

Hypertext & hypermedia

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Hypertext

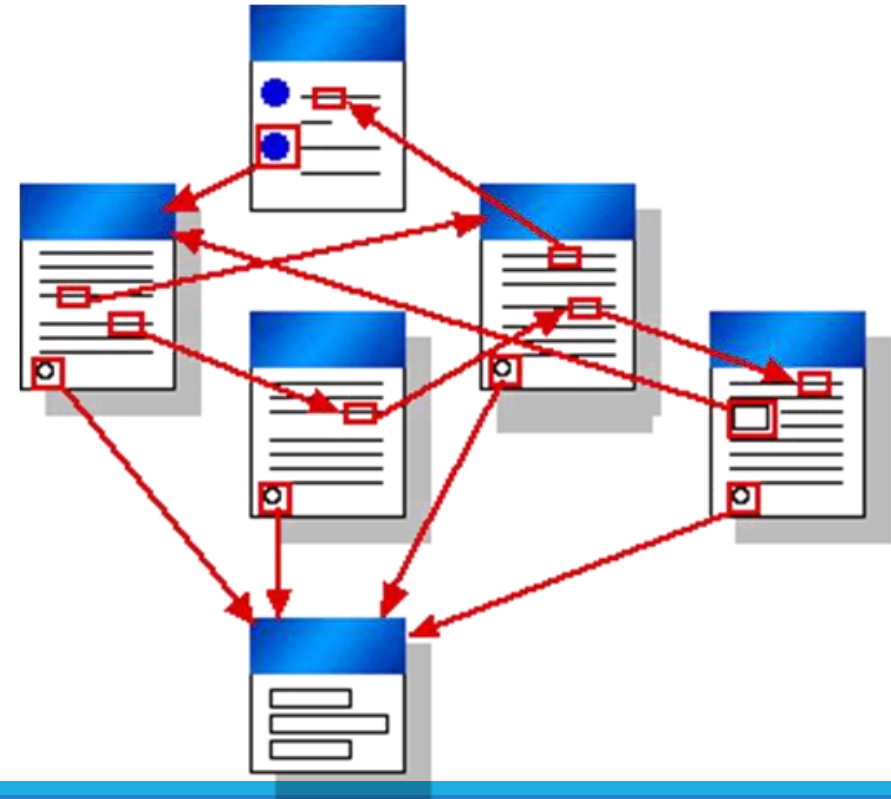
Hypertext - a database that has active cross-references and allows the reader to 'jump' to other parts of the database as desired

Schneiderman, 1989

Nodes – units of information

Links – labels connecting nodes

Navigation – process of moving through the hypertext database



Creating web pages



HTML
contents



CSS
presentation



JavaScript
action

Nel corso non vedremo javascript



HTML

HyperText

- used to write content on the hypertext system (web)

Markup

- the document is built on tags

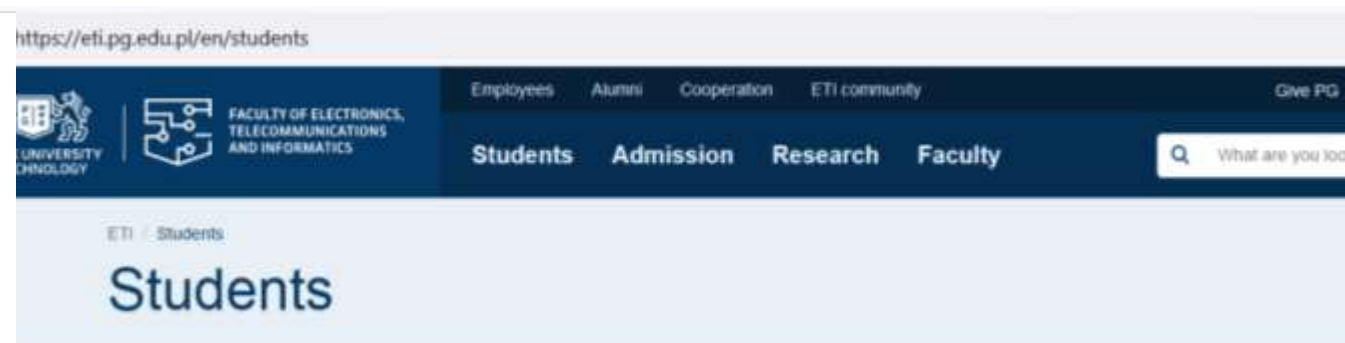
Language

- the document is built according to syntax rules, and based on a defined alphabet - tags

```

5 <main id="content">
6   <div>
7     <div data-drupal-messages-fallback class="hidden"></div>
8 <div id="block-politechnika-gdanska-content" class="block block-system block-system-
9 main-block">
10
11     <article role="article" about="https://eti.pg.edu.pl/en/students">
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```



The classes at the Faculty of Electronics, Telecommunication and Informatics of Gdańsk University of Technology in the winter semester 2021/2022 start on the 1st October 2021 and will be conducted as follows:

Hybrid mode – Undergraduate (BA) and Postgraduate (MA) full-time

Students

News

Registrar's Office

Diploma Thesis

Freshman

Erasmus +

Moja PG Portal

Useful links

Student Affairs Office

ECTS Information Package

HTML

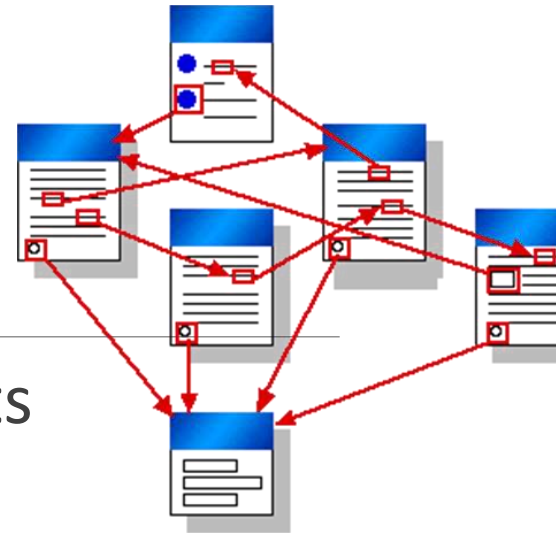
language describing the structure of web pages documents

- content + formatting (graphic layout)
- text, multimedia, hyperlinks

language defining documents

- set of tags
- describe the look of the website
- tags - formatting instructions
- each tag describe different content of the document

a fixed set of tags



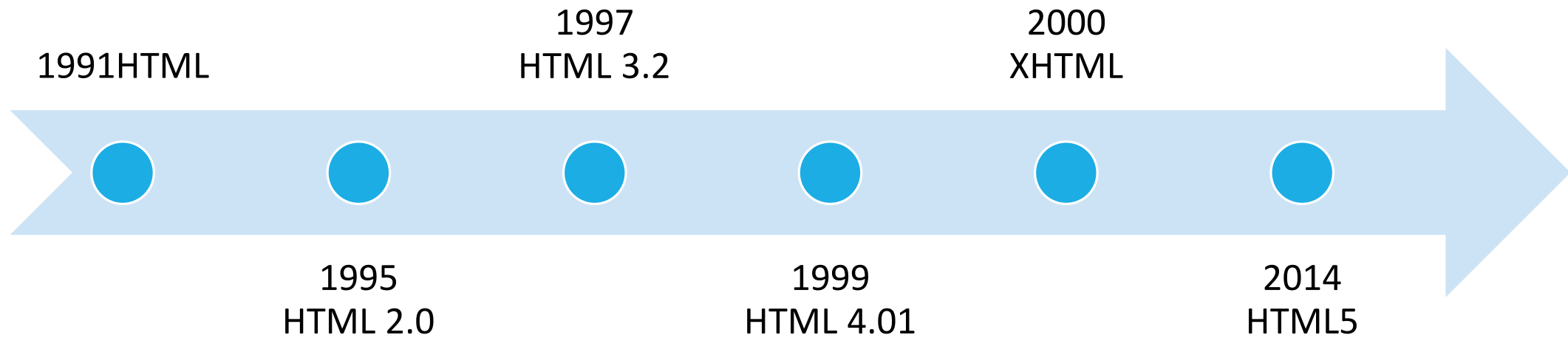
History of HTML

HTML vs XHTML

different writing style

some restrictions

the same tags



HTML - advantages and disadvantages



- widely used, every browser supports HTML
- simply syntax
- easy to learn and use
- you can integrate HTML with CSS, JavaScript, php etc.



- content and presentation
- no information about logical structure of document, it's a language for presentation of the content
- is not extensible, fixed set of tags

Non c'è separazione fra contenuto e forma

Tags, elements

keywords, tags do have a specific meaning

- `<tag>` `<html>` `<p>` `<nav>` `<div>` `<h1>`

tags normally come in pairs:
start tag (opening tag) and
end tag (closing tag)

- `<tag>` content `</tag>`

empty element

- `<tag/>`
- `<tag></tag>`

Attributes

specificano particolari caratteristiche per un elemento

elements can have attributes

attributes provide additional information about an element

attributes are always specified in the start tag

- ``

- `<tag attrName="value"> content </tag>`
- `<tag attrName="value"/>`

HTML document structure (basic)

```
<!DOCTYPE html>
```

```
<html >
```

```
<head>
```

tags that describe the content of the document

```
</head>
```

```
<body>
```

tags that create the content of the document

```
</body>
```

```
</html>
```

Spesso ci può essere il
percorso dov'è il file CSS

HTML document structure (basic)

<!doctype html>

- a declaration, lets the browser know that you are using HTML5

Serve per far capire al browser che è un file html

```
<!DOCTYPE html>
<html >
  <head>
    tags that describe the content of the document
  </head>
  <body>
    tags that create the content of the document
  </body>
</html>
```

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
```

HTML document structure (basic)

```
<!DOCTYPE html>
```

```
<html >
```

```
<head>
```

tags that describe the content of the document

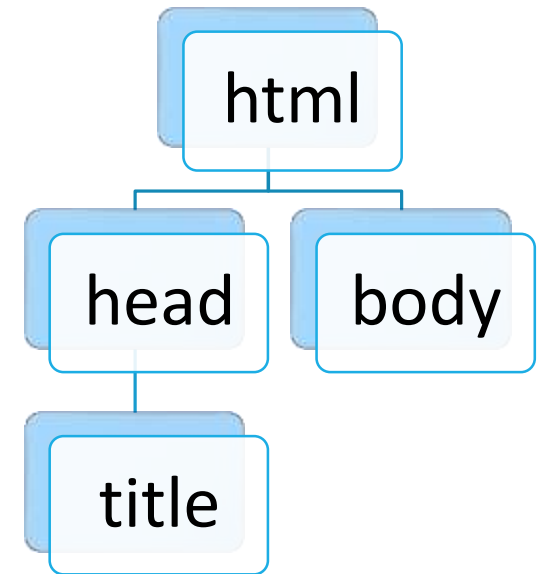
```
</head>
```

```
<body>
```

tags that create the content of the document

```
</body>
```

```
</html>
```



<head>

<head>

```
<meta charset="utf-8">  
<title>Document Title</title>  
<link rel="stylesheet" href="style.css">  
<script src="script.js"></script>
```

</head>

<title>

- defines a title for the document

<script>

- define a client-side script (JavaScript); functions to handle events

<style>

- style of presentation

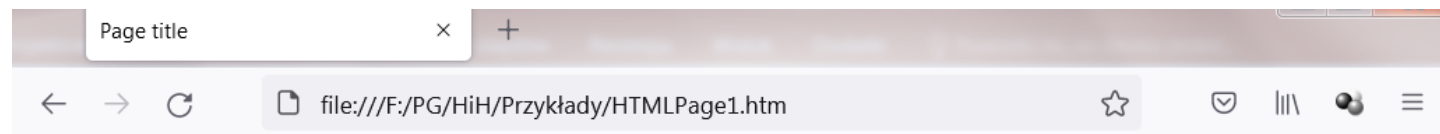
Magari il file CSS

<meta>

- metadata about the HTML, information for browsers

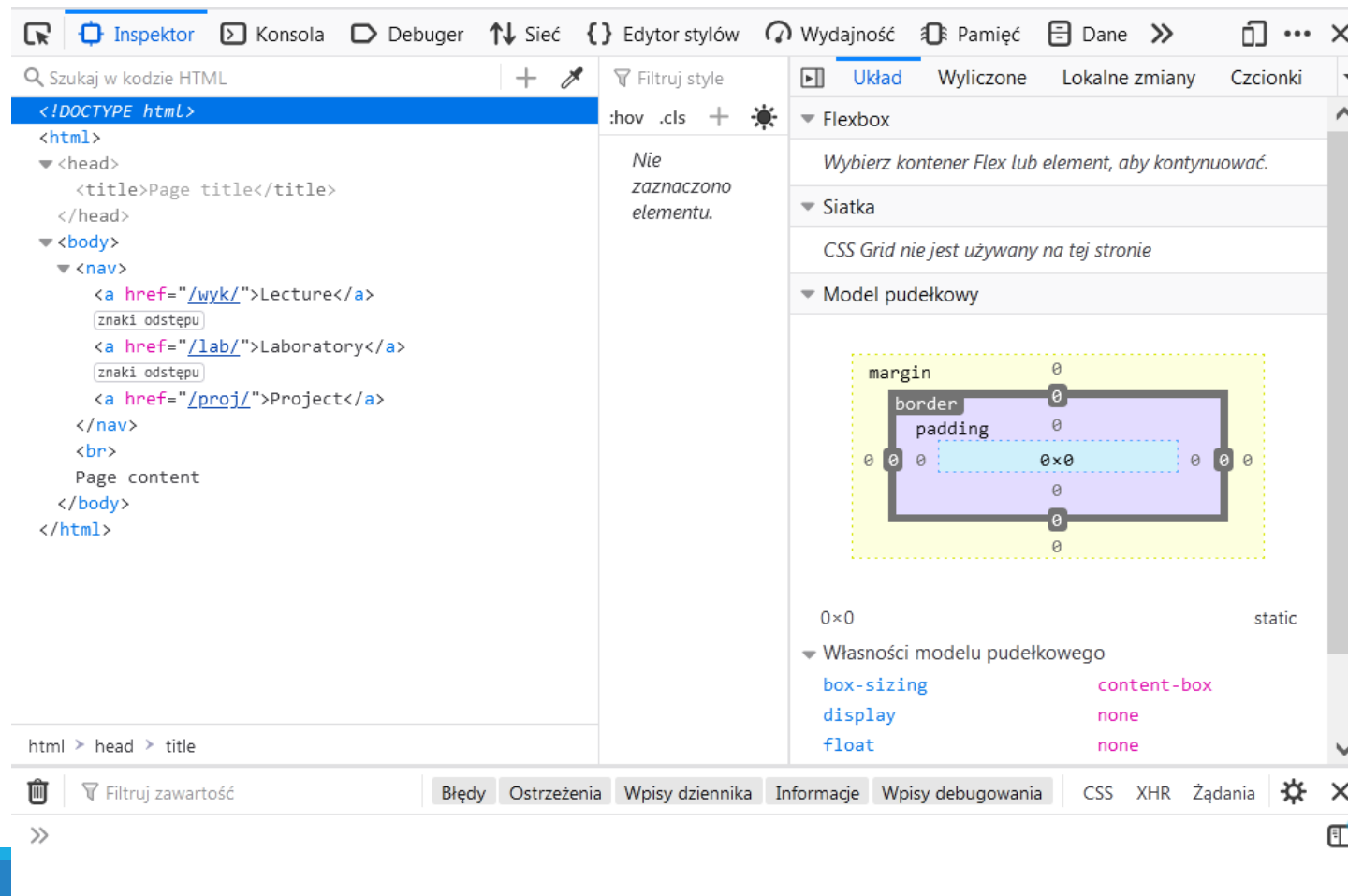
<link>

- defines the relationship between a document and an external resource



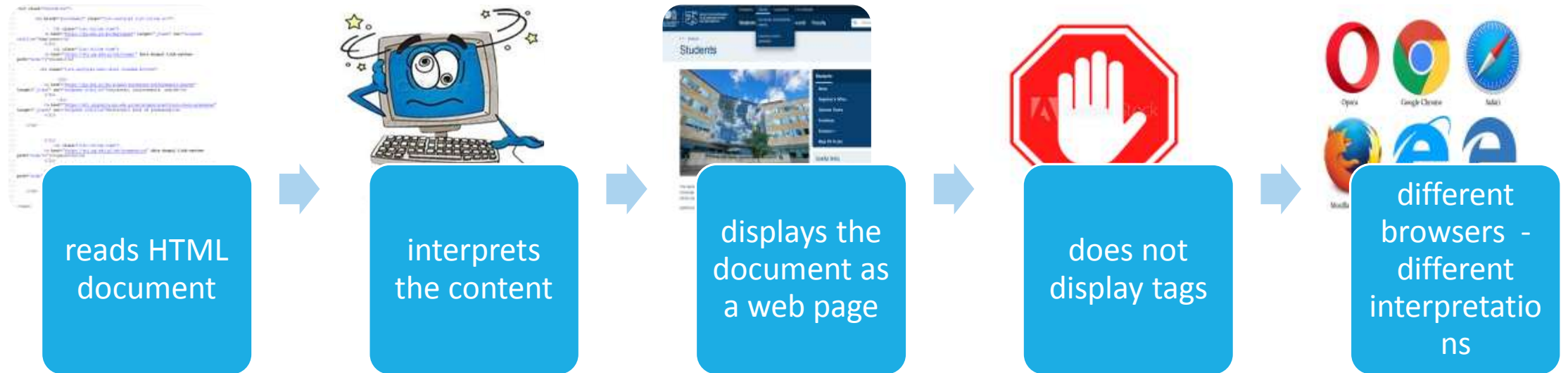
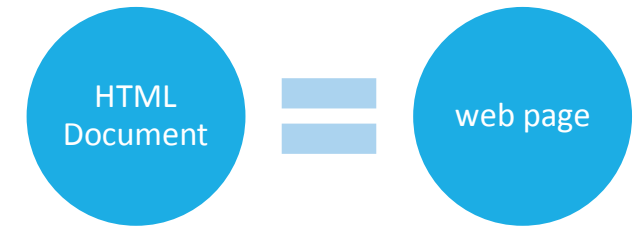
[Lecture Laboratory Project](#)

Page content



HTML in browsers

What does the browser do?

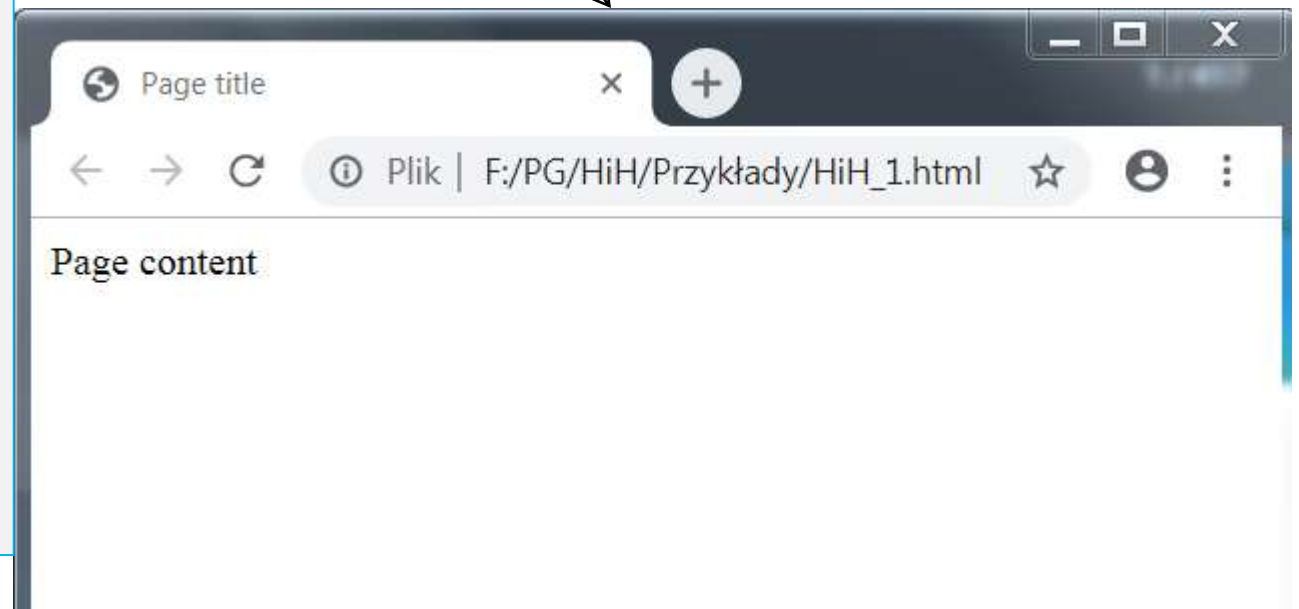


HTML in browsers

Per scoprire tutti i tag, arraggiati e cerca le reference su internet

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

index.html



Validation

Per controllare se il codice HTML è corretto

The screenshot shows the W3C Markup Validation Service interface in a web browser. The browser's address bar shows the URL `http://validator.w3.org/check`. The page has a blue header with the W3C logo and the text "Markup Validation Service" and "Check the markup (HTML, XHTML, ...) of Web documents". Below the header, there are links for "Jump To: Congratulations · Icons". A green banner states "This document was successfully checked as HTML 4.01 Transitional!". Below this, a table displays the validation details.

Result:	Passed	
File :	<input type="text"/> <input type="button" value="Przeglądaj..."/> <small>Use the file selection box above if you wish to re-validate the uploaded file <code>ankieta.htm</code></small>	
Encoding :	iso-8859-2	(detect automatically) ▼
Doctype :	HTML 4.01 Transitional	(detect automatically) ▼
Root Element:	HTML	

HTML tags – text formatting

heading commands

- `<h1>`, `<h2>`, ..., `<h6>`

paragraph

- `<p>Paragraph content</p>`

span

- `text`

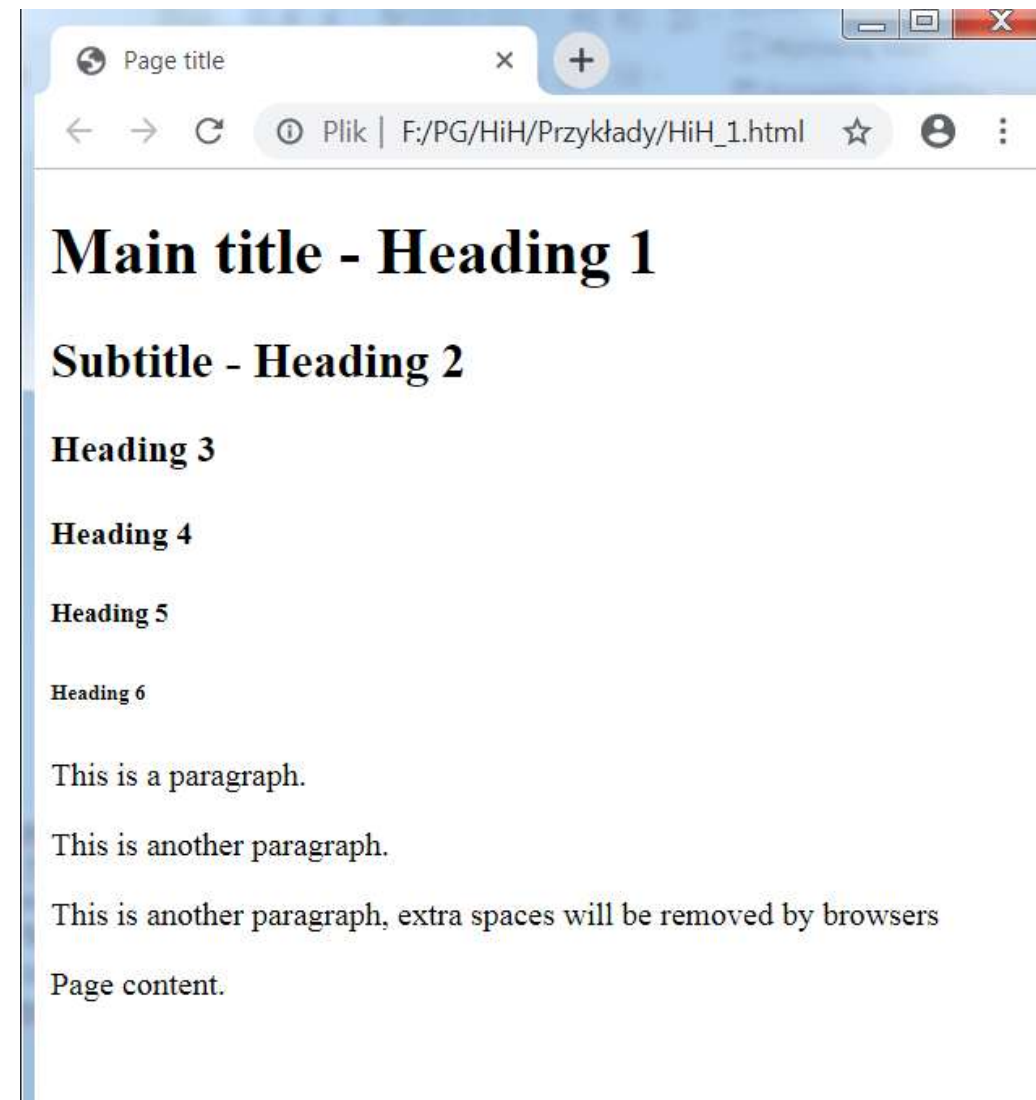
Per separare il testo, non ho capito in che modo

single line break

- `
`

```
<!DOCTYPE html>
<html >
  <head>
    <meta charset="UTF-8">
    <title>Page title</title>
  </head>
  <body>
    <h1>Main title - Heading 1</h1>
    <h2>Subtitle - Heading 2</h2>
    <h3>Heading 3</h3>
    <h4>Heading 4</h4>
    <h5>Heading 5</h5>
    <h6>Heading 6</h6>
    <p>This is a paragraph.</p>
    <p>This is another paragraph.</p>
    <p>This is another paragraph,      extra      spaces
      will be removed by browsers</p>
    Page content.

  </body>
</html>
```



Simple text formatting

content-based tags, logical tags

- selecting an area having a specific context or meaning indirect effect on the appearance
- `Bold Text Here`
`Italicized Text Here`

Vedi che entrambe le funzioni portano allo stesso risultato, anche se il significato è diverso (riascolta)

Bold Text Here
Italicized Text Here

physical style tags

- direct selection of fonts, sizes and colors
- `Bold Text Here`
`<i>Italicized Text Here</i>`

Hyperlink tag

one of the fundamental HTML mechanisms

used for navigation

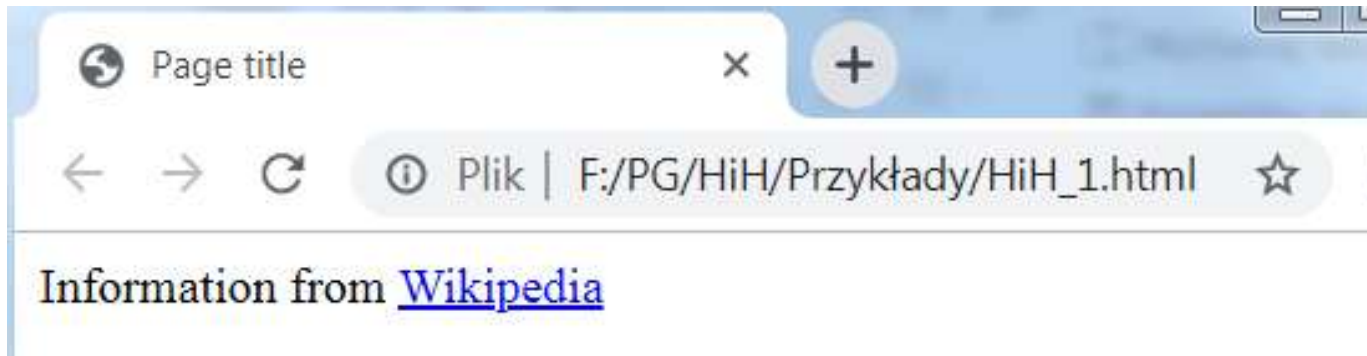
- inside an HTML document
- between different HTML documents

`place we can click `

Hyperlink tag

Information from

```
<a href="www.wikipedia.pl"> Wikipedia </a>
```



page1.html Collegamenti all'interno della stessa pagina:

```
<h1>Table of Contents</h1>
<a href='#Topic1'>
    Click to jump to the First Topic
</a>
<a href='#Topic2'>
    Click to jump to the Second Topic
</a>

<h2 id="Topic1">First topic</h2>
<p>Content about the first topic</p>
<h2 id="Topic2">Second topic</h2>
<p>Content about the second topic</p>
```

Collegamento a un punto preciso di un'altra pagina

```
<a href="page1.html#Topic1">Click to jump to the First Topic </a>
```

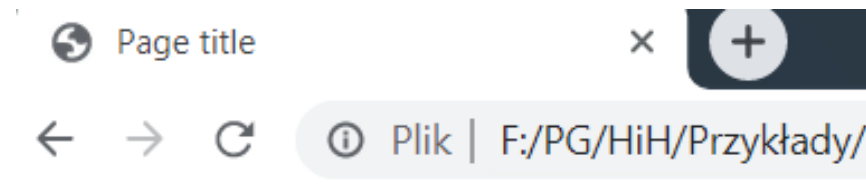


Table of Contents

[Click to jump to the First Topic](#)
[Click to jump to the Second Topic](#)

First topic

Content about the first topic

Second topic

Content about the second topic

Hyperlink tag <a>

```
<a href="https://www.wikipedia.com">  
  Wikipedia  
</a>
```

href

Open link in a new window or tab:

```
<a href="https://www.w3schools.com"  
  target="_blank">  
  Visit W3Schools  
</a>
```

target

- `_blank`: a new window or tab
- `_self`: the same window it was clicked in
- `_parent`: the parent window
- `_top`: the full window size of the browser

```
<a href="/images/myimage.jpg"  
  download="image1">  
  Download the image  
</a>
```

download

- *filename*

Hyperlink tag

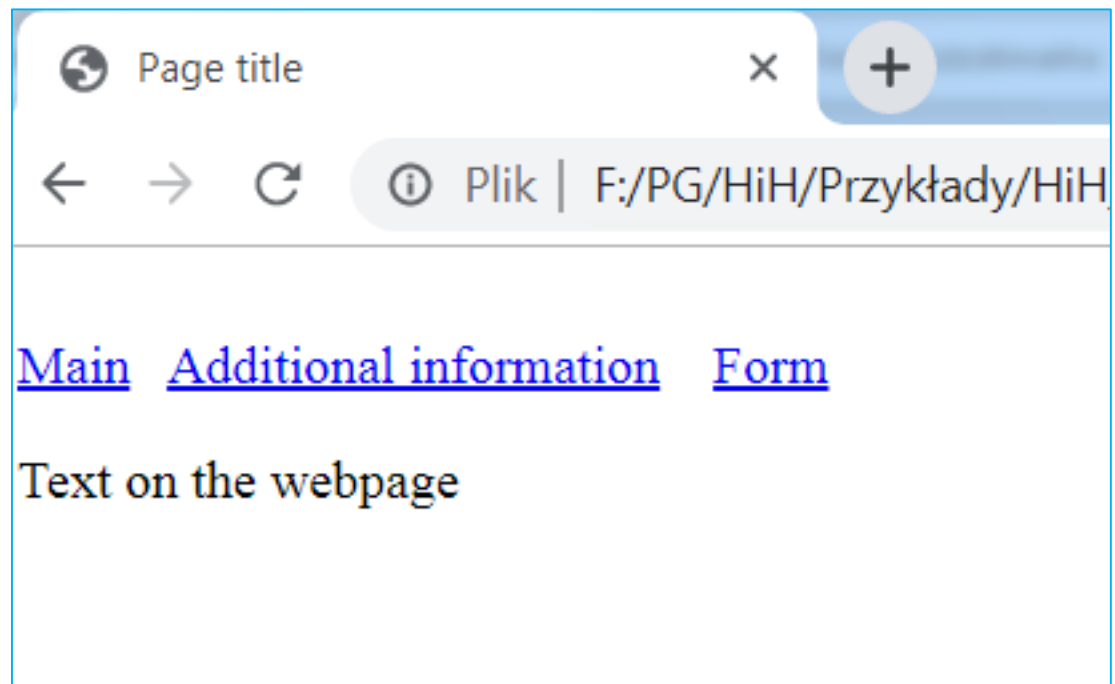
absolute

- always the same location (domain and folder)
- ``
Text Here
``

relative

- download file in relation to the HTML file
- ``
Text Here
``

Meglio questa!!! più versatile



```
<a href="Page1.html">Main</a>  
<a href="Page2.html">Additional information</a>  
<a href="Page3.html">Form</a>
```

Images in HTML

``

`<figure>`

`<picture>`

`<map>`

Images in HTML



```

```

src

- URL - web address

alt

- alternate text

title

- extra information about an element

**width,
height**

- size modification

Global attributes

attributes that can be used with all HTML elements

class

id

title

style

...



Smile

Non è un sostituto di è qualcosa di più avanzato

Images in HTML

```
<figure>  
    
  <figcaption>Smile </figcaption>  
</figure>
```

<figure>

- container

<figcaption>

- associate a caption with the image

Images in HTML



In questo caso l'immagine è cliccabile e porta da un'altra parte

```
<a href="page1.html">  
    
</a>
```


Image maps

```
  
<map name="shapes">  
  <area shape="polygon" coords="79,6,5,134,153,134" href="wikipedia.pl">  
  <area shape="rectangle" coords="177,6,306,134" href="onet.pl">  
  <area shape="circle" coords="397,71,65" href="wp.pl">  
</map>
```

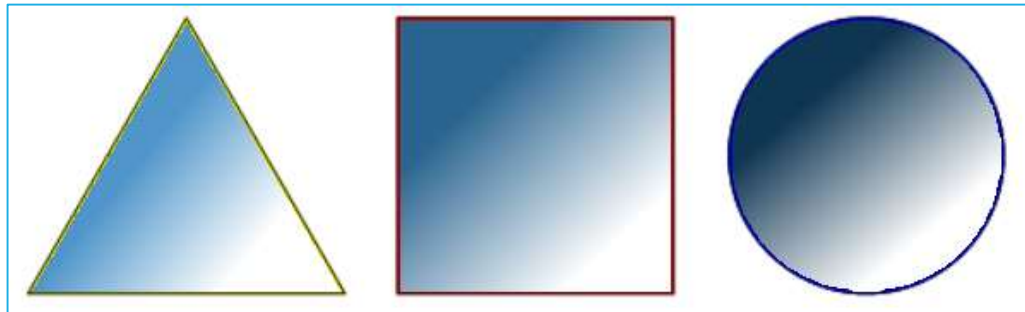


Image maps

an image-map is an image with clickable areas

map <map> attributes and subelements

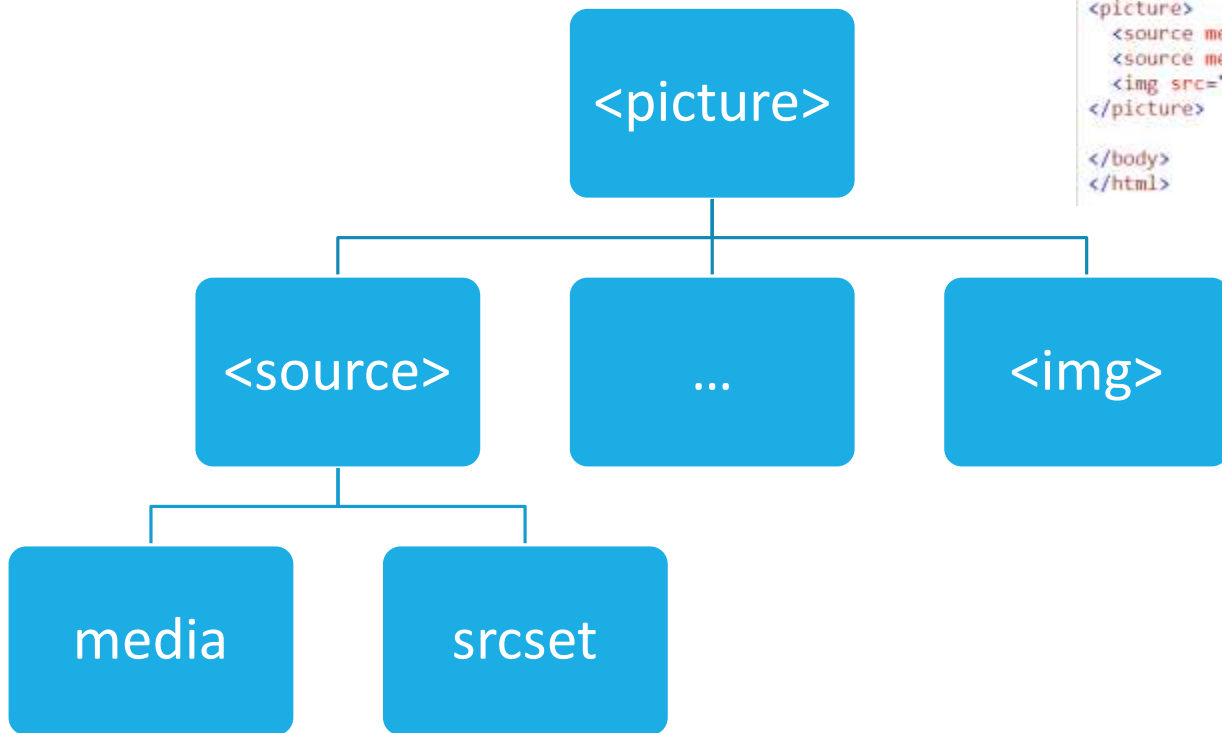
- name
- <area>
 - coords
 - shape
 - href

image attributes

- usemap
 - map name

Un altro tag ancora...

Images in HTML



```
<!DOCTYPE html>
<html>
<head>
<meta name="viewport" content="width=device-width, initial-scale=1.0">
</head>
<body>

<h1>The picture element</h1>

<p>Resize the browser window to load different images.</p>

<picture>
  <source media="(min-width:650px)" srcset="img_pink_flowers.jpg">
  <source media="(min-width:465px)" srcset="img_white_flower.jpg">
  
</picture>

</body>
</html>
```

The picture element

Resize the browser window to load different images.



Result Size: 467 x 559 [Get your own website](#)

The picture element

Resize the browser window to load different images.

Tables

`<table> ... </table>` the whole table

`<tr> ... </tr>` each row

`<td> ... </td>` each cell in row

`<th> ... </th>` cell from the header row

possibility to present numerical data

create tabular data sets

cell contents

- any element: text, image, link, form, etc.

```
<table>
  <tr>
    <th>Test</th>
    <th>Score</th>
  </tr>
  <tr>
    <td>1</td>
    <td>20</td>
  </tr>
  <tr>
    <td>2</td>
    <td>30</td>
  </tr>
  <tr colspan="2">
    <td>Sum: 50</td>
  </tr>
</table>
```

Test	Score
1	20
2	30
Sum: 50	

colspan per espandere unire due colonne

Lists

organizing information in the form of an enumeration

unordered list

``

ordered list

``

description list

`<dl>`

Lists

unordered list

```
<ul>  
  <li>Item</li>  
  <li>Next item</li>  
  <li>Yet another item</li>  
</ul>
```

- Item
- Next item
- Yet another item

Lists

ordered list `` ``

```
<ol>  
  <li>HTML</li>  
  <li>XML Schema</li>  
  <li>XSL</li>  
</ol>
```

1. HTML
2. XML Schema
3. XSL

Lists

ordered list `` ``

```
<ol start="3">  
  <li>Item</li>  
  <li value="7">Next item</li>  
  <li>Yet another item</li>  
</ol>
```

3. Item
7. Next item
8. Yet another item

```
<ol start="10" type="I" reversed>  
  <li>Item</li>  
  <li>Next item</li>  
  <li>Yet another item</li>  
</ol>
```

Per cambiare il tipo di numerazione

- X. Item
- IX. Next item
- VIII. Yet another item

Lists

```
<ul>
  <li>item 1</li>
  <li>item 2
    <ul>
      <li>sub-item 2.1</li>
      <li>sub-item 2.2</li>
    </ul>
  </li>
  <li>item 3</li>
</ul>
```

- item 1
- item 2
 - sub-item 2.1
 - sub-item 2.2
- item 3

Lists

description list <dl> <dt>

```
<dl>  
  <dt>hypertext</dt>  
  <dd>non-linear text material</dd>  
  <dt>hypermedia</dt>  
  <dd>media in a non-linearly organized system</dd>  
</dl>
```

hypertext

non-linear text material

hypermedia

media in a non-linearly organized system

Comments

<!-- This is a comment -->

<!--

This paragraph

also

is a comment ...

-->

Forms

A fragment of an HTML document that contains controls for entering data

- a mechanism that allows the user to transfer data to the web application
- text, radio buttons, checkboxes, ...

The basic method of interaction between the user and the web application

Allows entering data via the user interface (as in desktop applications)

Forms

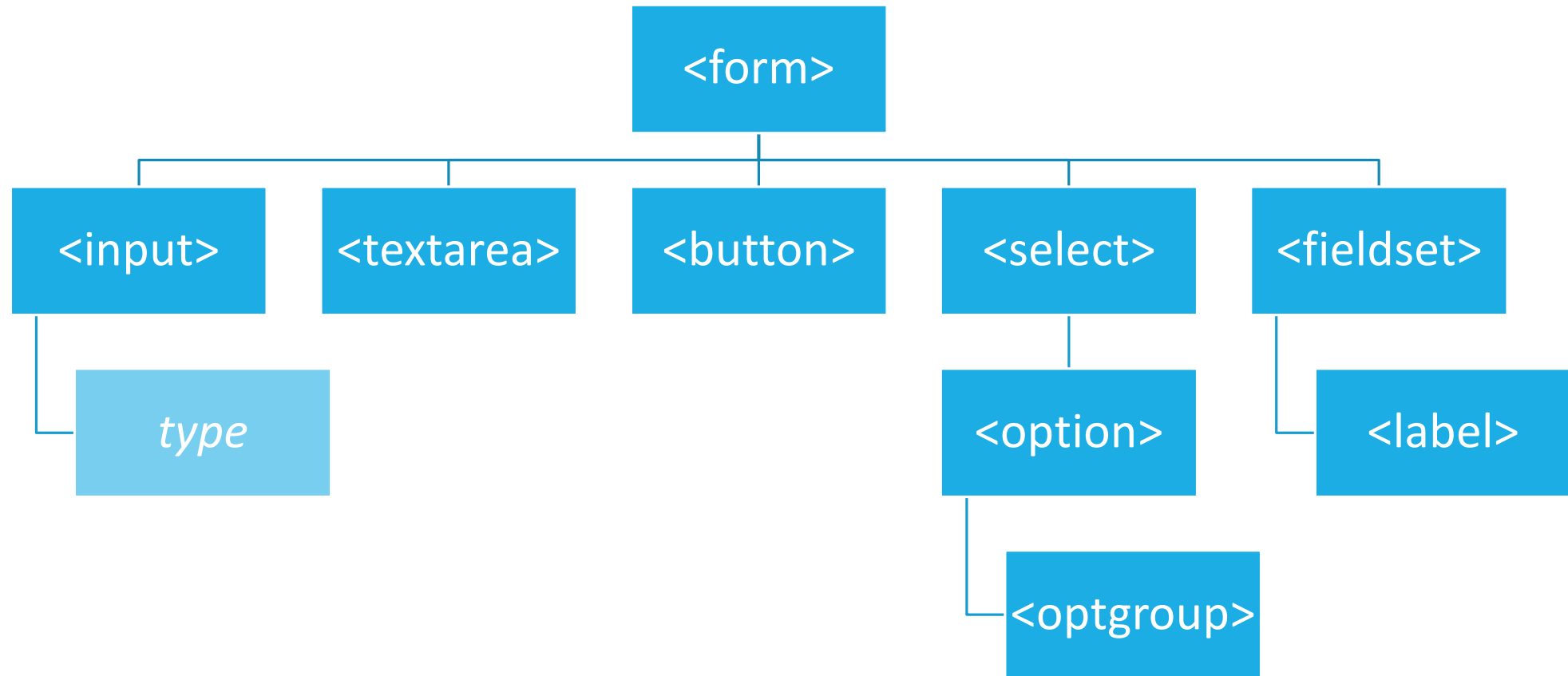
`<form>` provides a mechanism to interact with the user

- attribute *action* : **where** the data is to be sent (URL)
- attribute *method* : **how** the data is to be sent
 - post
 - get (default)
- attribute *name*

`<form action="action.php" method="get">`

`<form action="action.php" method="post">`

Forms



Text box

```
<!DOCTYPE html>
<html>
<body>
  <h2>Registration form</h2>
  <form action="/action.php">
    Name:
    <input type="text" name="name" value="Please, enter your name">
  </form>
</body>
</html>
```

Registration form

Name:

Password

```
<!DOCTYPE html>
<html>
<body>
  <h2>Registration form</h2>
  <form action="/action.php">
    Name:
    <input type="text" name="name" value="Please, enter your name"><br/>
    <label for="pswd">Password:</label>
    <input type="password" name="gender" id="pswd" ><br/>
  </form>
</body>
</html>
```

Label... non hai capito
for e id should be the same

Registration form

Name:

Password:

Radio button

```
<!DOCTYPE html>
<html>
<body>
  <h2>Registration form</h2>
  <form action="/action.php">
    Name:
    <input type="text" name="name" value="Please, enter your name"><br/>
    <label for="pswd">Password:</label>
    <input type="password" name="gender" id="pswd" ><br/>
    Gender:
    <label for="male">Male</label>
    <input type="radio" name="gender" id="male" value="male" checked>
    <label for="female">Female</label>
    <input type="radio" name="gender" id="female" value="female">
  </form>
</body>
</html>
```

Registration form

Name:

Password:

Gender: Male ☒ Female ☐

Checkbox

```
<label for="male">Male</label>
<input type="radio" name="gender" id="male" value="male" checked>
<label for="female">Female</label>
<input type="radio" name="gender" id="female" value="female"><br/>
Programming languages:
<input type="checkbox" name="c" value="c" checked>C++
<input type="checkbox" name="java" value="Java">Java
</form>
</body>
</html>
```

Registration form

Name:

Password:

Gender: Male ☒ Female ☐

Programming languages: ☒ C++ ☐ Java

Select list

```
Programming languages:  
<input type="checkbox" name="c" value="c" checked>C++  
<input type="checkbox" name="java" value="Java">Java <br/>  
Semester  
<select>  
  <option value="1">1</option>  
  <option value="2">2</option>  
  <option value="3">3</option>  
</select>  
</form>  
</body>  
</html>
```

```
<select name="colorlist" id="colorlist">  
  <option value="0">Choose a color</option>  
  <option value="red">Red</option>  
  <option value="blue">Blue</option>  
  <option value="green">Green</option>  
  <option disabled value="orange">Orange</option>  
</select>
```

Registration form

Name:

Password:

Gender: Male ☒ Female ☐

Programming languages: ☒ C++ ☐ Java

Semester

Choose a color ▼

Choose a color

Red

Blue

Green

Orange

Text area

```
<option value="1">1</option>
<option value="2">2</option>
<option value="3">3</option>
</select><br/><br/>
<textarea rows="7" cols="70">
  please, write your comment
</textarea>
</form>
</body>
</html>
```

Registration form

Name:

Password:

Gender: Male ☒ Female ☐

Programming languages: ☒ C++ ☐ Java

Semester

please, write your comment

File field

```
    please, write your comment  
</textarea><br/>  
    attach file:  
    <input type="file" name="file">  
  </form>  
</body>  
</html>
```

Registration form

Name:

Password:

Gender: Male ☒ Female ☐

Programming languages: ☒ C++ ☐ Java

Semester

please, write your comment

attach file: Nie wybrano pliku

Submit and Reset buttons

```
        please, write your comment  
</textarea><br/>  
attach file:  
<input type="file" name="file"><br/>  
<input type="submit" value="Submit">  
<input type="reset">  
</form>  
</body>  
</html>
```

Registration form

Name:

Password:

Gender: Male ☒ Female ☐

Programming languages: ☒ C++ ☐ Java

Semester

please, write your comment

attach file: Nie wybrano pliku

Forms

form layout

- <div>, <p>
- <fieldset>, <legend>
- <label>

```
<form method="post" action="b.txt">
  <fieldset>
    <legend>Personal data:</legend>
    <label for="name"> Name and surname: </label>
    <input type="text" id="name"><br>
    email: <input type="email"><br>
    <input type="submit" value="Send" />
    <button type="button">Confirm</button>
  </fieldset>
</form>
```

Personal data:

Name and surname:

email:

Attributes of form tags

name

- name of the form's element

value

- default value of the field (text box, password)
- label of the button (buttons),
- the value of the element sent to application (checkbox, radio buttons)

readonly (yes|no)

- specifies that the input field cannot be changed

checked (yes|no):

- specifies that the element is checked

Attributes of form tags

Enter your surname

```
<input ... value="Enter your surname"/>
```

Choose one or more colours

- Red
- Blue
- Green
- Orange

```
<select ... multiple="yes" size="4">
```

garden spider ▼

Spiders

- garden spider
- tygrzyk

Birds

- owl
- stork

```
<select>
```

```
<optgroup label="spiders">
```

```
<option value="krzyżak">garden spider</option>
```

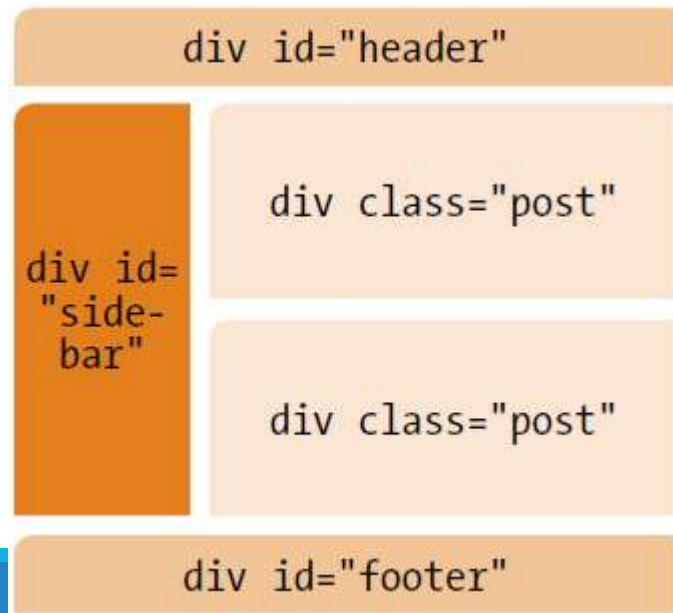
```
<option value="tygrzyk">tygrzyk</option>
```

```
</optgroup>
```

Page division

<div>

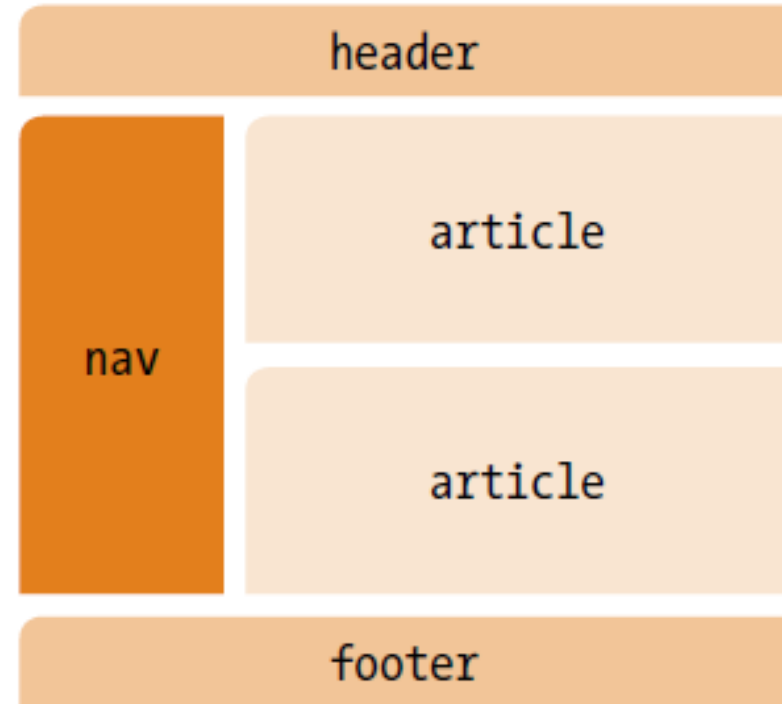
- defines a section in a HTML document
- used to group block-elements to format them with styles



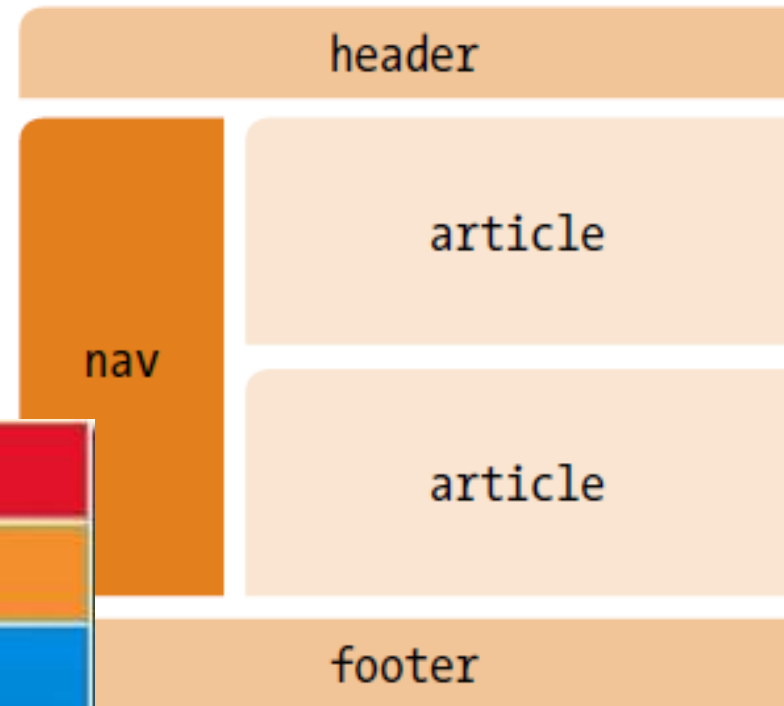
```
<div id="header">
  <h1>My interesting life</h1>
</div>
<div id="sidebar">
  <h2>Menu</h2>
  <ul>
    <li><a href="last-week.html">Last
week</a></li>
    <li><a
href="archive.html">Archives</a></li>
  </ul>
</div>
```

```
<div id= "header">
<h1>My interesting life</h1>
</div>
<div id= "nav">
<h2>Menu</h2>
<ul>
<li><a href="last-week.html">Last
week</a></li>
<li><a
href="archive.html">Archives</a><
/li>
</ul>
</div>
```

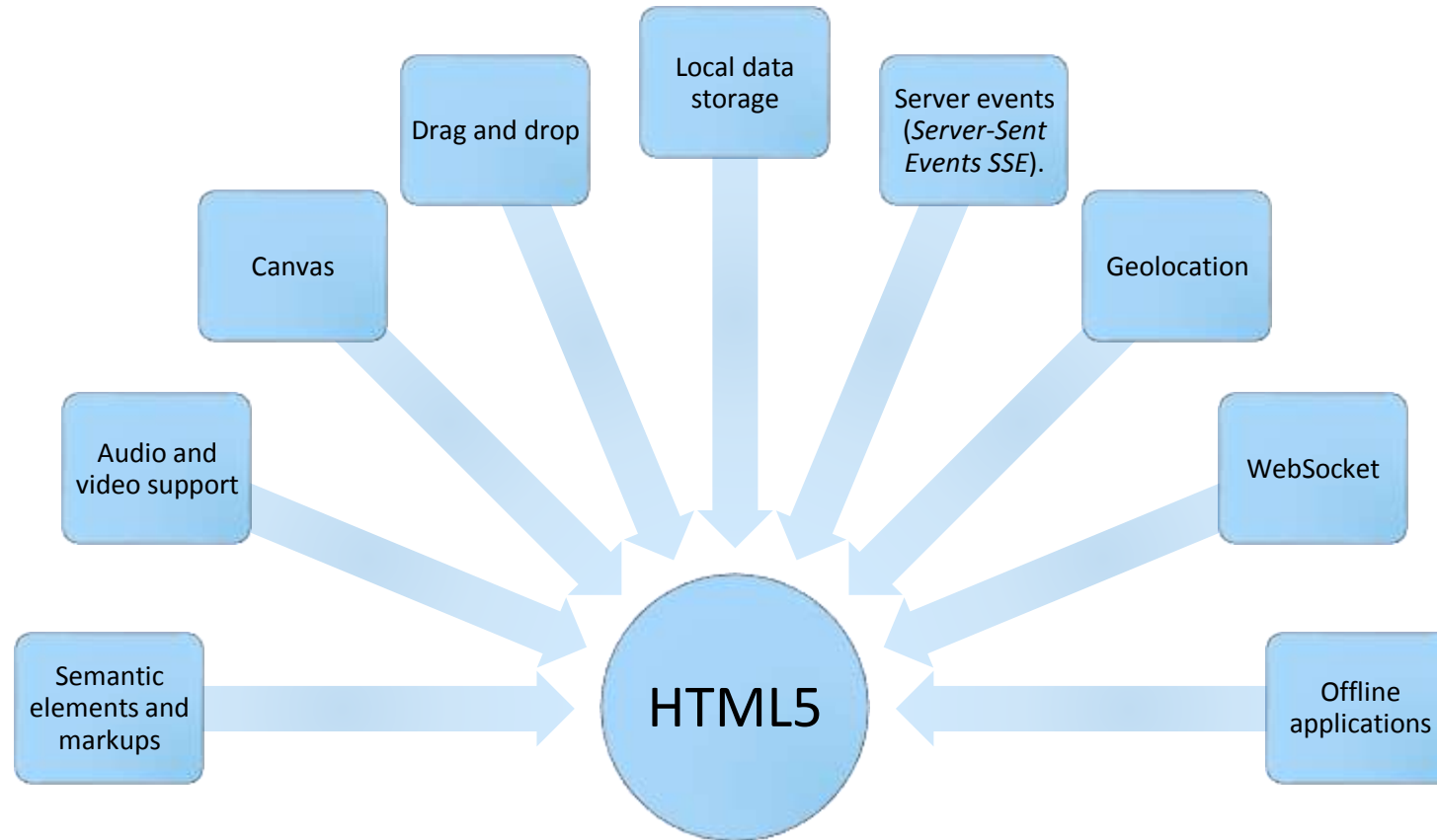
div id=" header"



```
<header>
<h1>My interesting life</h1>
</header>
<nav>
<h2>Menu</h2>
<ul>
<li><a href="last-week.html">Last
week</a></li>
<li><a
href="archive.htm
/li>
</ul>
</nav>
```



HTML5: new features



Canvas



Possibility of drawing

- The <canvas> tag is only a container for graphics
- A canvas is a rectangular area of a raster graphics
- JavaScript is needed for drawing on canvas

```
<canvas id="my-first-canvas" width="360" height="240">
```

Here we give the text displayed when the browser does not support canvas.

```
</canvas>
```

```
<script>
```

```
var c = document.getElementById( 'my-first-canvas' );
```

```
var cxt = c.getContext('2d');
```

```
var grd=cxt.createLinearGradient(0,0,175,50);
```

```
grd.addColorStop(0,"#FF0000");grd.addColorStop(1,"#0000FF");
```

```
cxt.fillStyle=grd; cxt.fillRect(0,0,175,50);
```

```
</script>
```

Canvas

- Functionality

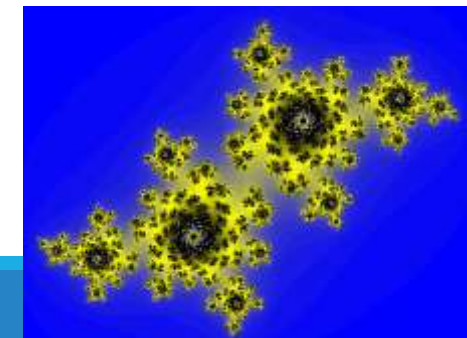
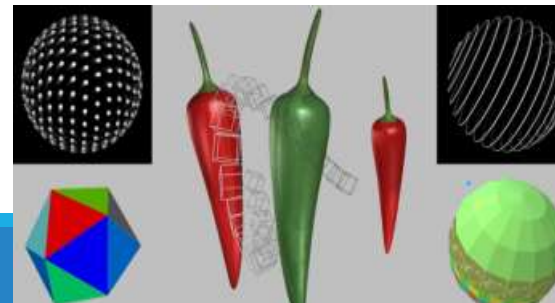
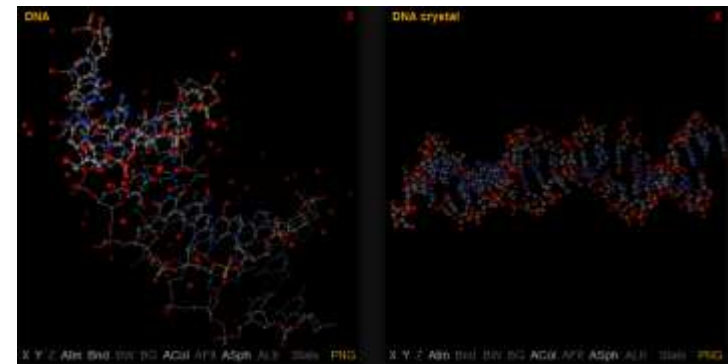
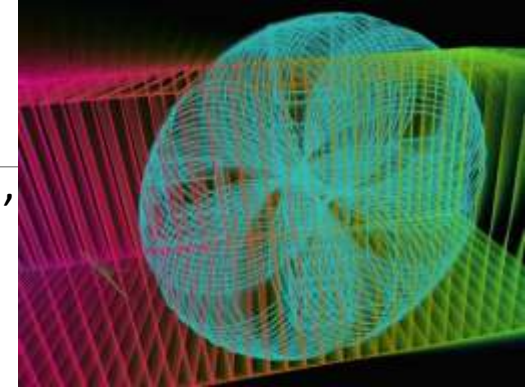
- drawing rectangles and paths (lines, bows, curves Beziera, ...),
- filling figures with a color, pattern or gradient,
- drawing subtitles,
- support for transparency,
- transformations (shifting, scaling, skewing etc.),
- embedding raster images (PNG, JPEG, GIF),
- shading,
- ...

- Usage

- graphs and charts,
- games,
- ...

- SVG

- the ability to put code in HTML



<video>

The controls attribute adds video controls, like play, pause, and volume.

<source>

- The browser will use the first recognized format



```
<video controls width="360" height="240" poster="placeholder.jpg">
  <source src="movie.mp4" type="video/mp4">
  <source src="movie.webm" type="video/webm">
  <source src="movie.ogv" type="video/ogg">
  <object type="application/x-shockwave-flash" width="360"
height="240" data="player.swf?file=movie.mp4">
<param name="movie" value="player.swf?file=movie.mp4">
<a href="movie.mp4">Download the movie</a>
  </object>
Przeglądarka nie obsługuje znacznika video
</video>
```

<audio>

similar to the tag <video>



```
<audio controls>
  <source src="pliczek.ogg" type="audio/ogg">
  <source src="pliczek.mp3" type="audio/mpeg">
  <object type="application/x-shockwave-flash"
data="player.swf?soundFile=pliczek.mp3">
<param name="movie" value="player.swf?soundFile=pliczek.mp3">
<a href="pliczek.mp3">Download the song</a>
  </object>
</audio>
```

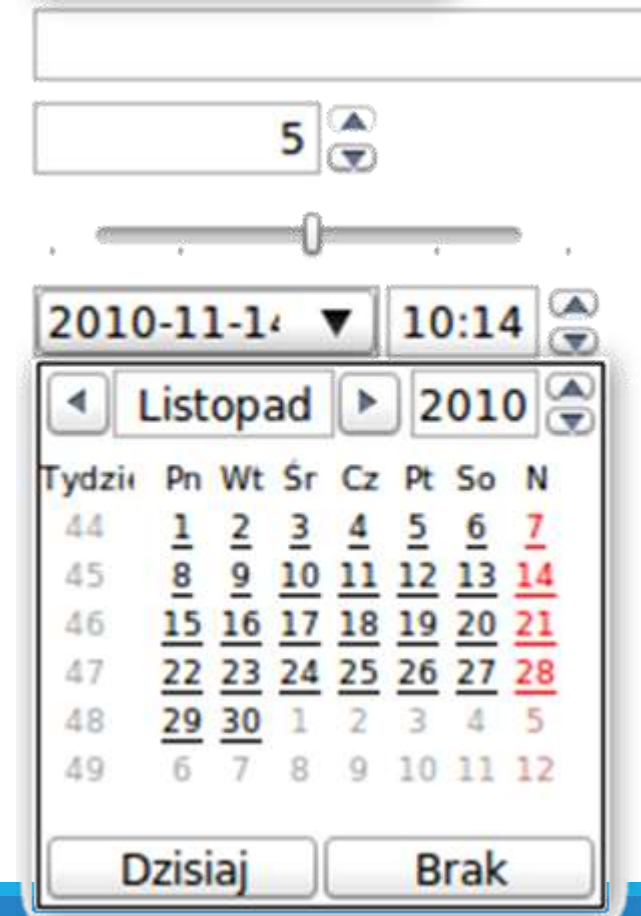
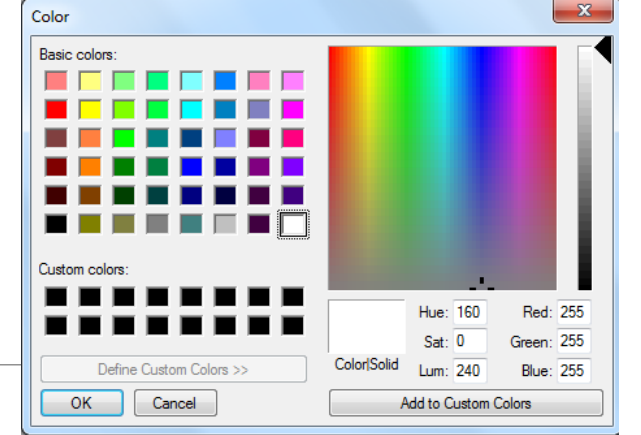
New controls

```
<input name="url" type="url">
```

```
<input name="number" type="number" min="1" max="5">
```

```
<input name="number" type="range" min="1" max="5">
```

```
<input name="date" type="date">
```



Geolocation API

- The HTML Geolocation API is used to locate a user's position.
- User permission is required
- Location
 - based on the client's IP address
 - based on the near BTS signal strength measurement
 - based on built-in GPS
- Available
 - geographic coordinates, user movement speed, direction of movement ...