
    <td>quarta cella</td>
  </tr>
</table>
```

Tables

- You can define the header of the table
  - Table header

CodP	NomeP	Colore	Taglia	Magazzino
P1	Maglia	Rosso	40	Torino
P2	Jeans	Verde	48	Milano
P3	Camicia	Blu	48	Roma
P4	Camicia	Blu	44	Torino
P5	Gonna	Blu	40	Milano
P6	Bermuda	Rosso	42	Torino

Tables

- You can define the header of the table
  - Table header

```
<table width="50%" border="1">
  <tr>
      <th width="15%">CodP</td>
      <th width="25%">NomeP</td>
      <th width="20%">Colore</td>
      <th width="15%">Taglia</td>
      <th width="25%">Magazzino</td>
  </tr>
  <tr>
    <td>P1</td>
    <td>Maglia</td>
    <td>Rosso</td>
    <td>40</td>
    <td>Torino</td>
  </tr>
  ............................................
  <tr>
    <td>P6</td>
    <td>Bermuda</td>
    <td>Rosso</td>
    <td>42</td>
    <td>Torino</td>
  </tr>
</table>
```

Form and tables

- Tables are often used together with forms for aesthetic purposes

	Articolo	Immagine	Taglia	Quantità	Prezzo (taglia medium)
☐	Maglia girocollo arancio		medium ▾	0	61.00 €
☐	Maglia dolcevita blu		medium ▾	0	70.20 €

Form and tables – example 1

```html
<form name="mioForm" action="ordine.php" method="GET">
<table border="1">
  <tr>
    <th width="30"></th>
    <th width="100">Articolo</th>
    <th width="100">Immagine</th>
    <th width="100">Taglia</th>
    <th width="100">Quantit&agrave;</th>
    <th width="100">Prezzo (taglia medium)</th>
  </tr>
  <tr>
    <td align="center"><input type="checkbox" name="art1" value="1" /></td>
    <td>Maglia girocollo arancio</td>
    <td align="center"><input type="image" name="arancio"
      src="./img/maglia_arancio.jpg" height="80" /></td>
    <td>
      <select name="dim1">
         <option value="1">small</option>
         <option value="2" selected>medium</option>
         <option value="3">large</option>
       </select>
    </td>
    <td align="center"><input type="text" name="q1" value="0" size="2" /></td>
    <td align="center">61.00 €</td>
  </tr>
  ......................................
</table>
```

Form and tables – example 2

Modalità di pagamento:

- ⦿ Contanti alla consegna
- ○ Tessera prepagata
- ○ Carta di credito (2.50 € di commissione)

[Invia l'ordine] [Annulla]

```
Modalit&agrave di pagamento:
<table border="0">
  <tr>
    <td width="300">
      <input type="radio" name="pag"
             value="0" checked />Contanti alla consegna<br />
      <input type="radio" name="pag" value="1" />Tessera prepagata<br />
      <input type="radio" name="pag" value="2" />Carta di credito
             (2.50 € di commissione)
    </td>
    <td>
      <input type="button" name="invia" value="Invia l'ordine" />
      <input type="reset" name="annulla" value="Annulla" />
    <td>
  </tr>
</table>
```

Exercise

- Create a simple HTML page (e.g. educational: to explain a topic that you are learning) that contains, at least
  - Some text
  - A few images
  - A form
  - Several links
- Do not delete it!
  - (to be used later on with CSS styles)

HTML5: new features wrt HTML

- The canvas element for drawing
- The video and audio elements for media playback
- Better support for local offline storage
- New content specific elements, like article, footer, header, nav, section
- New form controls, like calendar, date, time, email, url, search
- HTML 4.01 obsolete or never used elements are deleted or re-written

HTML5 overview

Triangle diagram showing HTML5 components:
- Structure & Semantics (top)
- APIs -- HTML5 Spec (bottom left)
- APIs -- NOT in Spec (bottom right)
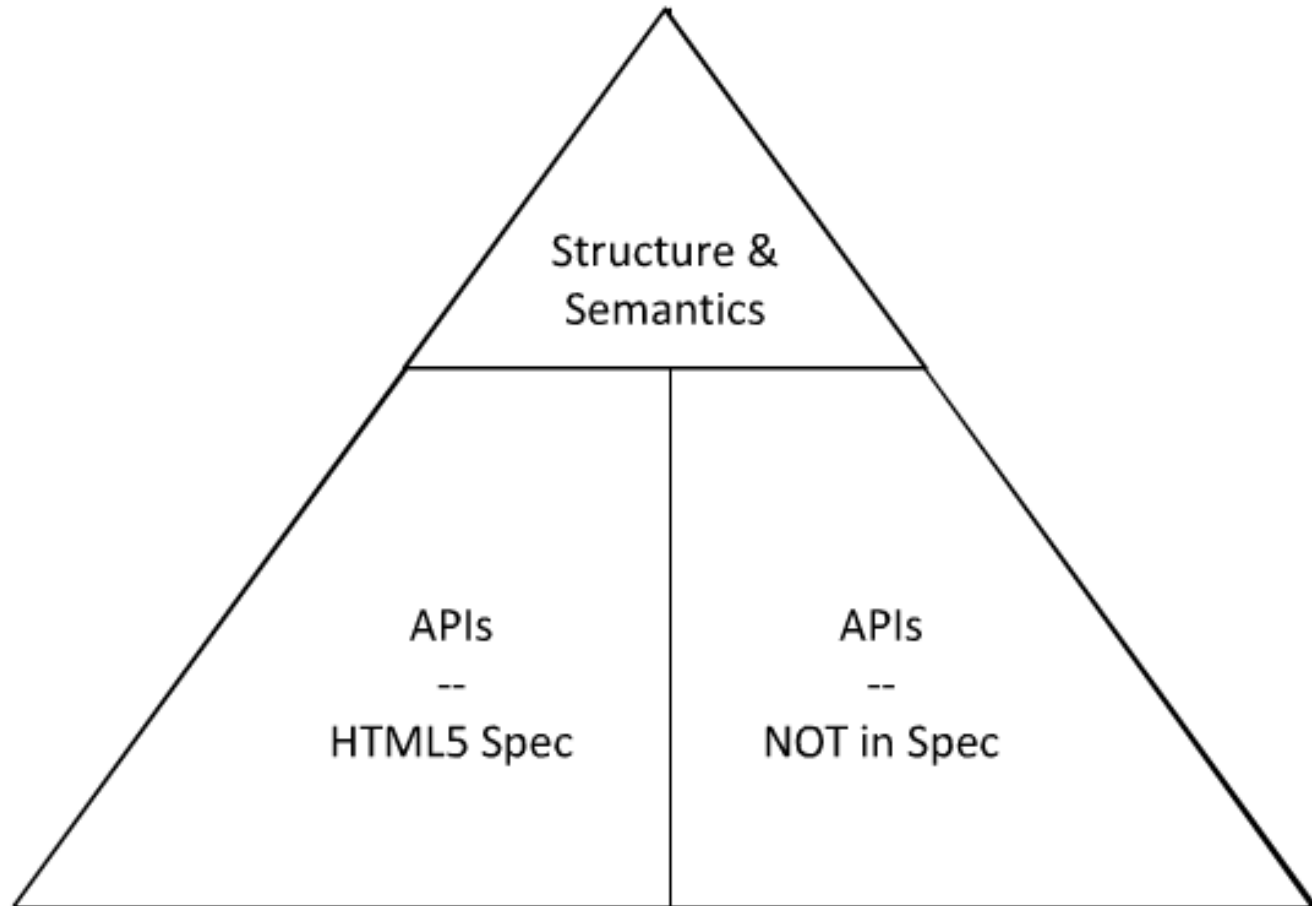
HTML5 overview

- Some topics
  (e.g. Local Storage,
  WebSocket, and
  Geolocation) were
  originally part of the HTML5 specification

- Moved to a separate standards document to keep the specification focused

- Industry still refers to the original set of features, including Web Sockets, as "HTML5"
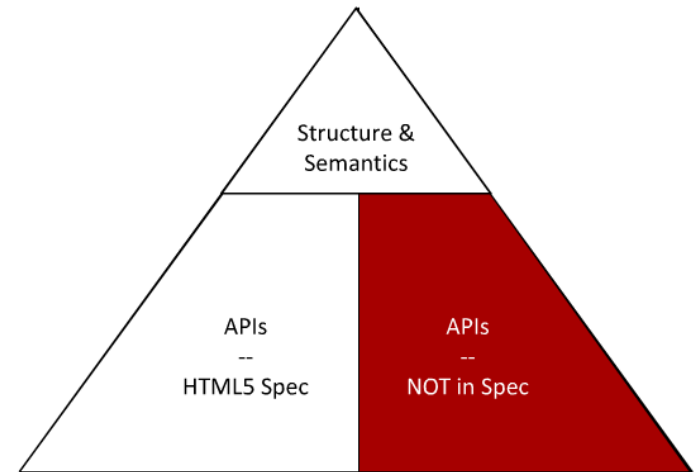
HTML5 structure & semantics

- Doctype
- Structural elements
- Web forms

Structure & Semantics

APIs
--
HTML5 Spec

APIs
--
NOT in Spec
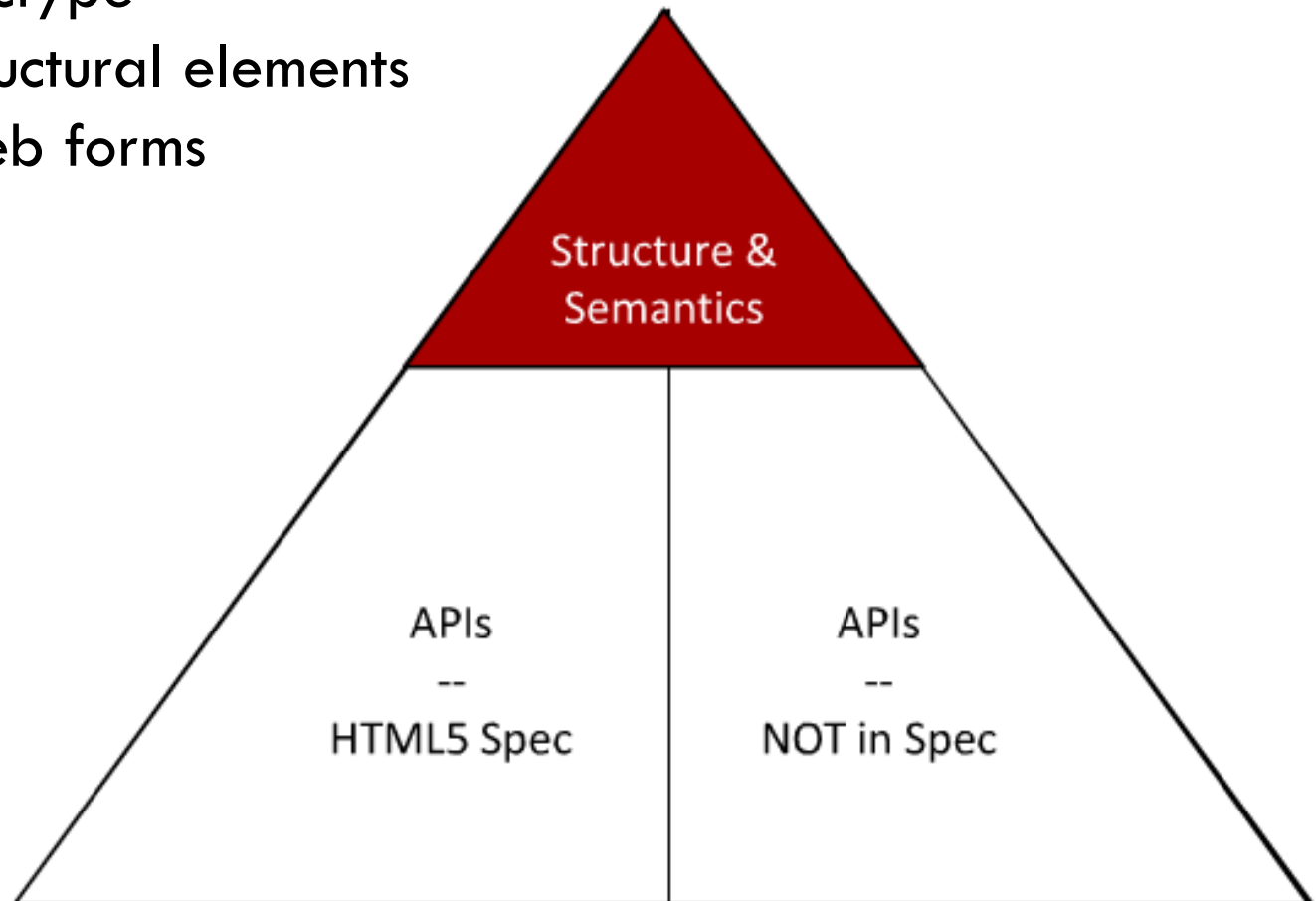
Doctype and less header code

```
<!DOCTYPE html PUBLIC "//W3C//DTD XHTML 1.0
Transitional//EN" "http://www.w3.org/1999/xhtml1-
transitional.dtd">
<html lang="en" xml:lang="en"
  xmlns="http://www.w3.org/1999/xhtml">
<head>
<meta http-equiv="Content-Type"
  content="text/html; charset="utf-8">
<title>Sample page</title>
<link rel="stylesheet" href="style-original.css"
  type="text/css" />
</head>
```

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="utf-8">
  <title>Sample page</title>
  <link rel="stylesheet" href="style-original.css" />
</head>
```

New tags in HTML5

- `<article>`
- `<aside>`
- `<audio>`
- `<canvas>`
- `<command>`
- `<datalist>`
- `<details>`
- `<dialog>`
- `<embed>`
- `<figure>`
- `<footer>`
- `<header>`
- `<hgroup>`
- `<keygen>`
- `<mark>`
- `<meter>`
- `<nav>`
- `<output>`
- `<ruby>`
- `<rt>`
- `<rp>`
- `<section>`
- `<source>`
- `<video>`
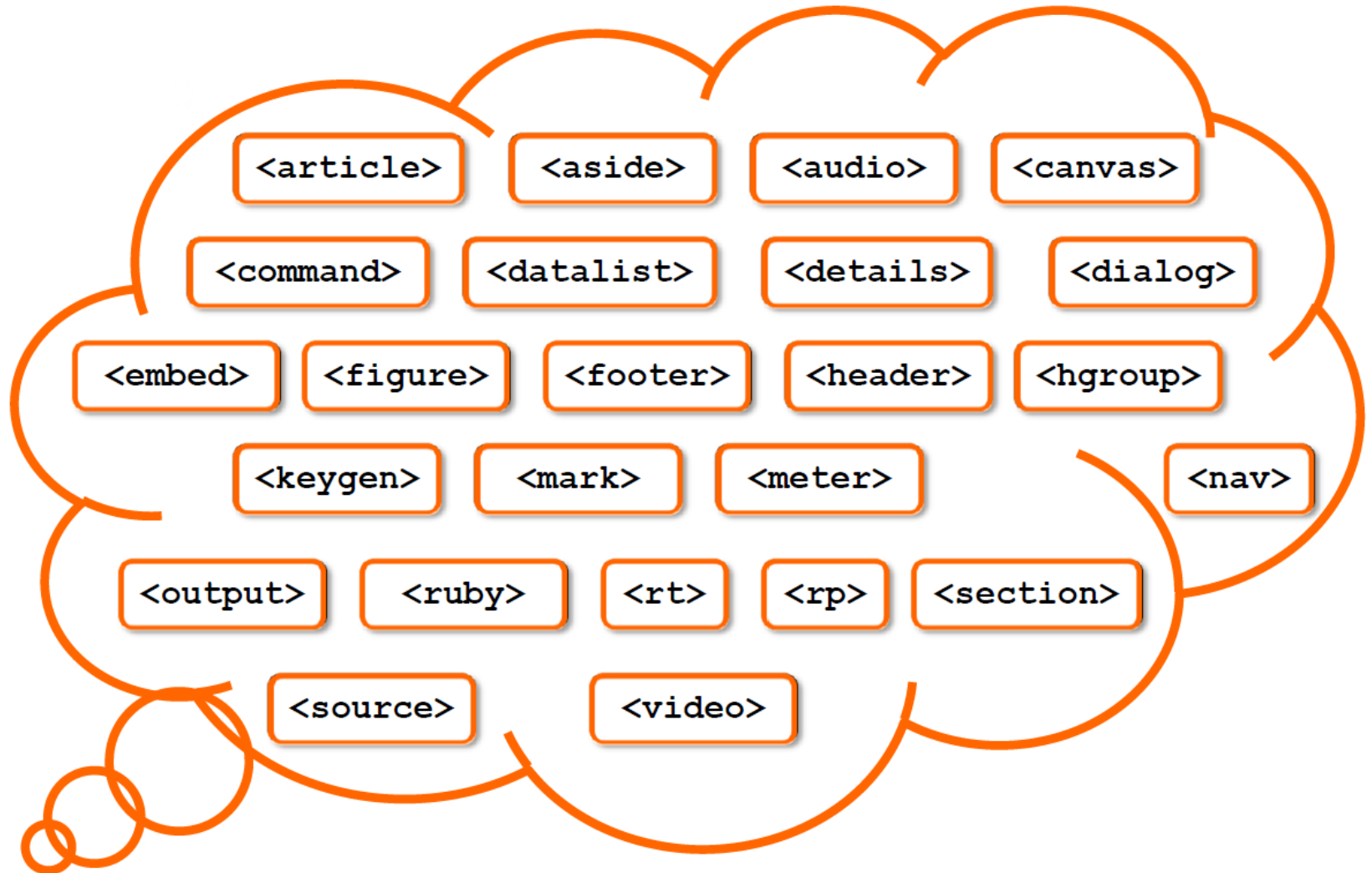
Removed tags in HTML5
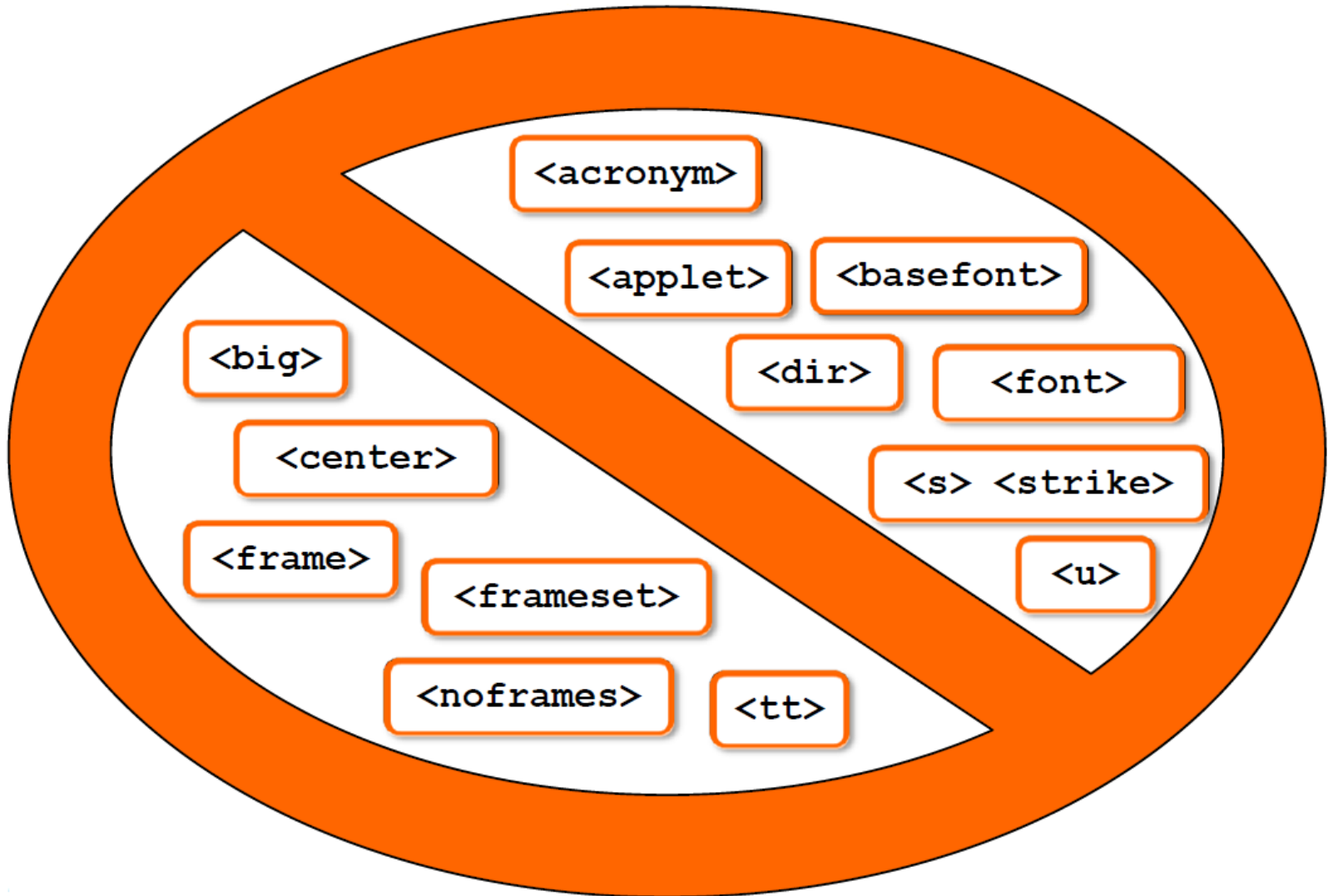
Structural elements

- Layout
  - `<header> <footer> <nav> <section> <article> <aside>`
- Inline
  - `<time> <details> <figure> <mark>`
- Interactive
  - `<audio> <video> <canvas>`

Layout: more semantic HTML tags

HTML 4

Layout: more semantic HTML tags

HTML 5
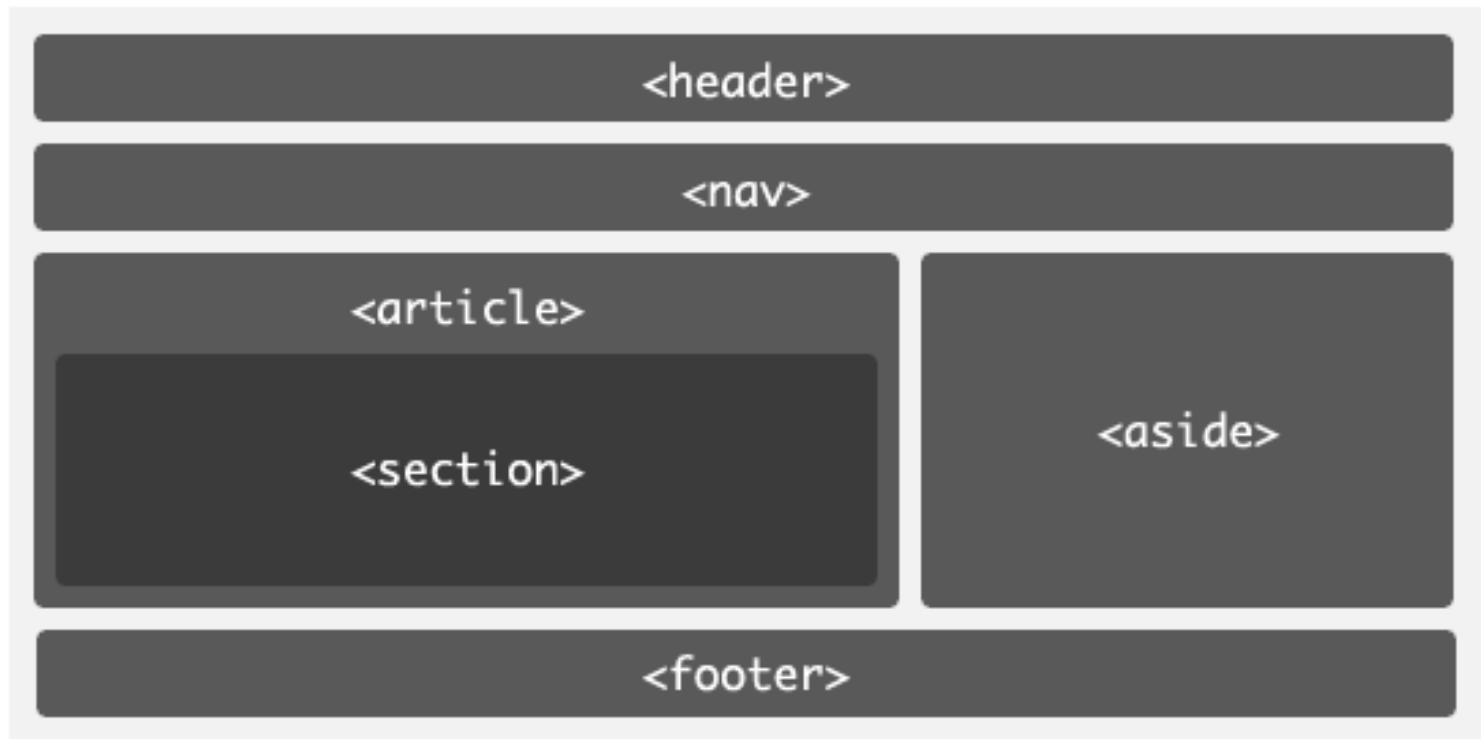
Structural elements

- `<header>`
  - A group of introductory or navigational aids
  - Usually intended to contain the section's heading (an h1–h6 element or an hgroup element), but this is not required
  - Can also be used to wrap a section's table of contents, a search form, or any relevant logos
- `<hgroup>`
  - Heading of a section: used to group a set of h1–h6 elements when the heading has multiple levels, such as subheadings, alternative titles, or taglines
- `<nav>`
  - Section of a page that links to other pages or to parts within the page: a section with navigation links
  - Only sections that consist of major navigation blocks are appropriate for the nav element

Structural elements

- `<article>`
  - A self-contained composition in a document, page, application, or site and that is intended to be independently distributable or reusable
  - E.g. : a forum post, a magazine or newspaper article, a blog entry, a user submitted comment, ...
- `<section>`
  - Generic section of a document or application
  - Thematic grouping of content, typically with a heading
- `<aside>`
  - A section of a page that consists of content that is tangentially related to the content around the aside element, and which could be considered separate from that content
  - Can be used for typographical effects like pull quotes or sidebars, for advertising, for groups of nav elements, and for other content that is considered separate from the main content of the page

Structural elements

- `<footer>`
  - A footer for its nearest ancestor sectioning content or sectioning root element
  - Typically contains information about its section such as who wrote it, links to related documents, copyright data, …
  - Do not necessarily have to appear at the end of a section, though they usually do
- `<address>`
  - The contact information for its nearest article or body element ancestor
  - Must not be used to represent arbitrary addresses (e.g. postal addresses), unless those are in fact the relevant contact information
  - Typically, it would be included along with other information in a footer element

HTML 5

file:///C:/Documents%20and%20Settings/Peter%20Lubbers/Desktop/html5/htm

Header

Subtitle

HTML5 Rocks!

Nav

Link 1 Link 2 Link 3 Link 4 Link 5

Article Header

Lorem ipsum dolor HTML5 nunc aut nunquam sit amet, consectetur adipiscing elit. Vivamus at est eros, vel fringilla urna.

Pellentesque odio diam, rhoncus nec congue in, Class aptent taciti sociosqu ad litora torquent per conubia nostra.

Per inceptos himenaeos. Quisque feugiat, justo at vehicula pellentesque, turpis lorem dictum nunc.

Article Footer

Article Header

Lorem ipsum dolor sit amet, HTML5 nunc aut nunquam consectetur adipiscing elit. Vivamus at est eros, vel fringilla urna.

Pellentesque odio diam, rhoncus nec congue in, pellentesque sed tortor.

Per inceptos himenaeos. Quisque feugiat, justo at vehicula pellentesque, turpis lorem dictum nunc.

Article Footer

Aside

HTML5: "Lorem ipsum dolor nunc aut nunquam sit amet, consectetur adipiscing elit. Vivamus at est eros, vel fringilla urna. Pellentesque odio diam, rhoncus nec congue in, pellentesque sed tortor. Class aptent taciti sociosqu ad litora torquent per conubia nostra, per inceptos himenaeos. Quisque feugiat, justo at vehicula pellentesque, turpis lorem dictum nunc."

Footer

#5 No CSS

52

Figure and figure caption

```
<figure>
  <img src="bubbles-work.jpeg"
    alt="Bubbles, sitting in his office chair, works
    on his latest project intently.">
  <figcaption>Bubbles at work</figcaption>
</figure>
```

```
<!DOCTYPE html>
<html>
<p>In <a href="#l4">listing 4</a> we see the primary
core interface API declaration.</p>
<figure id="l4">
<figcaption>Listing 4. The primary core interface
API declaration.</figcaption>
<pre><code>interface PrimaryCore {
boolean verifyDataLine();
void sendData(in sequence&lt;byte> data);
void initSelfDestruct();
}</code></pre>
</figure>
</html>
```

Time and publishdate attribute

- `<time datetime pubdate>`
  - Represents either a time on a 24 hour clock, or a precise date in the Gregorian calendar, optionally with a time and a timezone offset
  - The datetime attribute, if present, gives the date or time being specified. Otherwise, the date or time is given by the element's contents
  - The pubdate attribute is a boolean attribute. If specified, it indicates that the date and time given by the element is the publication date and time of the nearest ancestor article element, or, if the element has no ancestor article element, of the document as a whole

```
<time pubdate datetime="2009-10-09T14:28-08:00"></time>
```

Summary: new markup elements

Tag	Description
<article>	For external content, like text from a news-article, blog, forum, or any other content from an external source
<aside>	For content aside from the content it is placed in. The aside content should be related to the surrounding content
<command>	A button, or a radiobutton, or a checkbox
<details>	For describing details about a document, or parts of a document
<summary>	A caption, or summary, inside the details element
<figure>	For grouping a section of stand-alone content, could be a video
<figcaption>	The caption of the figure section
<footer>	For a footer of a document or section, could include the name of the author, the date of the document, contact information, or copyright information
<header>	For an introduction of a document or section, could include navigation
<hgroup>	For a section of headings, using <h1> to <h6>, where the largest is the main heading of the section, and the others are sub-headings
<mark>	For text that should be highlighted

Summary: new markup elements

Tag	Description
<meter>	For a measurement, used only if the maximum and minimum values are known
<nav>	For a section of navigation
<progress>	The state of a work in progress
<ruby>	For ruby annotation (Chinese notes or characters)
<rt>	For explanation of the ruby annotation
<rp>	What to show browsers that do not support the ruby element
<section>	For a section in a document. Such as chapters, headers, footers, or any other sections of the document
<time>	For defining a time or a date, or both
<wbr>	Word break. For defining a line-break opportunity.

Ruby annotations

- Short runs of text alongside the base text, typically used
  in East Asian documents to indicate pronunciation or to provide a short annotation
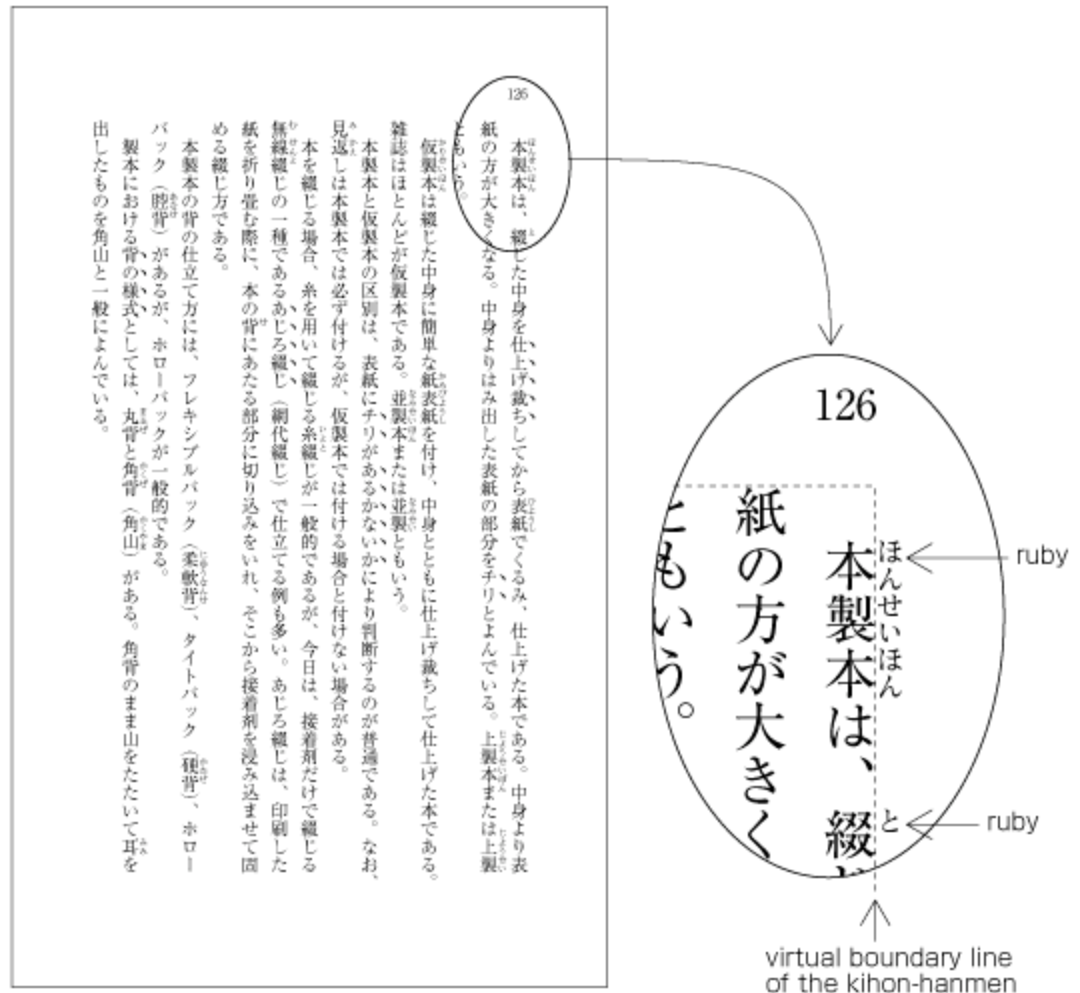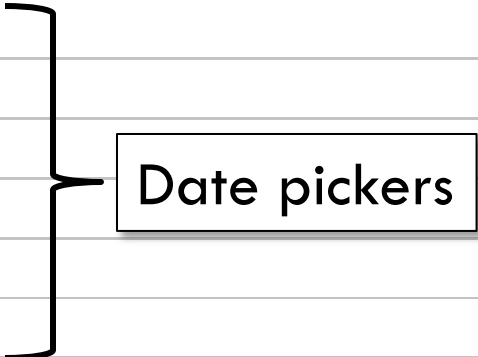
HTML5 forms

- Formerly called Web Forms 2.0
- Native functionality (no scripting for validation)
  - Means less coding
- New form functionalities
  - Date and color pickers
  - Search, e-mail, web address input types
  - Validation
  - Spin boxes and sliders
- Backward compatible
  - Features degrade gracefully (unknown input types are treated as text-type) input

HTML5 forms

- New input types

Type	Description
tel	The input value is of type telephone number
search	The input field is a search field
url	The input value is a URL
email	The input value is one or more email addresses
datetime	The input value is a date and/or time
date	The input value is a date
month	The input value is a month
week	The input value is a week
time	The input value is of type time
datetime-local	The input value is a local date/time
number	The input value is a number
range	The input value is a number in a given range
color	The input value is a hexadecimal color, like #FF8800

Date pickers

- New elements
- New attributes

New input types

- Allow for better input control and validation
- If not supported, they will behave as regular text fields

http://wufoo.com/html5/

Browser Support for New HTML5 Input Types

		Firefox	Safari	Safari	Chrome	Opera	IE	Android
Email	?	4+	5+	3.1+	6+/10+	10.6+	10+	4+
Tel	?	4+	5+	3.1+	6+	10.6+	10+	2.3+
Url	?	4+	5+	3.1+	6+/10+	10.6+	10+	2.3+
Search	?	4+	5+	4+	6+	10.6+	9/10+	4+
Color	?	29+	8+	8−	20+	11+	11−	4.4+
Number	?	29+	5+	3.2+	7+	9+	10+	2.3+
Range	?	23+	4+	5+	6+	11+	10+	4.2+
Date	?	32−	7−	5+	20+	9+	11−	4.4+
Text	?	All	All	All	All	All	All	All

email input type

E-mail: laura

Invia

Si prega di inserire un indirizzo email valido

```
<!DOCTYPE HTML>
<html>
<body>

  <form action="demo_form.asp" method="get">
    E-mail: <input type="email" name="user_email" /><br />
    <input type="submit" />
  </form>

</body>
</html>
```

- The value of the email field is automatically validated when the form is submitted

url input type

Homepage: http://lauraS

Invia

Si prega di inserire un indirizzo web valido

```
<!DOCTYPE HTML>
<html>
<body>

<form action="demo_form.asp" method="get">
  Homepage: <input type="url" name="user_url" /> <br />
  <input type="submit" />
</form>

</body>
</html>
```

- The value of the url field is automatically validated when the form is submitted

number input type

- Restrictions on which numbers are accepted

```
<!DOCTYPE HTML>
<html>
<body>

  <form action="demo_form.asp" method="get">
    Points: <input type="number" name="points" min="1"
     max="10" />
    <input type="submit" />
  </form>

</body>
</html>
```

Points: [7][▲▼] [Invia]

Restrictions on type number

Attribute	Value	Description
max	*number*	Specifies the maximum value allowed
min	*number*	Specifies the minimum value allowed
step	*number*	Specifies legal number intervals (if step="3", legal numbers could be -3,0,3,6, etc)
value	*number*	Specifies the default value

```html
<!DOCTYPE HTML>
<!DOCTYPE HTML>
<html>
<body>
  <form action="demo_form.asp" method="get">
    <input type="number" name="points" min="0" max="10"
      step="3" value="6" />
    <input type="submit" />
  </form>
</body>
</html>
```

range input type

```
<!DOCTYPE HTML>
<html>
<body>

  <form action="demo_form.asp" method="get">
    Points: <input type="range" name="points"
      min="1" max="10" />
    <input type="submit" />
  </form>

</body>
</html>
```

Points: [========|========] Invia

Opera   **Firefox**

Input was received as: Points: [_____] Invia richiesta

points=7

Input type - date pickers

- New input types for selecting date and time
  - date - selects date, month and year
  - month - selects month and year
  - week - selects week and year
  - time - selects time (hour and minute)
  - datetime - selects time, date, month and year (UTC time)
  - datetime-local - selects time, date, month and year (local time)

Date pickers

```
<!DOCTYPE HTML>
<html>
<body>

  <form action="demo_form.asp" method="get">
    Date: <input type="date" name="user_date" />
    <input type="submit" />
  </form>

</body>
</html>
```
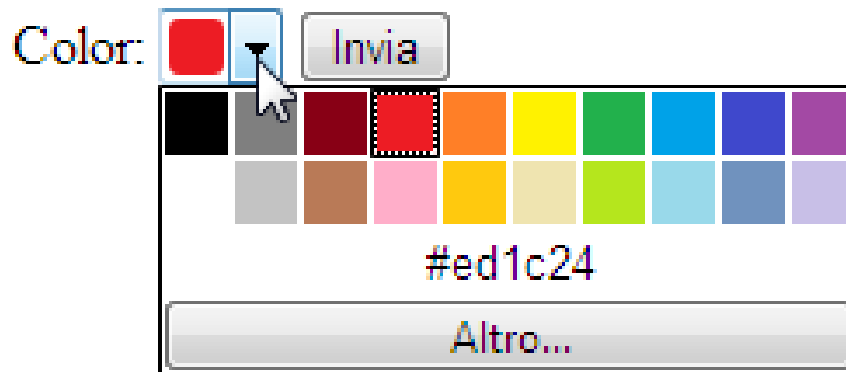
color input type

```
<!DOCTYPE HTML>
<html>
<body>

  <form action="demo_form.asp" method="get">
    Color: <input type="color" name="user_color" />
    <input type="submit" />
  </form>

</body>
</html>
```

Color: Invia

#ed1c24

Altro...

New form elements

Tag	Description
<datalist>	A list of options for input values
<keygen>	Generate keys to authenticate users
<output>	For different types of output, such as output written by a script

datalist element

- Specifies a list of options for an input field
  - To bind a datalist to an input field, the list attribute of the input field refers to the id of the datalist

```
<!DOCTYPE HTML>
<html>
<body>
  <form action="demo_form.asp" method="get">
    Webpage: <input type="url" list="url_list" name="link" />
    <datalist id="url_list">
      <option label="W3Schools"
        value="http://www.w3schools.com" />
      <option label="Google" value="http://www.google.com" />
      <option label="Microsoft"
        value="http://www.microsoft.com" />
    </datalist>
    <input type="submit" />
  </form>
</body>
</html>
```

Webpage: http://www.w3schools.com   Invia

http://www.w3schools.com	W3Schools
http://www.google.com	Google
http://www.microsoft.com	Microsoft

keygen element

- Purpose: to provide a secure way to authenticate users
- It is a key-pair generator
  - When a form is submitted, two keys are generated, one private and one public
- The private key is stored on the client, and the public key is sent to the server
- The public key could be used to generate a client certificate to authenticate the user in the future
- Currently, the browser support for this element is not good enough to be a useful security standard

keygen element

```
<!DOCTYPE HTML>
<html>
<body>

  <form action="demo_keygen.asp" method="get">
    Username: <input type="text" name="usr_name" />
    Encryption: <keygen name="security" />
    <input type="submit" />
  </form>

</body>
</html>
```
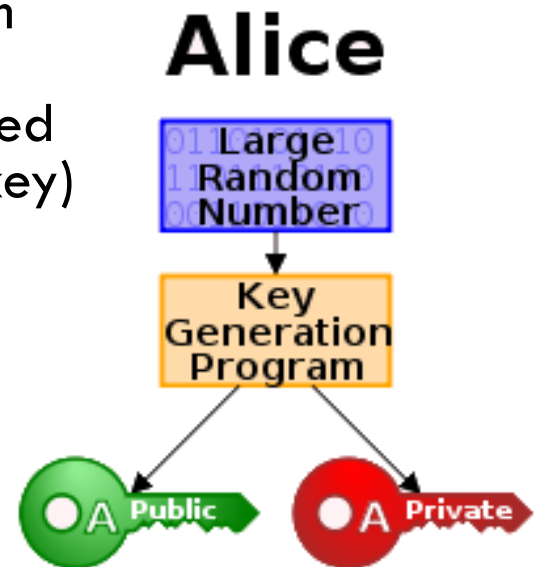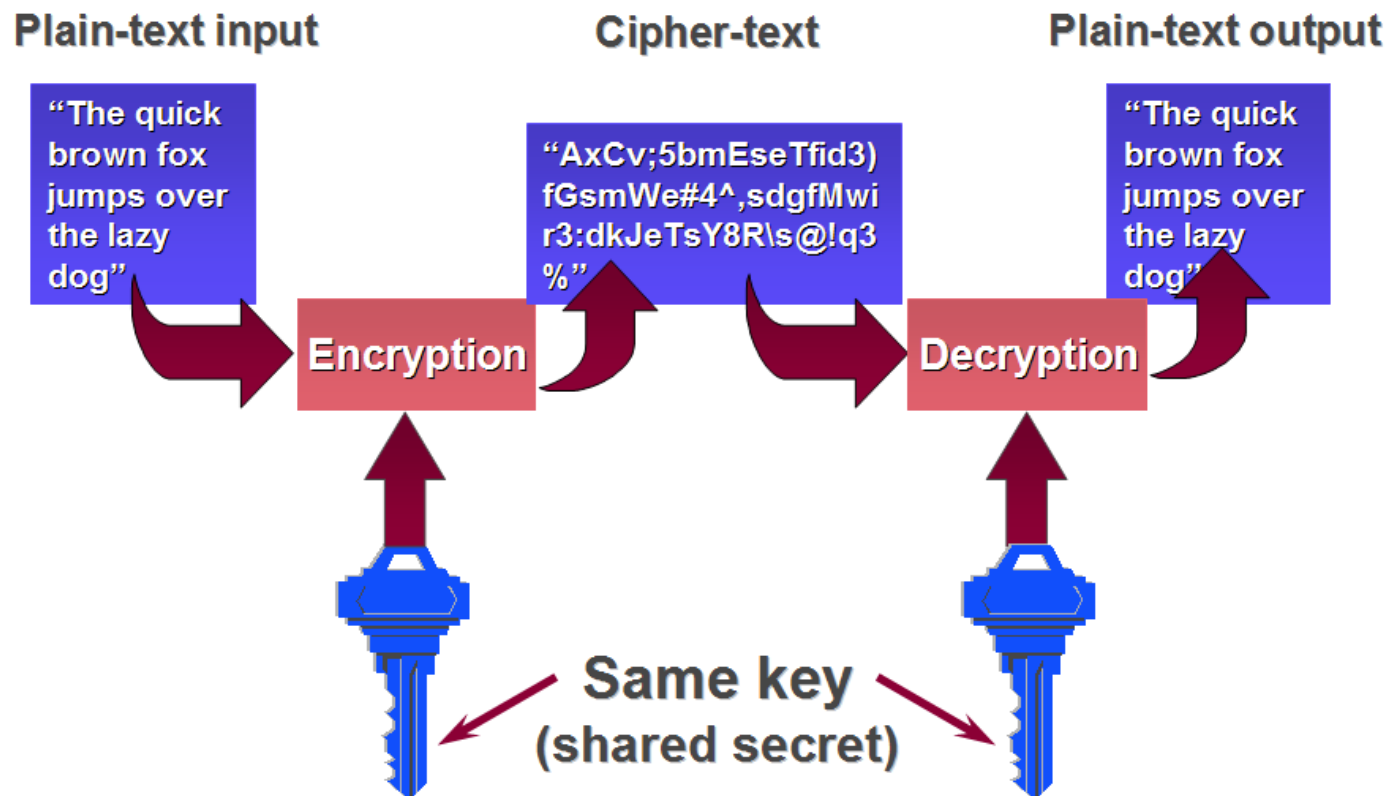
Public-key cryptography

- Widely used set of methods for transforming a written message into a form that can be read only by the intended recipient

- This cryptographic approach involves the use of asymmetric key algorithms
  - ◦ The non-message information (the public key) needed to transform the message to a secure form is different from the information needed to reverse the process (the private key)

- An unpredictable (typically large and random) number is used to begin generation of an acceptable pair of keys suitable for use by an asymmetric key algorithm

Symmetric-key algorithm

- Use trivially related, often identical, cryptographic keys for both decryption and encryption

Plain-text input

"The quick brown fox jumps over the lazy dog"

Cipher-text

"AxCv;5bmEseTfid3)fGsmWe#4^,sdgfMwir3:dkJeTsY8R\s@!q3%"

Plain-text output

"The quick brown fox jumps over the lazy dog"

Encryption

Decryption

Same key (shared secret)

Public-key cryptography

- In an asymmetric key encryption scheme, anyone can encrypt messages using the public key, but only the holder of the paired private key can decrypt

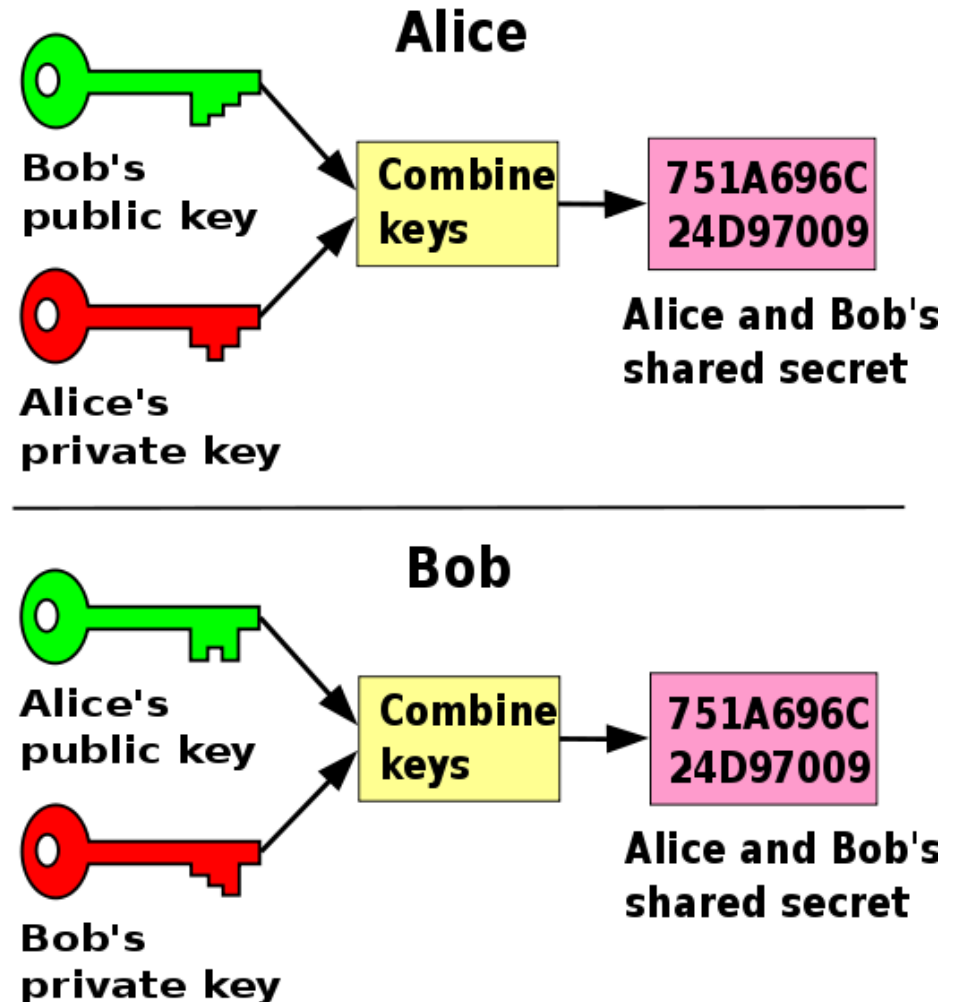- Security depends on the secrecy of that private key
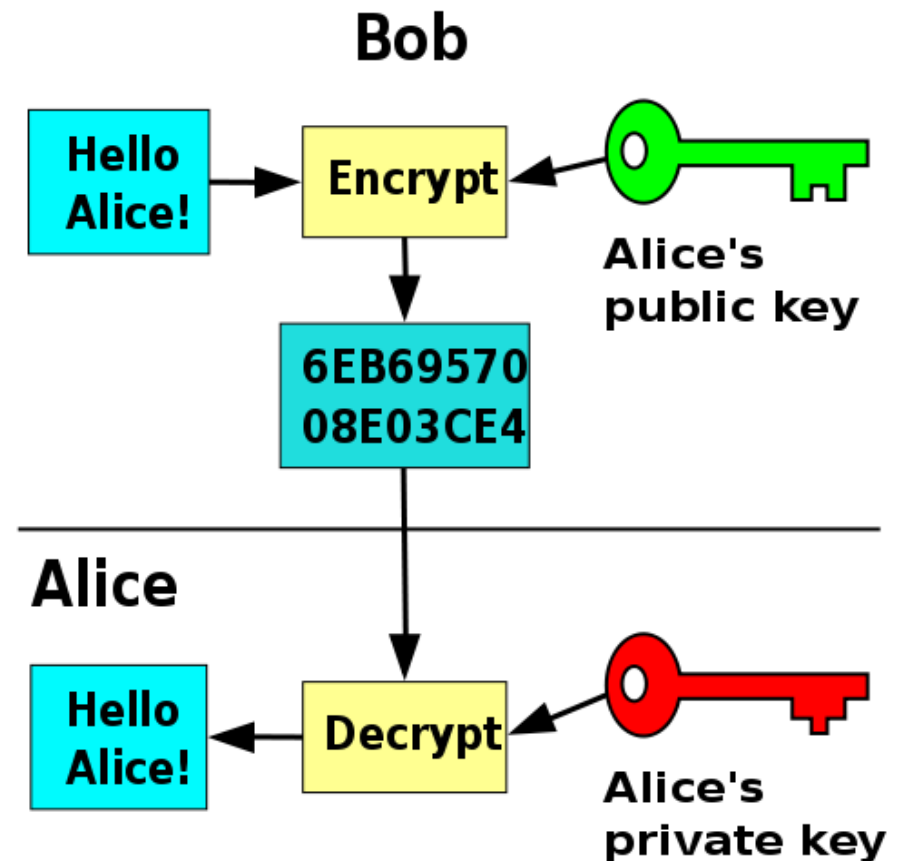
Public-key cryptography

- In some related signature schemes, the private key is used to sign a message
- Anyone can check the signature using the public key
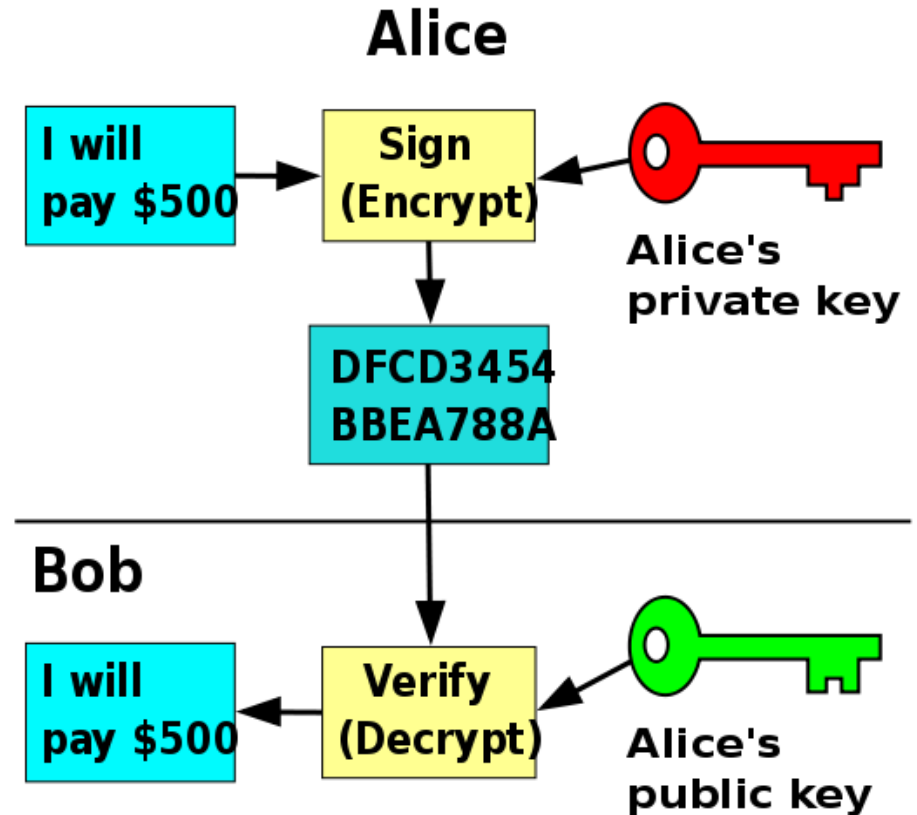
Public-key cryptography

- After obtaining an authentic copy of each other's public keys, Alice and Bob can compute a shared secret offline

- The shared secret can be used as the key for a symmetric cipher

Alice

Bob's public key

Alice's private key

Combine keys

751A696C 24D97009

Alice and Bob's shared secret

Bob

Alice's public key

Bob's private key

Combine keys

751A696C 24D97009

Alice and Bob's shared secret

output element

- Used for different types of output, like calculations or script output

Simple calculator using the output element:

```
25            +  56            = 81
```

```html
<!DOCTYPE HTML>
<html><head>
<script type="text/javascript">
  function resCalc()
  { numA=document.getElementById("num_a").value;
    numB=document.getElementById("num_b").value;
    document.getElementById("result").value=Number(numA)+
      Number(numB);  }
</script>
</head>
<body>
<p>Simple calculator using the output element:</p>
<form onsubmit="return false">
  <input id="num_a" /> +
  <input id="num_b" /> =
  <output id="result" onforminput="resCalc()"></output>
</form>
</body></html>
```

New form attributes

Browser Support for New HTML5 Input Attributes

		Firefox	Safari	Safari	Chrome	Opera	IE	Android
Placeholder	?	4+	4+	4+	10+	11.10+	10+	2.3+
Autofocus	?	4+	5+	5−	6+	11+	10+	3+
Maxlength	?	4.4+	5+	4+	6+	11+	9/10	2.3+
List (Datalist)	?	4+	7−	7−	20+	9+	10+	4.3−
Autocomplete	?	4+	5.2+	6+	14+	10.6+	11+	4.4+
Required	?	6+	5+	4+	6+	10.6+	10+	2.3+
Pattern	?	4+	5+	4+	10+	11+	10+	2.3+
Spellcheck	?	3.6+	4+	7+	10+	11+	10+	4.3−

… more

http://wufoo.com/html5/

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New form attributes

- **autocomplete attribute**

First name: Laura

Last name: F

E-mail: Farinetti

Invia richiesta

```
<!DOCTYPE HTML>
<html>
<body>
  <form action="demo_form.asp" method="get" autocomplete="on">
    First name:<input type="text" name="fname" /><br />
    Last name: <input type="text" name="lname" /><br />
    E-mail: <input type="email" name="email"
      autocomplete="off" /><br />
    <input type="submit" />
  </form>
  <p>Fill in and submit the form, then reload the page to see
    how autocomplete works.</p>
  <p>Notice that autocomplete is "on" for the form, but "off"
    for the e-mail field.</p>
</body>
</html>
```

New form attributes

- autofocus attribute
  - specifies that a field should automatically get focus when a page is loaded

User name: [   ] [Invia]

```
<!DOCTYPE HTML>
<html>
<body>
<form action="demo_form.asp" method="get">
  User name: <input type="text" name="user_name"
    autofocus="autofocus" />
  <input type="submit" />
</form>
</body>
</html>
```

New form attributes

- form attribute
  - specifies one or more forms the input field belongs to

First name: [   ] [Invia]

The input field below is outside the form element, but still part of the form.

Last name: [   ]

```
<!DOCTYPE HTML>
<html>
<body>
  <form action="demo_form.asp" method="get" id="user_form">
    First name:<input type="text" name="fname" />
    <input type="submit" />
  </form>
  <p>The input field below is outside the form element, but
    still part of the form.</p>
  Last name: <input type="text" name="lname" form="user_form" />
</body>
</html>
```

New form attributes

- **multiple attribute**
  - specifies that multiple values can be selected for an input field form attribute

Select images: |0-11\MatDid\01-Xml.pdf"   [Aggiungi file]   [Invia]

Try selecting more than one file when browsing for files.

Input was received as:

img=00-Presentazione.pdf&img=00-Presentazione.pdf&img=01-Xml.pdf

```
<!DOCTYPE HTML>
<html>
<body>
  <form action="demo_form.asp" method="get">
    Select images: <input type="file" name="img"
     multiple="multiple" />
    <input type="submit" />
  </form>
  <p>Try selecting more than one file when browsing for files.</p>
</body>
</html>
```

New form attributes

- required attribute
  - specifies that an input field must be filled out before submitting

Name: [   ] [Invia]

Questo campo è obbligatorio

```
<!DOCTYPE HTML>
<html>
<body>
  <form action="demo_form.asp" method="get">
    Name: <input type="text" name="usr_name"
      required="required" />
    <input type="submit" />
  </form>
</body>
</html>
```

New form attributes

- pattern attribute
  - specifies a pattern used to validate an input field
  - a pattern is a regular expression

Country code: [it]   [Invia]

Si prega di utilizzare il formato richiesto
Three letters country code

```
<!DOCTYPE HTML>
<html>
<body>
  <form action="demo_form.asp" method="get">
    Country code: <input type="text" name="country_code"
      pattern="[A-z]{3}" title="Three letter country code" />
    <input type="submit" />
  </form>
</body>
</html>
```

Licenza d'uso