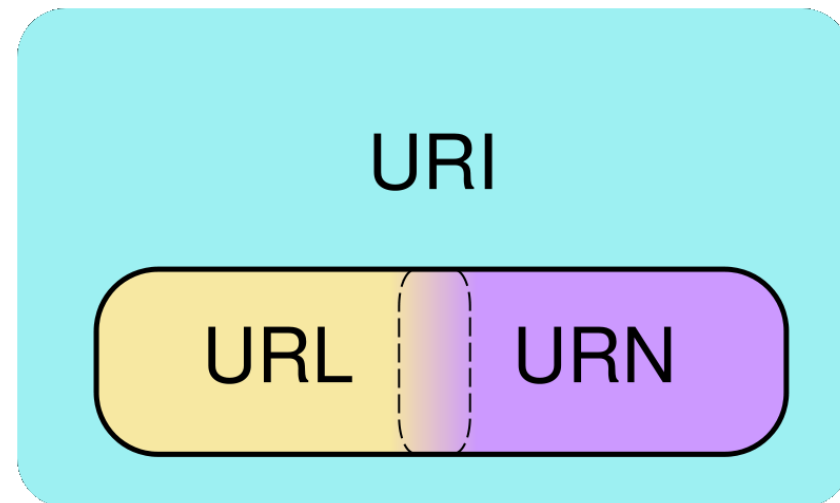


Basic WWW Elements

- Document Format
 - Hypertext Markup Language, HTML
 - Document Type Definition (DTD)
- Transfer Protocol
 - Hypertext Transfer Protocol, HTTP (ASCII coded Request-Reply Protocol via TCP/IP)
- Uniform Identification Schema: Uniform Resource Identifier, URI
 - Resources have to be addressable (per name, per "address" or location)
 - Each Resource should be separately identifiable

Uniform Resource Identifier (URI)

- An URI functions as a locator ("address"), a name, or both
- Syntax for all types of IDs
`<uri> ::= <scheme>": "<scheme-specific part>`
- `<scheme>` defines a name schema for an URI
- `<scheme-specific part>` contains a particular ID according to the scheme
- Examples:
 - file – files within the local file system
 - ftp – File Transfer Protocol
 - http – Hypertext Transfer Protocol
 - mailto – E-Mail Address



Source: en.wikipedia.org

Uniform Resource Locator (URL)

- URL scheme definitions:
http, https, ftp, news, mailto, telnet, and others
- Scheme-specific part definitions of a general form
["//"] [user [":"password] "@" host [":"port] ["/"url-path]
- relative and absolute URLs are possible
 - Absolut:
dilbert.com/comics/dilbert/archive/images/dilbert20080112223505.gif
 - Relative: dilbert20080112223505.gif
 - But what is <http://www3.dhbw-mannheim.de/index.php?id=inf???>

URL Syntax

URL: ["//"] [user [":"password] "@"] host [":"port] ["/"url-path]

- user: An optional user name. Some schemes (e.g., ftp) allow the specification of a user name
- password: An optional password. If present, it follows the user name separated from it by a colon
- The user name (and password), if present, are followed by a commercial at-sign "@". Within the user and password field, any ":", "@", or "/" must be encoded
- host: The fully qualified domain name of a network host, or its IP address
- port: The port number to connect to; in most cases: default port number (80 für http)
- url-path: supplies the details of how the specified resource can be accessed. Note that the "/" between the host (or port) and the url-path is NOT part of the url-path

Rules: URI, URN, and URL

Adresses have to conform to a particular rule set:

- Character set: ISO Latin-1 (similar to ASCII charset)
- No blank characters: Masking through %20.
- Reserved Characters, e.g.,:
 - Escape Char (%): identifies special characters
 - Hierarchy Char (/): Separation of directory and file names
 - Fragment Delimiter (#): Separation of URI of a data object from a Fragment or part of the data object
 - Query Delimiter (?): separates request string to a resource from its identification

HTML and CSS

Standard Generalized Markup Language (SGML, 1986)

- Meta language ("language about languages") to describe markup languages for documents
 - A markup language describes is made of text and annotations describing formatting, layout, and structure
- Defines abstract syntax which can be realised as different languages
- ISO Standard (ISO 8879:1986 Information Processing — Text and Office Systems — Standard Generalized Markup Language (SGML))

HTML

- HTML and HTTP were invented by Tim Berners-Lee
- Berners-Lee's goal was to create a simple markup language for presenting research results
- HTML is based upon SGML (international standard for marking up text for different physical devices)
- Most of the standards on the Web are developed/ratified by the W3C (World Wide Web Consortium)
www.w3c.org

HTML History

■ HTML 1.0 (1992)

- Was never specified by the W3C
- Supported only rudimentary elements (no images, no tables/forms/font/background images etc.)
- Was only supported by browser Mosaic 1.0

■ HTML 2.0 (11/1995)

- Background colors and images were supported
- Introduction of tables and forms
- Several features of Netscape browser (launched between HTML 1.0 and 2.0) were adopted

HTML History

- HTML 3.2 (01/1997)
 - Introduction of Cascading Stylesheets (CSS)
 - New Layout tags
- HTML 4.0 (12/1997)
 - Emphasis on using CSS for formatting
- XML 1.0 (02/1998)
 - Application of SGML concepts to HTML (XML is a subset of SGML)
 - Universal way of describing data and formatting

HTML History

- CSS 1.0 (1996) and 2.0 (1998)
 - Separation from contents and formatting
 - Formatting can be defined in a "stylesheet" (*.CSS) or inline
 - "cascading" means that styles can be overridden by subsequent style definitions
- HTML 4.01(12/1999)
 - Fixed some errors of HTML 4.0
 - Last HTML version

HTML History

- XHTML 1.0 (01/2000)
 - Same expressiveness as HTML
 - Conforms to XML syntax (can be checked programmatically)
 - Pages are based on three "templates" called "document type definitions" (DTDs)
 - XHTML 1.0 Strict: features of HTML 4.01 formulated in XML
 - XHTML 1.0 Transitional: Allows some formatting elements in addition to Strict
 - XHTML 1.0 Frameset: Supports framesets
 - More restrictive than HTML
- XHTML 1.1 (05/2001)
 - re-definition of XHTML Strict
 - Formatting only via CSS
 - All formatting tags are not valid with XHTML 1.1 Strict

HTML History

■ XHTML 2.0

- Goal: solely XML-based format
- 2009: W3C announced that XHTML 2.0 was discontinued

■ CSS3

- modularized specification
- new speech output, gradient colors, backgrounds, text effects, ...

■ HTML5

- First published as "Web Applications 1.0" in 2004
- First draft 2008
- October, 2014: Recommendation
- adds new HTML elements ("Widgets"), new DOM, ...
- supported by many browsers, but not fully implemented yet

ACID2 Test

tinyurl.com/s5ecp

- ACID2 is a test suite published by the Web standards project released in 1995
- ACID2 tests HTML and CSS features
- ACID2 is the successor of the ACID test (1998)

Hello World!



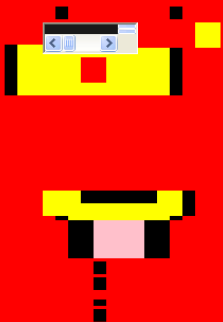
Hello World!



Reference

Firefox 2.0.0.12,
Windows XP

Hello World!



Internet Explorer 7.0.5730.11,
Windows XP

HTML Concept and Syntax

- Text and formatting ("tags") is combined within HTML documents
- Tags start with a left-pointing angle bracket "<" and end with a right-pointing angle-bracket ">"
- Everything between brackets is formatting
- Tags are interpreted by browsers as formatting and structuring
- Tags are closed in the opposite order they were opened
`<i>some text</i>`

Example Tag

Here follows a `bold` word.

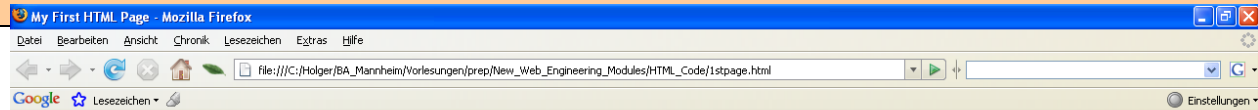
is displayed as

Here follows a **bold** word.

Your first Web Page

firstpage.html

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN"
"http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
<html>
  <head>
    <title>My First HTML Page</title>
  </head>
  <body>
    <p>Hello, this is my first HTML page!</p>
  </body>
</html>
```



Hello, this is my first HTML page!

Document Type Tag

- Specifies to which format and conventions a document follows (used by Browsers and validation tools)
- The document's top tag is html
- Link to a DTD (document type definition) included

- Strict

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

- Transitional

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

- Frameset

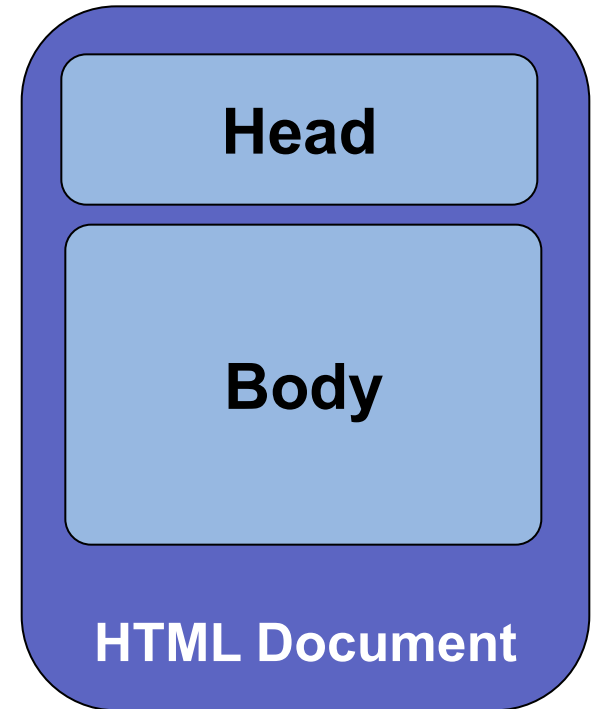
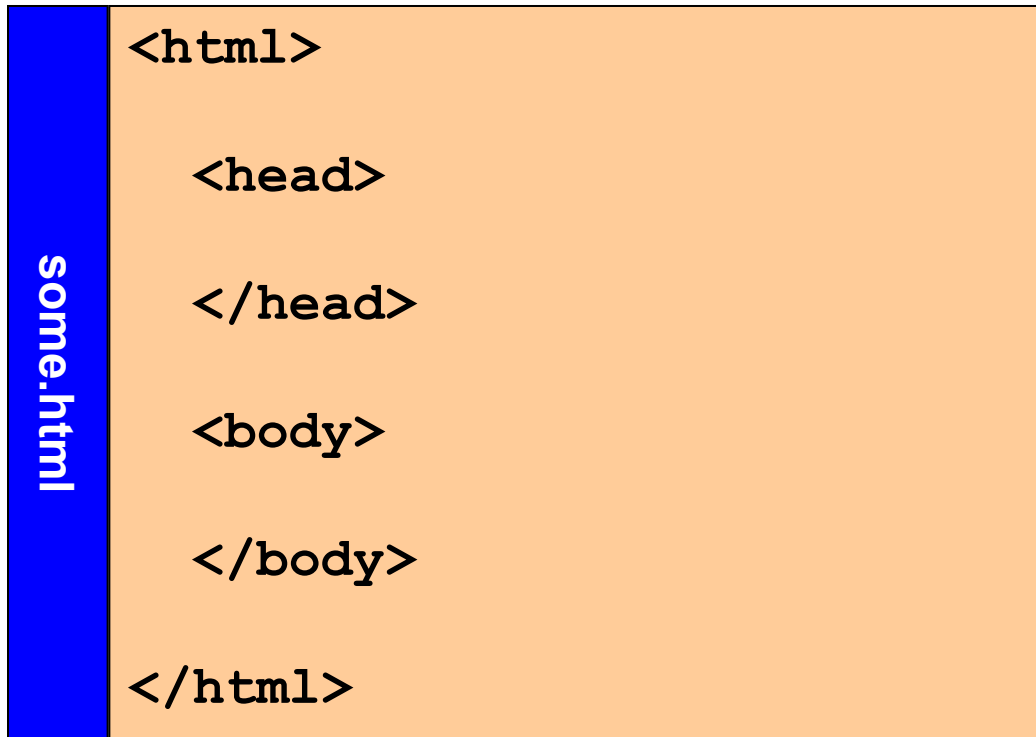
- `<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Frameset//EN" "http://www.w3.org/TR/xhtml1/DTD/xhtml1-frameset.dtd">`

DTD

Example: <http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd>

```
<!ELEMENT a %a.content;>
<!ATTLIST a
  %attrs;
  %focus;
  charset      %Charset;      #IMPLIED
  type         %ContentType;   #IMPLIED
  name         NMTOKEN         #IMPLIED
  href         %URI;           #IMPLIED
  hreflang     %LanguageCode;  #IMPLIED
  rel          %LinkTypes;     #IMPLIED
  rev          %LinkTypes;     #IMPLIED
  shape        %Shape;        "rect"
  coords       %Coords;       #IMPLIED
>
```

Anatomy of a Web Page



HTML & HEAD Tag

■ HTML Tag

- Indicates beginning and end of an XHTML document

■ Head Section Tag

- Contains meta information (information about the document)

```
<meta name="author" content="John Doe" />
```

```
<meta name="keywords" content="Web Engineering, XHTML, HTML" />
```

- Can be used to define inline styles (<style>) or scripts (<script>)
- <title> defines the document's title being shown in Browser's title bar
- Special application: re-direction
 - The following code sends a user (redirects him) to google.de after 5 seconds

```
<meta http-equiv="refresh" content="5;  
URL=http://www.google.de" />
```

Body Tag

- Contains all visible contents
- Can contain JavaScript event code

`<body onclick="alert('Hello World');">`

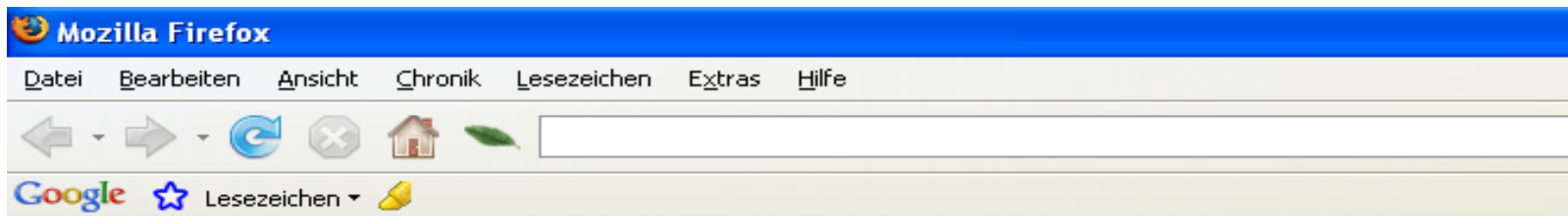


Paragraphs

- Text can be grouped into Paragraphs
- Paragraph tag is <p>

<p>Lorem ipsum dolor sit amet, consectetur adipiscing elit.
Pellentesque sed arcu. Sed rutrum magna quis lacus. </p>

<p>Lorem ipsum dolor sit amet, consectetur adipiscing elit.
Pellentesque sed arcu. Sed rutrum magna quis lacus. </p>



Lorem ipsum dolor sit amet, consectetur adipiscing elit. Pellentesque sed arcu. Sed rutrum magna quis lacus.

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Pellentesque sed arcu. Sed rutrum magna quis lacus.

Text Formatting

- The tag is deprecated with HTML 4.01:
`Some Text`
- -> Cascading Style Sheets (CSS) ... will be discussed later
- **Special Inline Text Elements**
 - - non breaking space (prevents line break at space position)
 - ­ - soft hyphen (allows word break if necessary)
- **Manual Line Breaks**
 -

Text Formatting

Inline Text Attributes

- `<cite>` - citation
- `<code>` - source code
- `<dfn>` - definition term
- `` - emphasized text
- `<kbd>` - keyboard text
- `<samp>` - sample source code
- `` - strongly emphasised text
- `<var>` - variables



citation

`source code`

definition term

emphasized text

`keyboard text`

`sample source code`

strongly emphasised text

variables

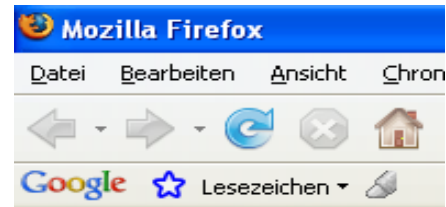
Text Formatting

■ Headings

- `<h1>Heading 1</h1>`
- `<h2>Heading 2</h2>`
- `<h3>Heading 3</h3>`
- `<h4> Heading 4</h4>`
- `<h5> Heading 5</h5>`
- `<h6> Heading 6</h6>`

■ Horizontal Lines

- `<hr/>`



Heading 1

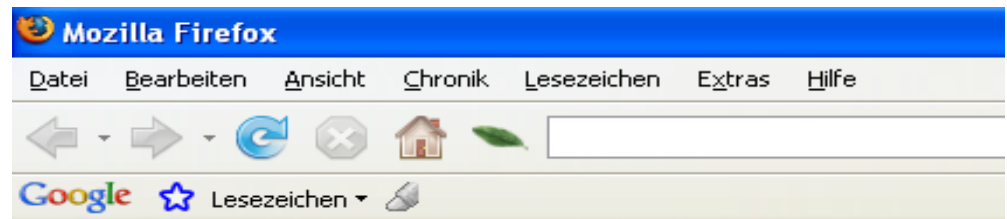
Heading 2

Heading 3

Heading 4

Heading 5

Heading 6



Text above line...

Text below line...

Text Formatting

■ Preformatted Text

```
<pre>
```

```
+-----+-----+
| Name           | Student ID      |
+-----+-----+
| Peter          | 1111            |
| Paul           | 2222            |
| Mary           | 3333            |
+-----+-----+
```

```
</pre>
```

■ Block Divisions

```
<div> Suspendisse massa risus, pellentesque vel, sollicitudin ac,
      vestibulum sed, justo. Ut in nibh eu risus vulputate tempor. Aliquam
      vitae diam vitae sapien tincidunt sodales. Sed sit amet erat ut
      tortor ultrices pellentesque. Morbi sodales. Duis varius diam vel
      sapien. In imperdiet. Nulla facilisi. Sed ultricies lobortis elit.
      In sit amet dui.
```

```
</div>
```

- <div> is also used as a successor to table-based layouts
- -> barrier-free Web design ("Web Accessibility")

Text Formatting: Lists

■ Ordered (numbered) Lists

```
<ol start="4" style="list-style-type: decimal">
  <li>Element 1</li>
  <li>Element 2 </li>
  <li>Element 3 </li>
</ol>
```

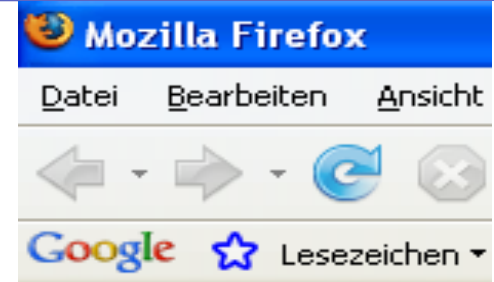
■ list-style-type values:

- decimal = 1.,2.,3.,4.
- lower-roman = i.,ii.,iii.,iv.
- upper-roman = I.,II.,III.,IV.
- lower-alpha or lower-latin = a.,b.,c.,d.
- upper-alpha or upper-latin = für A.,B.,C.,D.
- none = no numbering

■ Unordered Lists

```
<ul style="list-style-type: disc">
  <li>Item 1</li>
  <li>Item 2</li>
  <li>Item 3</li>
</ul>
```

■ list-style-types: disk, circle, square, none



4. Element 1
5. Element 2
6. Element 3

- ◆ Item 1
- ◆ Item 2
- ◆ Item 3

- ◇ Item 1
- ◇ Item 2
- ◇ Item 3

- Item 1
- Item 2
- Item 3

- Item 1
- Item 2

Exercises 2.1 + (2.2)

Hyperlinks

`http://username:password@www.abc.com:8080/info/details/list.php?address_id=12345&lang=en`

Protocol | Login Information | Host | Port | Path | File | Argument(s)

- Protocol (`http://`)
 - specifies the protocol to be used to access resource
 - default in Browser is `http`
 - other protocols such as `https` (secure `http`) or `ftp` can be specified here
- Login Information (`username:password`)
 - optional login information
- Host (`www.abc.com`)
- Port (`8080`)
 - standard port is 80 for HTML
- `info/details/`
 - path to resource
- `list.php`
 - resource/file to be accessed
- Parameter(s) (`address_id=12345&lang=en`)
 - if more than one parameter, concatenation via "&"

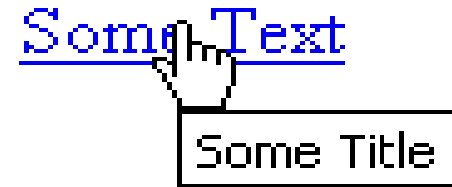
Relative and Absolute URLs

- Absolute URLs point to a resource directly while relative URLs relate to a particular path
- Example:
 - Files on hard disk:
 - `c:\data\www\htdocs\file1.html`
 - `c:\data\www\htdocs\others\file3.html`
 - www root is `c:\data\www\htdocs\`
 - Absolute Path to `file3.html`: `www.mydomain.de/others/file3.html`
 - Relative Path to `file3.html` (within `file1.html`): `./others/file3.html`

The Anchor Tag ("Link")

The Anchor Tag

- `Some Text`
- **With Title**
 - "Tooltip Text" behavior
 - `Some Text`
- Anchor Tag not be confused with the `<link>` Tag
- **Other form...**
 - `< a name="anchor_name"> some text `
 - The hyperlink
`...`
jumps to the defined anchor within web page



The Anchor Tag ("Link")

■ Keyboard Shortcuts and Tab Orders

- Behaviour to use shortcuts may differ between OSs and Browsers.

- Under Windows, <ALT>+character is used

```
<a href="url" accesskey="C" tabindex="3">Some Text 1</a>
```

```
<a href="url" accesskey="B" tabindex="2">Some Text 2</a>
```

■ Anchor "Link" Colors

- Link can have different colors according to its state
 - Link - standard link color in document
 - Active - Link target is active in another window
 - Visited - Links has been visited by the user
 - Hover - Mouse cursor is positioned over the link

The Link Tag

- Can be used to provide additional information on a document
- Has to be placed within the head element of a page
- Has no matching close tag
- There is no text encapsulated and thus nothing is rendered/displayed

Example

```
<head>  
<link rel="stylesheet"  
type="text/css" href="theme.css" />  
</head>
```


HTML5 & CSS3 Demos



- <http://html5demos.com/>
- <http://diveintohtml5.info/detect.html#geolocation>
- <http://alteredqualia.com/canvasmol/#Aspirin>

- <http://daneden.github.io/animate.css/>
- <https://developer.mozilla.org/de/demos/tag/tech:css3>

Exercises 2.3+2.4