

COMPSCI 111/111G SS2020



HTML5

Markup Languages

Heading

Paragraph **Formatting** Plain text contains all the content which will appear on the page.

Using a variety of formatting styles makes the text much easier to read and can be used to emphasise points.

Emphasise

Markup Tags (HTML)

```
<H1>Formatting.</H1> Plain text contains all the content which will appear on the page.  
<P> Using a variety of formatting styles makes the text much <EM>easier to read</EM> and can be used to <EM>emphasise points.</EM>
```

Formatting

Plain text contains all the content which will appear on the page.

Final Appearance

Using a variety of formatting styles makes the text much *easier to read* and can be used to *emphasise points*.

Markup Languages

- **Markup**
 - Indicates the formatting that should be used to display the page
- **Markup Language**
 - A markup language consists of special tags which are placed in the text
 - Specifies how to format the text
- **Hypertext Markup Language (HTML)**
 - Used to format web pages
 - Contains hypertext information (links)
 - Written in ASCII / Unicode
 - Embedded format codes (tags)

Browser Wars

- **HTML 1.0**
 - Tim Berners Lee (1993)
- **Browsers added extra features**
 - Internet Explorer had unique tags
 - Netscape Navigator had unique tags
- **Major problem**
 - What tags should a publisher use?
 - How can this problem be resolved?

Development of HTML

- **HTML 2.0**
 - Internet Engineering Task Force standard (1995)
- **HTML 3.2 / HTML 4.0**
 - W3 Consortium recommendation (1997)
- **HTML 4.01**
 - W3C recommendation (1999)
- **XHTML 1.0**
 - W3C recommendation (2000)
- **HTML5**
 - Fifth revision of HTML standard. Standardized October 2014.

Document Type Definition

- **Defines which standard is being used for the page**
 - We use HTML5
- **Should appear at the top of the file**

```
<!DOCTYPE html>
```

Encoding methods

- **Different character sets used to encode the page**
 - ASCII
 - UTF-8
 - Unicode
- **Need to tell the browser which encoding is used**
 - Located in the *head* of the document.

```
<meta charset="UTF-8">
```

Use at the start of every file

- **Copy and paste the code exactly as it appears**
 - Will be provided in tests and exams

```
<!DOCTYPE html>  
<html>  
<head>  
<meta charset="UTF-8">  
</head>
```


HTML Source Code

- **Code used by the browser to display the page**
 - White space is ignored
- **Comments**
 - Ignored by the browser
 - Allow you to document your code
 - `<!-- Put your comment here -->`
- **Layout**
 - Use tidy layout where possible
 - Make code easy to understand
 - Make code easy to maintain/modify
 - Use whitespace and comments to help

Overview of tags

- **Markup achieved with “tags”**
 - Enclosed with angle brackets < ... >
 - Use lower case
 - Most come in pairs <tag> ... </tag>
- **Tag usually applies to text between start and end tag**

This word is in `italics`

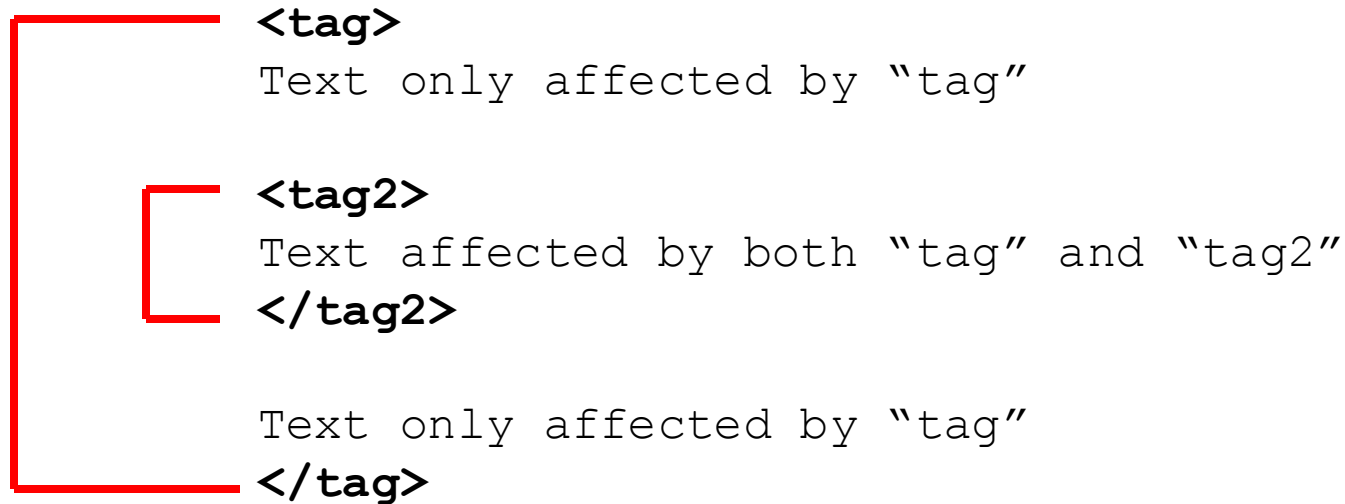


Attributes

- **Some tags require additional information**
 - Properties or attributes of the tag
 - `<tag property="value"> </tag>`

Nested Tags

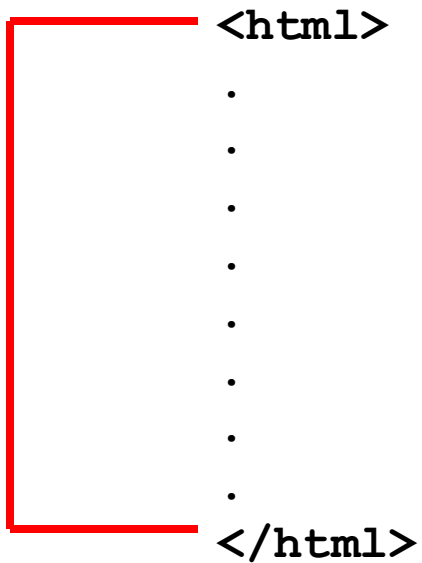
- **Tags must be correctly nested**
 - Cannot close an open tag until all the open tags that it affects are also closed



Essential tags

`<html>`

- Encloses the entire document
- Specifies that the document uses html



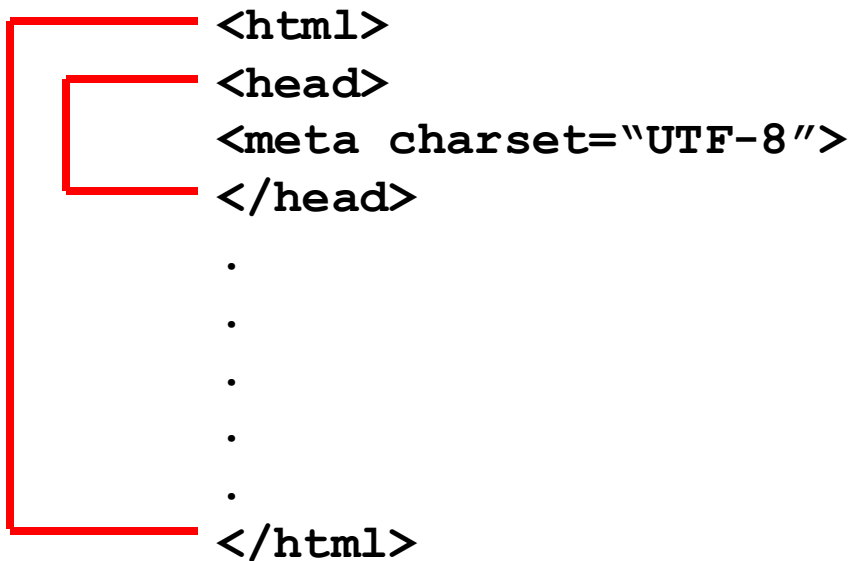
A diagram illustrating the `<html>` tag. A red bracket on the left side connects the opening tag `<html>` at the top to the closing tag `</html>` at the bottom. Inside the bracket, there is a vertical list of eight dots, representing the content enclosed by the `<html>` tag.

Essential tags

<head>

- Contains information for the browser
 - E.g. character encoding used
- Does not contain any content to be displayed on the page

```
<html>  
  <head>  
    <meta charset="UTF-8">  
  </head>  
  .  
  .  
  .  
  .  
  .  
</html>
```

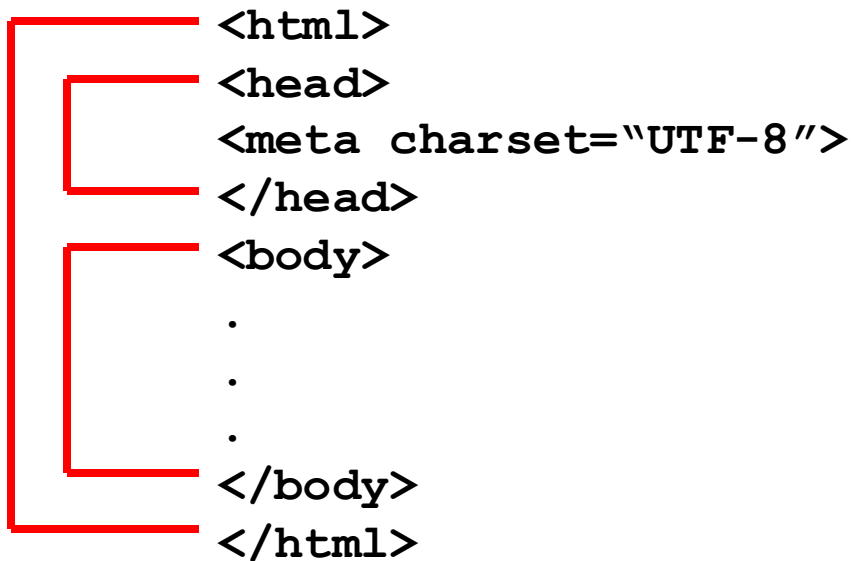
A diagram illustrating the structure of an HTML document. It shows a list of HTML tags: <html>, <head>, <meta charset="UTF-8">, </head>, five dots representing other content, and </html>. Red brackets are drawn to show the nesting: an outer bracket groups <html> and </html>, and an inner bracket groups <head> and </head>.

Essential tags

<body>

- Contains all the content that will appear on the page

```
<html>  
  <head>  
    <meta charset="UTF-8">  
  </head>  
  <body>  
    .  
    .  
    .  
  </body>  
</html>
```

A diagram illustrating the structure of an HTML document. It shows a list of HTML tags: <html>, <head>, <meta charset="UTF-8">, </head>, <body>, three dots, </body>, and </html>. Red brackets are drawn on the left side of the tags to show their nesting. A large bracket on the left side of the entire list indicates that all these tags are contained within the <html> root element. A smaller bracket on the left side of the <head>, <meta>, and </head> tags indicates they are contained within the <head> element. Another smaller bracket on the left side of the <body>, three dots, and </body> tags indicates they are contained within the <body> element.

Essential tags

`<title>`

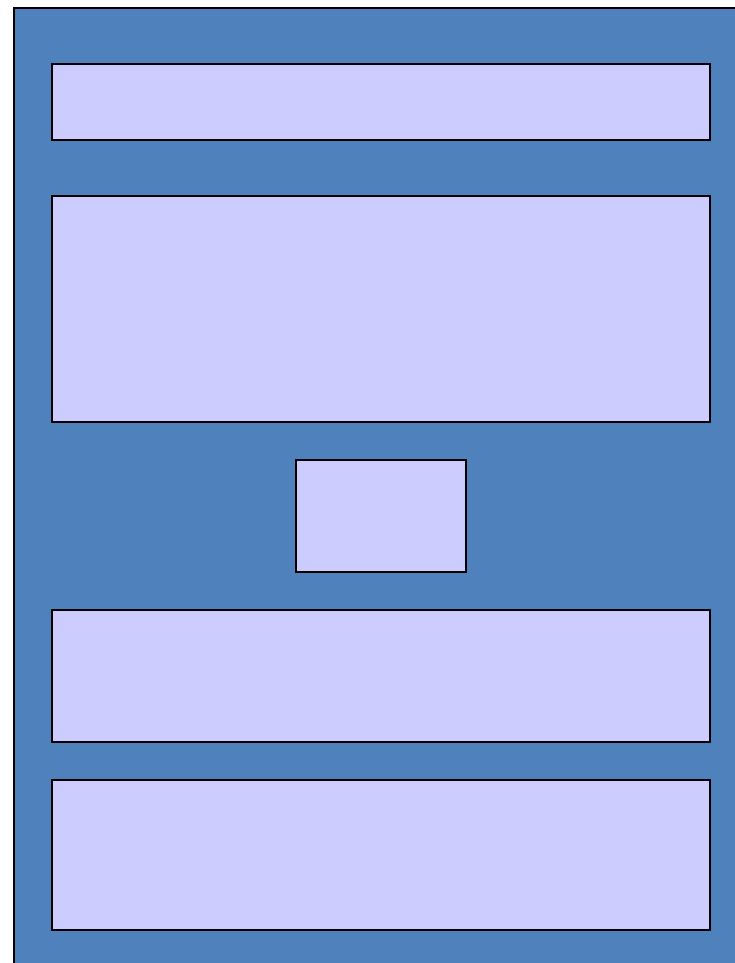
- Part of the head
- Specifies the title to be used by the browser
- Name of the window
- Used in navigation (bookmarks, history, etc.)

```
<html>  
  <head>  
    <meta charset="UTF-8">  
    <title>Introduction to tags</title>  
  </head>  
  <body>  
    .  
    .  
    .  
  </body>  
</html>
```


Block-level tags

Define the structure of a “block”

- Headings
- Paragraphs
- Lists
- Tables
- Preformatted text



Paragraphs

`<p>`

- Defines a paragraph of text

```
<html>
<head>
<meta charset="UTF-8">
<title>Introduction to tags</title>
</head>
<body>
<p>This is a very simple web page</p>
<p>
It contains two different paragraphs
of text.
</p>
</body>
</html>
```



Exercises

Exercise 1: What does HTML stand for?

Exercise 2: What is a document type definition used for?

Exercise 3: What is “white space”?

Exercise 4: Is HTML case sensitive? What about XHTML?

Exercises

Exercise 5: Create a complete HTML document with the title “Simple page”. The only text that should appear on the page is “Hello World”.

Headings

Six levels of headings

- `<h1>` First level heading
- `<h2>` Second level heading
- `<h3>` Third level heading
- `<h4>` Fourth level heading
- `<h5>` Fifth level heading
- `<h6>` Sixth level heading

Headings

```
<html>
<head>
<meta charset="UTF-8">
<title>Introduction to tags</title>
</head>
<body>
<h1>A very simple web page</h1>
<p>It contains two paragraphs and two
headings</p>
<h2>Second section</h2>
<p>This section is less important</p>
</body>
</html>
```

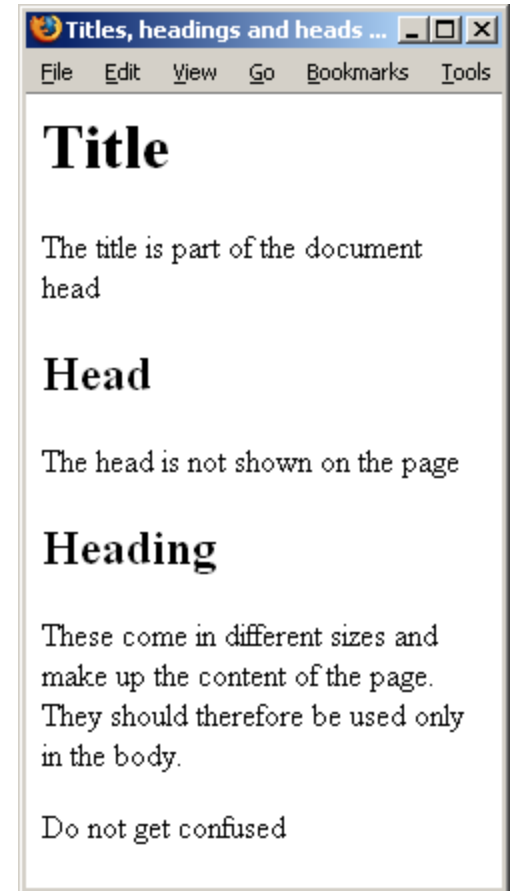


Example of Head, Heading and Title

```
<html>
<head>
<meta charset="UTF-8">
<title> Titles, headings and heads</title></head>
<body>
  <h1>Title</h1>
  <p>The title is part of the document head</p>

  <h2>Head</h2>
  <p>The head is not shown on the page</p>

  <h2>Heading</h2>
  <p>These come in different sizes
and make up the content of the page.
They should therefore be used only
in the body.</p>
  <p>Do not get confused</p>
</body>
</html>
```

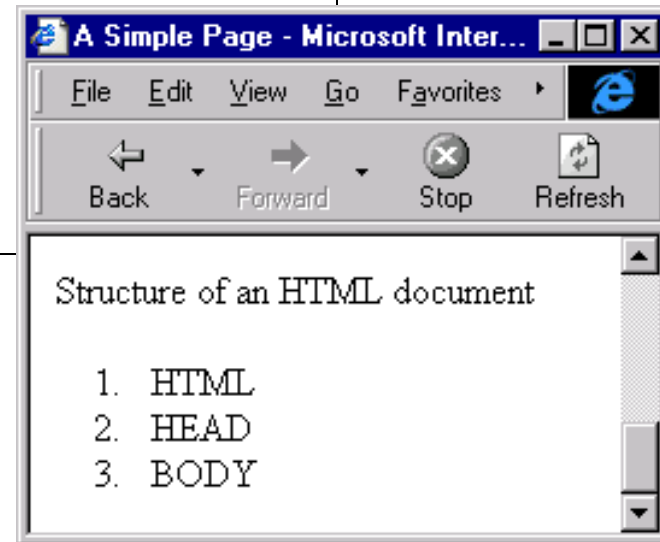


Ordered Lists

Ordered Lists

- Automatically numbered
- ` ... ` Contains the entire list
- ` ... ` Used for each list item

```
<p>Structure of an HTML document</p>  
<ol>  
<li>HTML</li>  
<li>HEAD</li>  
<li>BODY</li>  
</ol>
```

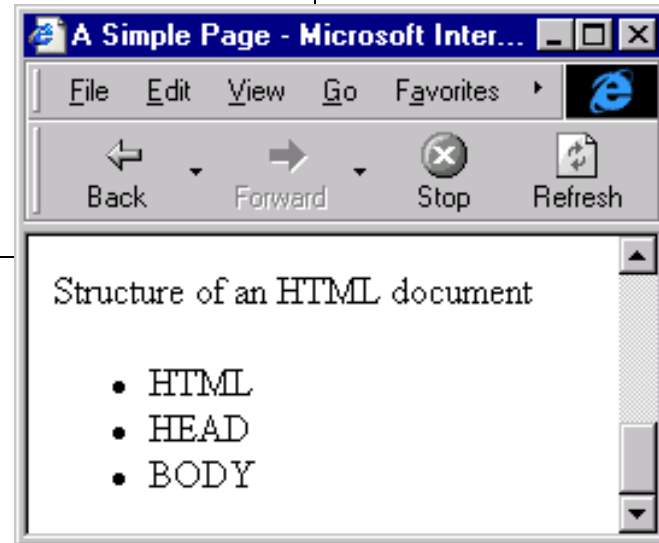


Unordered Lists

Unordered Lists

- Bullet Points
- ` ... ` Contains the entire list
- ` ... ` Used for each list item

```
<p>Structure of an HTML document</p>  
<ul>  
<li>HTML</li>  
<li>HEAD</li>  
<li>BODY</li>  
</ul>
```

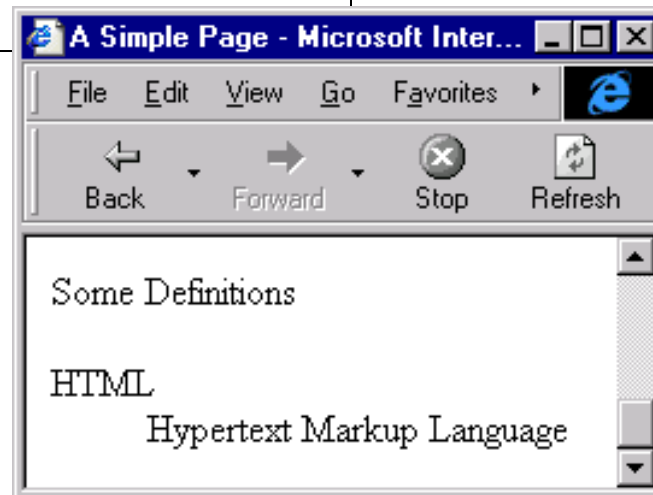


Definition Lists

Terms and explanations

- `<d1> ... </d1>` Contains the entire list
- `<dt> ... </dt>` A definition term
- `<dd> ... </dd>` A definition description

```
<p>Some definitions</p>  
<d1>  
<dt>HTML</dt>  
<dd>Hypertext Markup Language</dd>  
</d1>
```



Inline tags

- **Appear within the blocks**
 - Apply to words within paragraphs etc.
- **Common inline tags**
 - Line Breaks
 - Images
 - Hypertext References

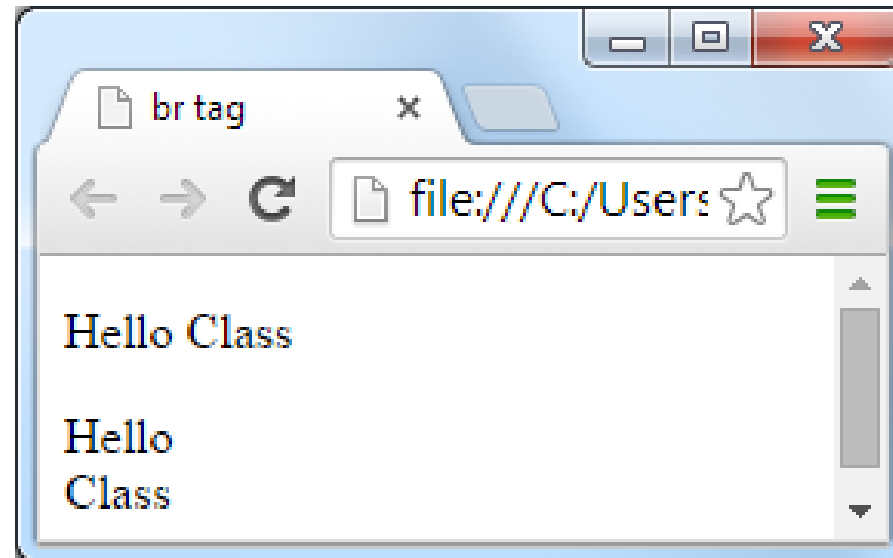
Empty tags

- **Tags that apply at a given point**
 - Do not format content
 - Only the opening tag is required.
- **Line breaks**
 - `
`
- **Images**
 - ``

Line break

- **Breaks a line**
 - Same as hitting the Enter key
 - Use `
`

```
<p>Hello Class</p>  
<p>Hello<br>Class</p>
```



Images

- **Pages may contain images**
 - But images are not plain text
 - Can't be inserted directly into HTML page
- **Solution**
 - Store the image on the internet (or locally on disk)
 - Tag contains the address of the image
 - Web browser loads image when required
 - Only use images the browser understands
 - GIF, JPG, PNG

Image tag

``

- Insert an image at this location

`src`

- The source file of the image
- Attribute that specifies the file name

`alt`

- Attribute to specify alternate text
- Displayed if the image can't load
- Important for people with visual impairment

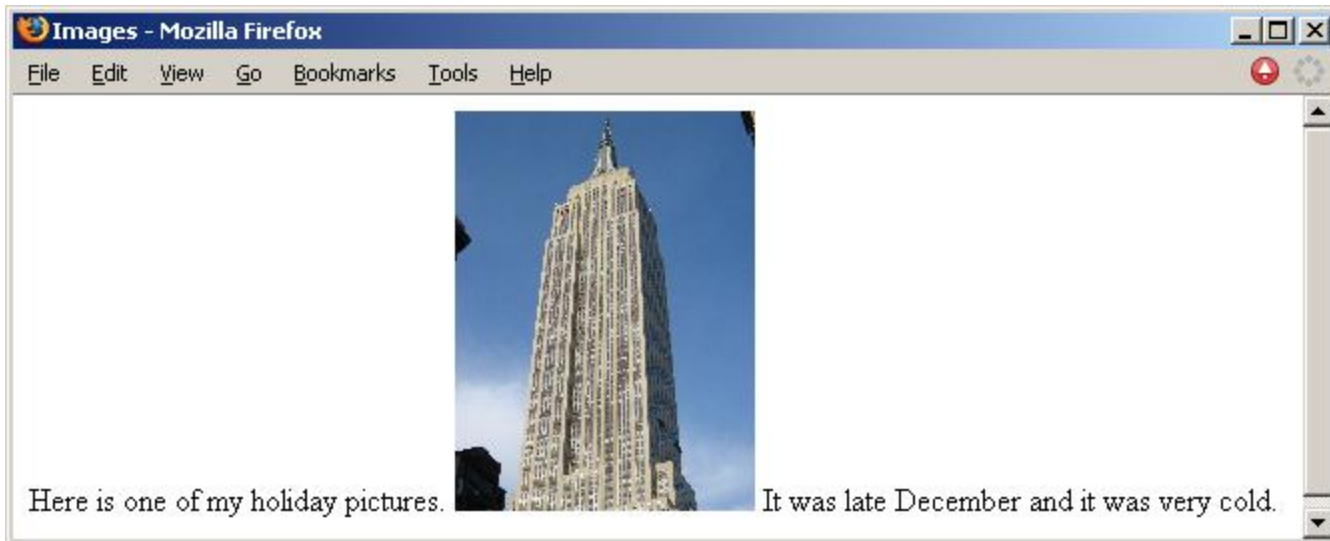
```

```

 example

An image is inserted inline, so it is used inside a block-level element (a paragraph in this example).

```
<p>  
Here is one of my holiday pictures.  
  
It was late December and it was very cold.  
</p>
```



Hypertext reference

A link to another resource on the WWW

- References to other documents
- Pages, images, files, sections

<a>

- Anchor tag

href

- Attribute used to specify the destination of the link
- URL

text appearing

URLs

Fully specified

- Protocol
- Host name
- Path
- File

Relative

- Omit the first parts
- Path and file
- File

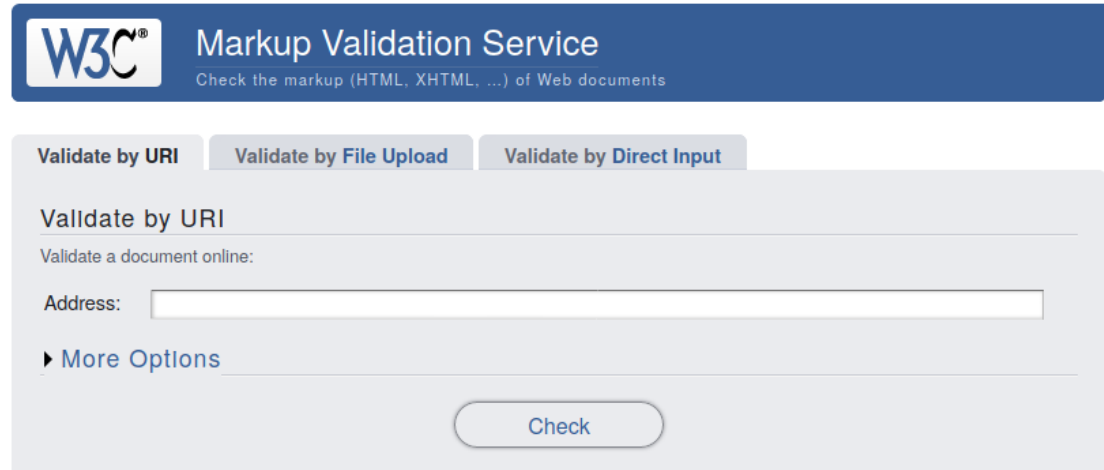
```
http://www.cs.auckland.ac.nz/courses/compsci111/index.html  
/couses/compsci111/index.html  
lectures/index.html  
index.html
```

Exercise

Exercise 6: What HTML code is required to create a hypertext reference that links to a page at the location ["http://www.cs.auckland.ac.nz/courses/compsci111/"](http://www.cs.auckland.ac.nz/courses/compsci111/). The underlined link on the page should be the text "111 home page".

Validated Code

- **Online system to check correctness of code**
 - Provided by W3C
 - <http://validator.w3.org>



The screenshot shows the W3C Markup Validation Service interface. At the top, there is 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 three tabs: "Validate by URI", "Validate by File Upload", and "Validate by Direct Input". The "Validate by URI" tab is selected. Underneath, there is a section titled "Validate by URI" with the instruction "Validate a document online:". Below this, there is a label "Address:" followed by a text input field. A blue link "More Options" is positioned below the input field. At the bottom of the form, there is a "Check" button.

This validator checks the [markup validity](#) of Web documents in HTML, XHTML, SMIL, MathML, etc. If you wish to validate specific content such as [RSS/Atom feeds](#) or [CSS stylesheets](#), [MobileOK content](#), or to [find broken links](#), there are [other validators and tools](#) available. As an alternative you can also try our [non-DTD-based validator](#).



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Example source code

```
<!DOCTYPE html>

<html lang="en">

<head>
<meta charset="UTF-8">
<title>A sample page</title>
</head>

<body>
<h1>Example</h1>
<p>This is a complete html5 web page. You can verify that all
the code is correct using the
<a href="http://validator.w3.org">W3C Validator</a>.</p>

<h2>Images</h2>
<p>If your code is correct, then you can include an image to
show that the page is validated.</p>
<p>Date: 4 Feb 2020</p>
<p></p>

</body>

</html>
```

Example page

