CSIT884:
Web Development

HTML

School of Computing and Information Technology
University of Wollongong

HTML

- HTML is a markup language for describing web documents

   used to mark parts of documents to indicate how they
   should appear on a display

- HTML stands for **H**yper **T**ext **M**arkup **L**anguage

- HTML documents are described by **HTML tags**

- Each HTML tag describes different document content

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The first HTML document

```
<html>

  <head>

    <title>Hi</title>

  </head>

  <body>

    Hello World!

  </body>

</html>
```
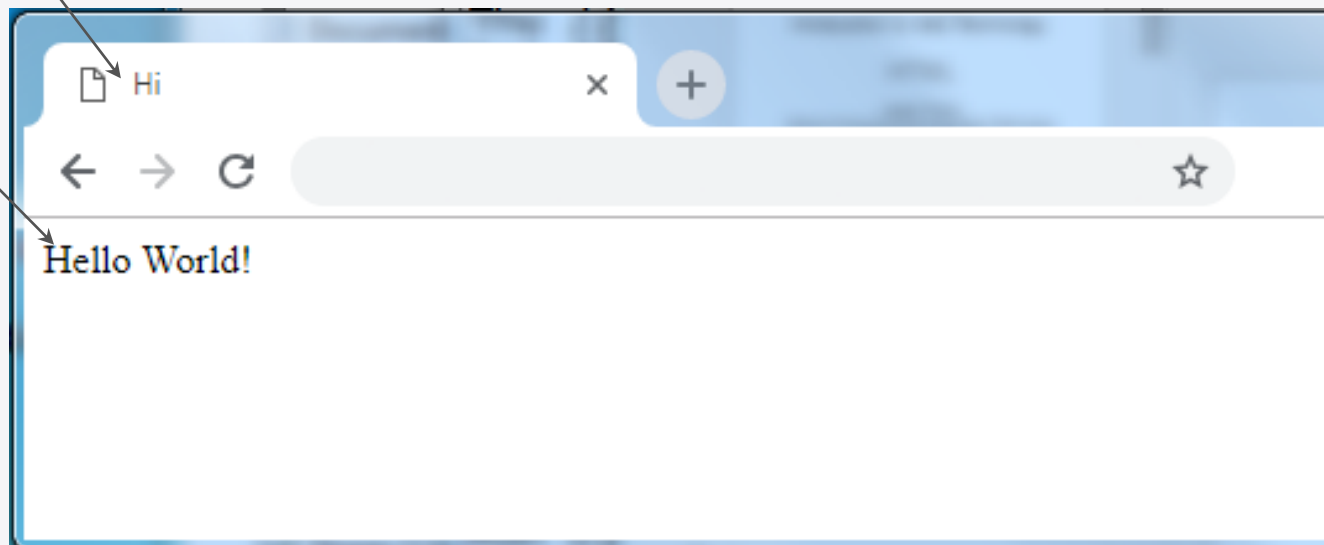
The first HTML document

```
<html>

  <head>

    <title>Hi</title>

  </head>

  <body>

    Hello World!

  </body>

</html>
```

HTML document structure

```
<html>

  <head>

    <title>Hi</title>

  </head>

  <body>

    Hello World!

  </body>

</html>
```
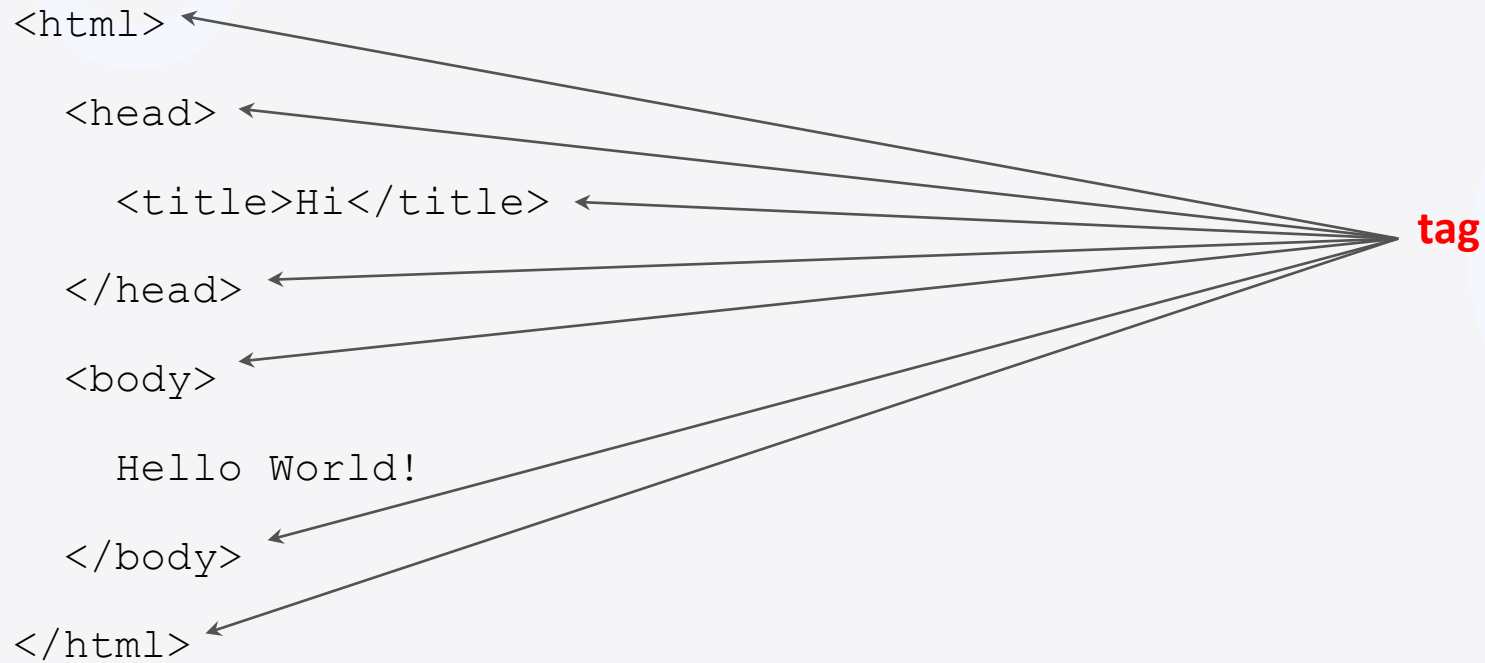
- A HTML document starts with **<html>** and ends with **</html>**

- A HTML document has a **head** and a **body**

- The visible part of the HTML document is between <body> and </body>

HTML tags

```
<html>
   <head>
      <title>Hi</title>
   </head>
   <body>
      Hello World!
   </body>
</html>
```

tag

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HTML tags

```
<html>

   <head>

     <title>Hi</title>

   </head>

   <body>

      Hello World!

   </body>

</html>
```

tags are NOT case sensitive

tag

most tags are in pair

`<tagname>content</tagname>`

start tag

end tag

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HTML tags

```
<html>

  <head>

    <title>Hi</title>

  </head>

  <body>

    Hello World!

  </body>

</html>
```

HTML **documents** are made up by HTML **elements**.

The HTML **element** is everything from the start tag to the end tag.

Where is the HTML element?
Where is the HEAD element?
Where is the BODY element?
Where is the TITLE element?

What elements does the HTML element contain?

Self-closing tag

`<tagname></tagname>`

- Sometime we have an element with no content (**an empty element**)
- With an empty element, we can combine the start-tag and end-tag into one

  self-closing tag: `<tagname />`

- Example:
  - **\<br /\>** tag defines a line break

  - **\<hr /\>** tag defines a horizontal line

  - **\<img** `src="..." alt="..."` **/\>** tag defines an image

Tag attributes

```
<tagname attribute1="value1" attribute2="value2">
 ...
</tagname>
```

- HTML elements can have **attributes**

- Attributes provide **additional information** about an element

- Attributes are always specified in the **start tag**

- Attributes come in name/value pairs like: **name="value"**

Heading tags

```
<body>

<h1>Heading 1</h1>

<h2>Heading 2</h2>

<h3>Heading 3</h3>

<h6>Heading 6</h6>

Normal text...

</body>
```

Heading tags: <h1>, <h2>,..., <h6>

<h1> the most important heading

<h6> the least important heading

Unordered List

```
My timetable:

<ul>

  <li>MATH222: Mon 8:30-10:30 lecture</li>

  <li>CSCI204: Tue 9:30-11:30 lab</li>

  <li>ISIT206: Wed 8:30-10:30 lecture</li>

</ul>
```

My timetable:

- MATH222: Mon 8:30-10:30 lecture
- CSCI204: Tue 9:30-11:30 lab
- ISIT206: Wed 8:30-10:30 lecture

Unordered List

Unordered List

List Item

```
My timetable:

<ul>

   <li>MATH222: Mon 8:30-10:30 lecture</li>

   <li>CSCI204: Tue 9:30-11:30 lab</li>

   <li>ISIT206: Wed 8:30-10:30 lecture</li>

</ul>
```

My timetable:

- MATH222: Mon 8:30-10:30 lecture
- CSCI204: Tue 9:30-11:30 lab
- ISIT206: Wed 8:30-10:30 lecture

Ordered List

```
My timetable:

<ol>

    <li>MATH222: Mon 8:30-10:30 lecture</li>

    <li>CSCI204: Tue 9:30-11:30 lab</li>

    <li>ISIT206: Wed 8:30-10:30 lecture</li>

</ol>
```

My timetable:

1. MATH222: Mon 8:30-10:30 lecture
2. CSCI204: Tue 9:30-11:30 lab
3. ISIT206: Wed 8:30-10:30 lecture

Ordered List

My timetable:

`<`**`ol`**`>` ← **O**rdered **L**ist

  `<`**`li`**`>`MATH222: Mon 8:30-10:30 lecture`</`**`li`**`>` ← **L**ist **I**tem

  `<li>`CSCI204: Tue 9:30-11:30 lab`</li>`

  `<li>`ISIT206: Wed 8:30-10:30 lecture`</li>`

`</`**`ol`**`>`

My timetable:

1. MATH222: Mon 8:30-10:30 lecture
2. CSCI204: Tue 9:30-11:30 lab
3. ISIT206: Wed 8:30-10:30 lecture

Description List

My timetable:

```
<dl>

    <dt>MATH222</dt>

    <dd>Mon 8:30-10:30 lecture</dd>


    <dt>CSCI204</dt>

    <dd>Tue 9:30-11:30 lab</dd>


    <dt>ISIT206</dt>

    <dd>Wed 8:30-10:30 lecture</dd>

</dl>
```

My timetable:

MATH222
      Mon 8:30-10:30 lecture

CSCI204
      Tue 9:30-11:30 lab

ISIT206
      Wed 8:30-10:30 lecture

Description List

My timetable:

```
<dl>

   <dt>MATH222</dt>

   <dd>Mon 8:30-10:30 lecture</dd>


   <dt>CSCI204</dt>

   <dd>Tue 9:30-11:30 lab</dd>


   <dt>ISIT206</dt>

   <dd>Wed 8:30-10:30 lecture</dd>

</dl>
```

Description **L**ist

Description **T**erm

Description **D**efinition

My timetable:

MATH222
  Mon 8:30-10:30 lecture

CSCI204
  Tue 9:30-11:30 lab

ISIT206
  Wed 8:30-10:30 lecture

Formatting text

```
<i>italic text</i> <br />

<b>bold text</b> <br />

<mark>highlighted text</mark> <br />

<del>deleted text</del> <br />

<ins>inserted text</ins>
```

Formatting text

```html
<ins>My timetable:</ins>

<ul>

  <li><b>MATH222</b>: Mon 8:30-10:30 <i>lecture</i></li>

  <li><b>CSCI204</b>: Tue 9:30-11:30 <i>lab</i></li>

  <li><b>ISIT206</b>: Wed 8:30-10:30 <i>lecture</i></li>

</ul>
```
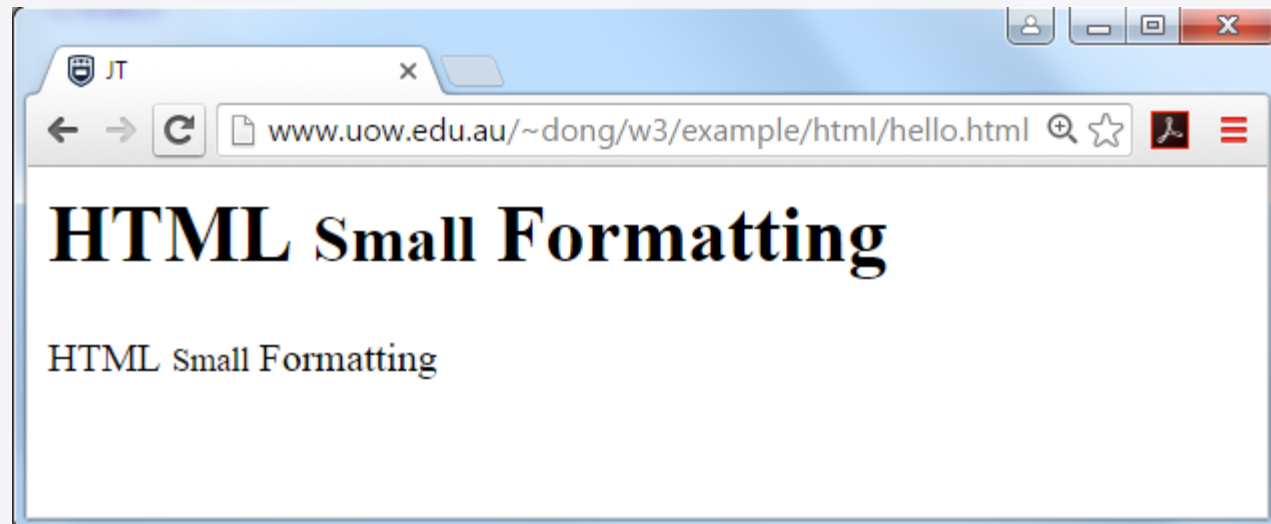
<u>My timetable:</u>

- **MATH222**: Mon 8:30-10:30 *lecture*
- **CSCI204**: Tue 9:30-11:30 *lab*
- **ISIT206**: Wed 8:30-10:30 *lecture*

Formatting text

```
<h1>HTML <small>Small</small> Formatting</h1>

HTML <small>Small</small> Formatting
```

Formatting text

```
<body>

Some math

x<sub>1</sub><sup>n</sup> +
x<sub>2</sub></sub><sup>n</sup> =
y<sub>1</sub><sup>n</sup> +
y<sub>2</sub><sup>n</sup>

</body>
```
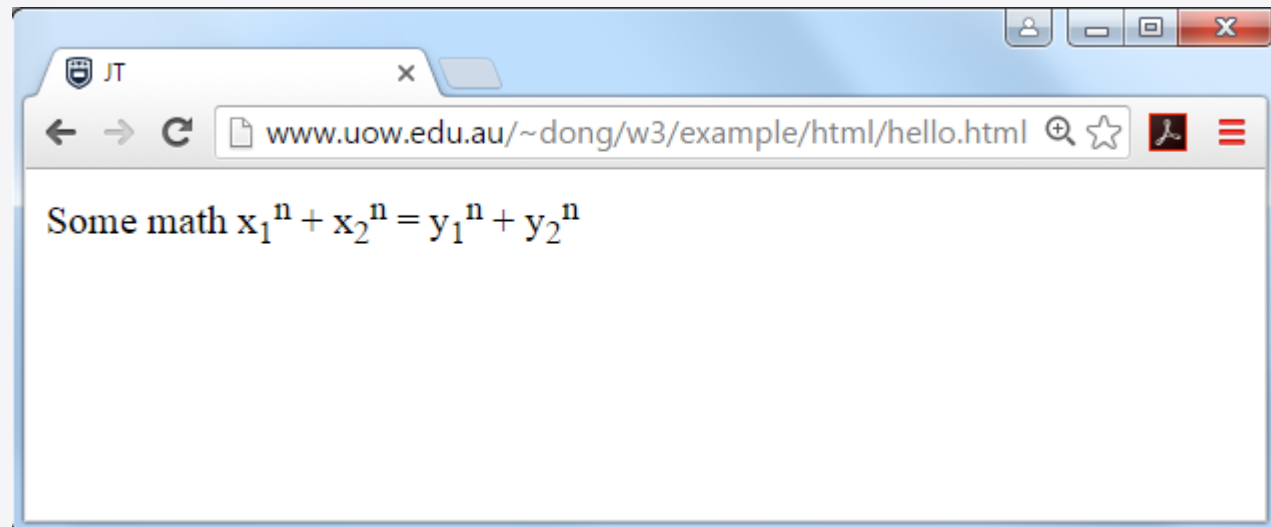
Some math $x_1^n + x_2^n = y_1^n + y_2^n$

Formatting text

Changing font

```
<font size="1">This is the smallest size</font>

<font size="2">smaller than the default</font>

<font size="3">This is the default font size</font>

<font size="4">larger than the default</font>

<font size="5">larger than the default</font>

<font size="6" color="red">larger than the default</font>

<font size="7" color="blue">This is the largest size</font>
```

Table

border attribute

```
<table border="1">
  <tr>
    <th>Username</th>
    <th>First name</th>
    <th>Last name</th>
  </tr>
  <tr>
    <td>jsmith</td>
    <td>John</td>
    <td>Smith</td>
  </tr>
  <tr>
    <td>mlee</td>
    <td>Mary</td>
    <td>Lee</td>
  </tr>
</table>
```
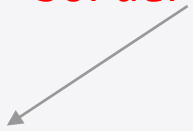
Username	First name	Last name
jsmith	John	Smith
mlee	Mary	Lee

Turn off the border: `border="0"`

Username	First name	Last name
jsmith	John	Smith
mlee	Mary	Lee

Table

```
<table border="1">
  <tr>                          ← Table Row
    <th>Username</th>
    <th>First name</th>          row 1
    <th>Last name</th>
  </tr>
  <tr>
    <td>jsmith</td>
    <td>John</td>               row 2
    <td>Smith</td>
  </tr>
  <tr>
    <td>mlee</td>
    <td>Mary</td>               row 3
    <td>Lee</td>
  </tr>
</table>
```

Username	First name	Last name
jsmith	John	Smith
mlee	Mary	Lee

Table

```
<table border="1">
   <tr>
      <th>Username</th>
      <th>First name</th>
      <th>Last name</th>
   </tr>
   <tr>
      <td>jsmith</td>
      <td>John</td>
      <td>Smith</td>
   </tr>
   <tr>
      <td>mlee</td>
      <td>Mary</td>
      <td>Lee</td>
   </tr>
</table>
```

Table **H**eader

Table **D**ata

Username	First name	Last name
jsmith	John	Smith
mlee	Mary	Lee

Table

```
<table border="1">
  <tr>
    <td>jsmith</td>
    <td>John</td>
    <td>Smith</td>
  </tr>
  <tr>
    <td>mlee</td>
    <td>Mary</td>
    <td>Lee</td>
  </tr>
</table>
```
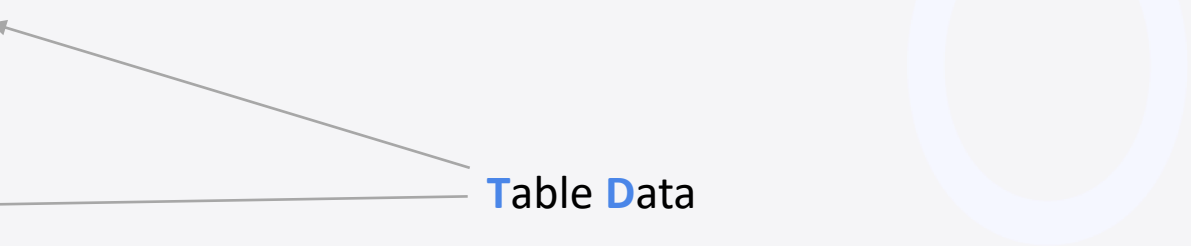
Sometimes we do not need table header

Table **D**ata

jsmith	John	Smith
mlee	Mary	Lee

Table

```html
<table border="1" width="50%">
  <caption>User information</caption>
  <tr>
    <th width="20%">Username</th>
    <th width="40%">First name</th>
    <th width="40%">Last name</th>
  </tr>
  <tr>
    <td align="center">jsmith</td>
    <td align="right">John</td>
    <td align="right">Smith</td>
  </tr>
  <tr>
    <td align="center">mlee</td>
    <td align="right">Mary</td>
    <td align="right">Lee</td>
  </tr>
</table>
```

Table caption

User information		
Username	**First name**	**Last name**
jsmith	John	Smith
mlee	Mary	Lee

Table

```
<table border="1" width="50%">
  <caption>User information</caption>
  <tr>
    <th width="20%">Username</th>
    <th width="40%">First name</th>
    <th width="40%">Last name</th>
  </tr>
  <tr>
    <td align="center">jsmith</td>
    <td align="right">John</td>
    <td align="right">Smith</td>
  </tr>
  <tr>
    <td align="center">mlee</td>
    <td align="right">Mary</td>
    <td align="right">Lee</td>
  </tr>
</table>
```

Table width within the page

Column width within the table

User information		
Username	**First name**	**Last name**
jsmith	John	Smith
mlee	Mary	Lee

Table

```
<table border="1">
  <caption>User information</caption>
  <tr>
    <th width="150px">Username</th>
    <th width="200px">First name</th>
    <th width="200px">Last name</th>
  </tr>
  <tr>
    <td align="center">jsmith</td>
    <td align="right">John</td>
    <td align="right">Smith</td>
  </tr>
  <tr>
    <td align="center">mlee</td>
    <td align="right">Mary</td>
    <td align="right">Lee</td>
  </tr>
</table>
```

Column width using pixels

User information		
Username	**First name**	**Last name**
jsmith	John	Smith
mlee	Mary	Lee

Table

```html
<table border="1" width="50%">
  <caption>User information</caption>
  <tr>
    <th width="20%">Username</th>
    <th width="40%">First name</th>
    <th width="40%">Last name</th>
  </tr>
  <tr>
    <td align="center">jsmith</td>
    <td align="right">John</td>
    <td align="right">Smith</td>
  </tr>
  <tr>
    <td align="center">mlee</td>
    <td align="right">Mary</td>
    <td align="right">Lee</td>
  </tr>
</table>
```

Horizontal alignment

User information		
Username	**First name**	**Last name**
jsmith	John	Smith
mlee	Mary	Lee

Table

```
<table width="50%" border="1">
  <tr>
    <td valign="middle">jsmith</td>
    <td>
     John Smith <br />
     DOB: 23/01/2000 <br />
     Course code: 875
    </td>
  </tr>
  <tr>
    <td valign="middle">mlee</td>
    <td>
     Mary Lee <br />
     DOB: 15/04/2001 <br />
     Course code: 741
    </td>
  </tr>
</table>
```

Vertical alignment

jsmith	John Smith DOB: 23/01/2000 Course code: 875
mlee	Mary Lee DOB: 15/04/2001 Course code: 741

Table

```
<table width="50%" border="1">
  <tr>
    <td valign="top">jsmith</td>
    <td>
     John Smith <br />
     DOB: 23/01/2000 <br />
     Course code: 875
    </td>
  </tr>
  <tr>
    <td valign="top">mlee</td>
    <td>
     Mary Lee <br />
     DOB: 15/04/2001 <br />
     Course code: 741
    </td>
  </tr>
</table>
```
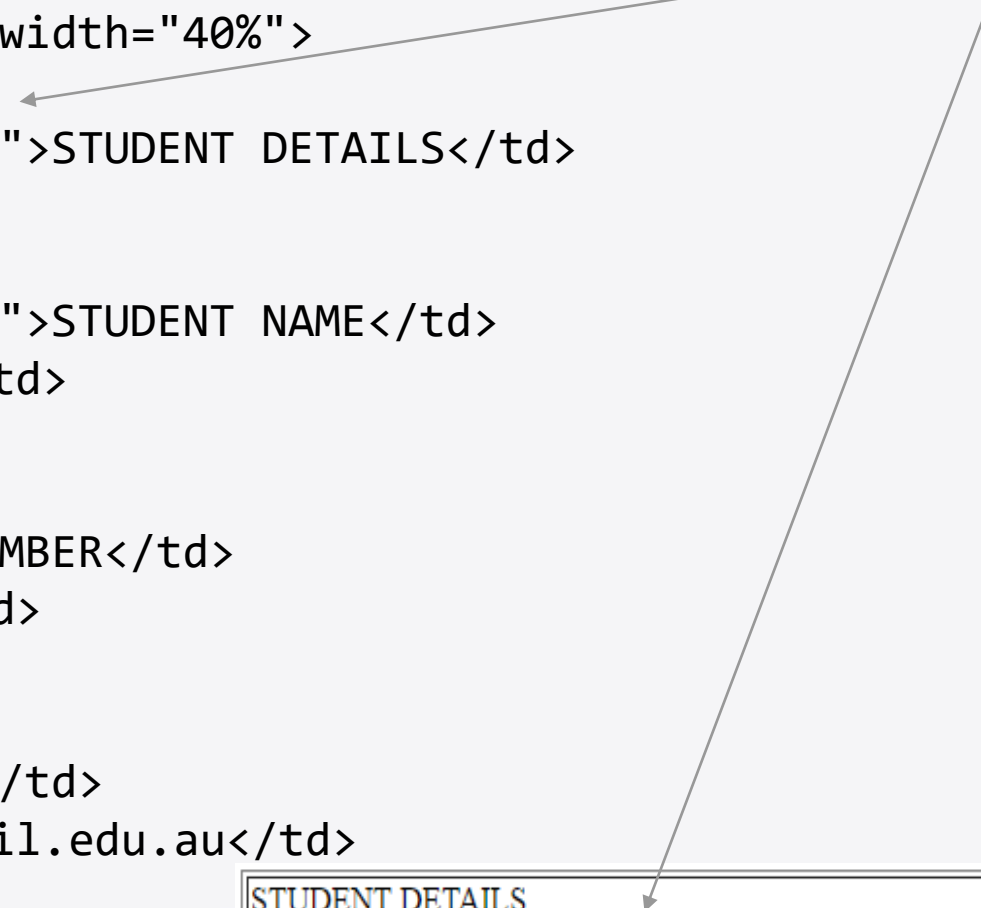
Vertical alignment

jsmith	John Smith DOB: 23/01/2000 Course code: 875
mlee	Mary Lee DOB: 15/04/2001 Course code: 741

Table

```
<table width="50%" border="1">
  <tr>
    <td valign="bottom">jsmith</td>
    <td>
     John Smith <br />
     DOB: 23/01/2000 <br />
     Course code: 875
    </td>
  </tr>
  <tr>
    <td valign="bottom">mlee</td>
    <td>
     Mary Lee <br />
     DOB: 15/04/2001 <br />
     Course code: 741
    </td>
  </tr>
</table>
```

Vertical alignment

	John Smith DOB: 23/01/2000 Course code: 875
jsmith	
	Mary Lee DOB: 15/04/2001 Course code: 741
mlee	

Table

```
<table border="1" width="40%">
  <tr>
    <td colspan="2">STUDENT DETAILS</td>
  </tr>
  <tr>
    <td width="30%">STUDENT NAME</td>
    <td>John Lee</td>
  </tr>
  <tr>
    <td>STUDENT NUMBER</td>
    <td>1234567</td>
  </tr>
  <tr>
    <td>UOW EMAIL</td>
    <td>jlee@uowmail.edu.au</td>
  </tr>
</table>
```

STUDENT DETAILS	
STUDENT NAME	John Lee
STUDENT NUMBER	1234567
UOW EMAIL	jlee@uowmail.edu.au

Table

```
<table border="1" width="50%">
  <tr>
    <td></td>
    <td>Monday</td>
    <td>Tuesday</td>
    <td>Wednesday</td>
  </tr>

  <tr>
    <td>8:30-9:30</td>
    <td rowspan="2">MATH 321 lecture</td>
    <td>INFO 104 lecture</td>
    <td>CS 222 lecture</td>
  </tr>

  <tr>
    <td>9:30-10:30</td>
    <td>CS 222 Lab</td>
    <td rowspan="2">MATH 321 tutorial</td>
  </tr>

  <tr>
    <td>10:30-11:30</td>
    <td>CS 222 lecture</td>
    <td>INFO 104 tutorial</td>
  </tr>
</table>
```
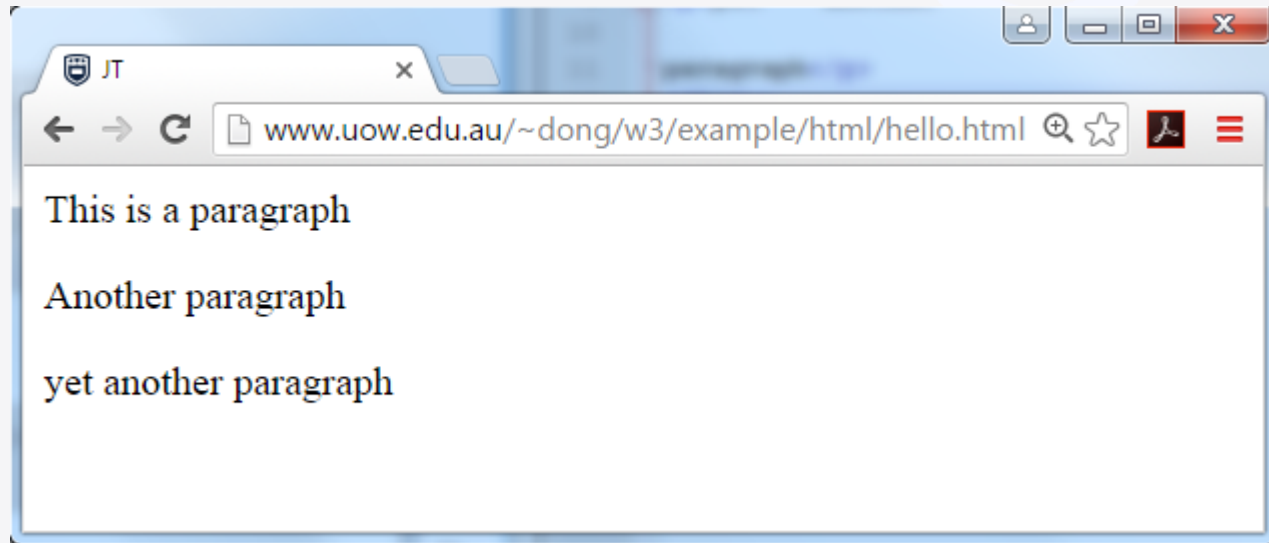
	Monday	Tuesday	Wednesday
8:30-9:30	MATH 321 lecture	INFO 104 lecture	CS 222 lecture
9:30-10:30		CS 222 Lab	MATH 321 tutorial
10:30-11:30	CS 222 lecture	INFO 104 tutorial	

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Paragraph tag <p>

```
<p>This   is a paragraph</p>

<p>Another

paragraph</p>

<p>yet      another


paragraph</p>
```

Extra spaces and lines will NOT be displayed in paragraph

Line break

```
<p>This  is a paragraph</p>

<p>Another <br />

paragraph</p>

<p>yet    another <br />

<br />

paragraph</p>
```
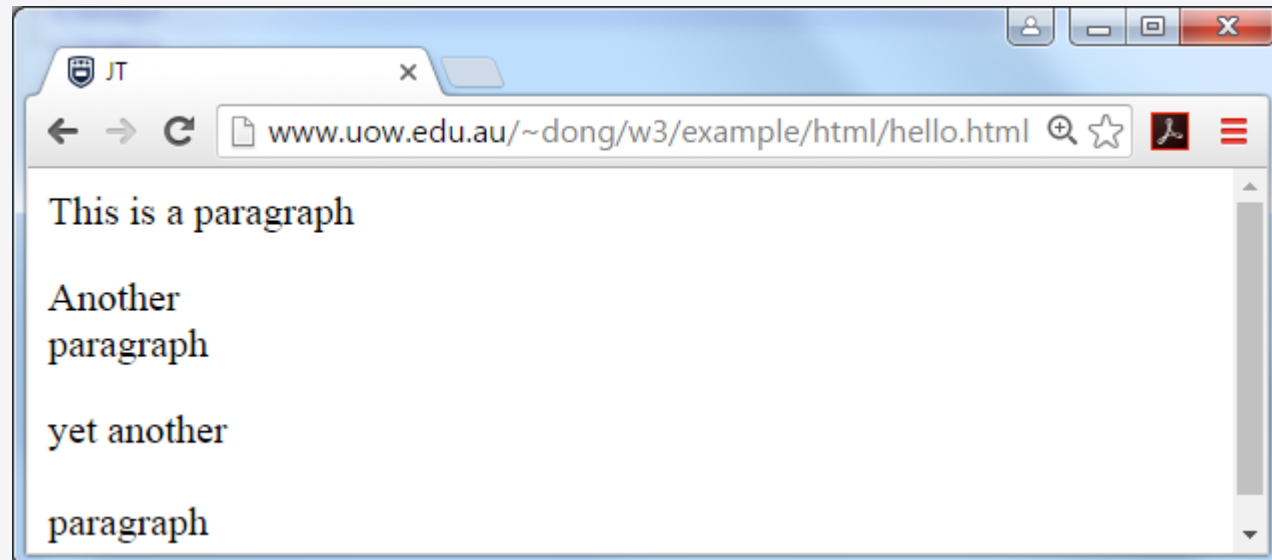
**
** tag defines a **line break**

**
** is an empty element (i.e. it is a tag with no content), it combines the start and end tags together

Horizontal line <hr />

```
<p>This  is a paragraph</p>

<p>Another <br />

paragraph</p>

<hr />

<p>yet    another <br />

<br />

paragraph</p>
```
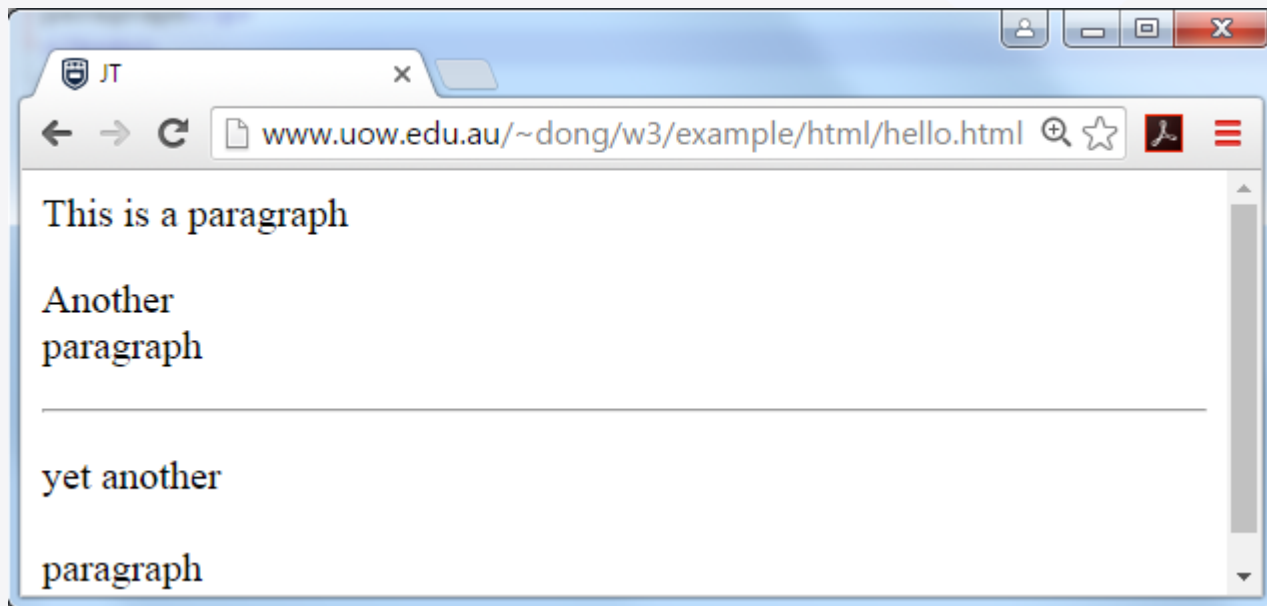
similarly, we have the
horizontal line tag <hr />
with no content

Non-breaking space

```
<p>This    is a
paragraph</p>

<p>Another <br />

paragraph</p>

<hr />

<p>yet      another <br />

<br />

paragraph</p>
```

use ** ** for non-breaking space

this is an example of character entities

What is the output of this code?

Character entity

- Some characters are reserved in HTML.

- Reserved characters in HTML must be replaced with character entities.

Character	Entity	Meaning
(non-breaking space)	` `	Non-breaking space
<	`<`	Is less than
>	`>`	Is greater than
&	`&`	Ampersand
"	`"`	Double quote
'	`'`	Single quote (apostrophe)
o	`°`	Degree
©	`©`	Copyright

Character entity

```
<body>

A HTML document starts with
&lt;html&gt; and ends with
&lt;/html&gt;

</body>
```

A HTML document starts with \<html\> and ends with \<html\>

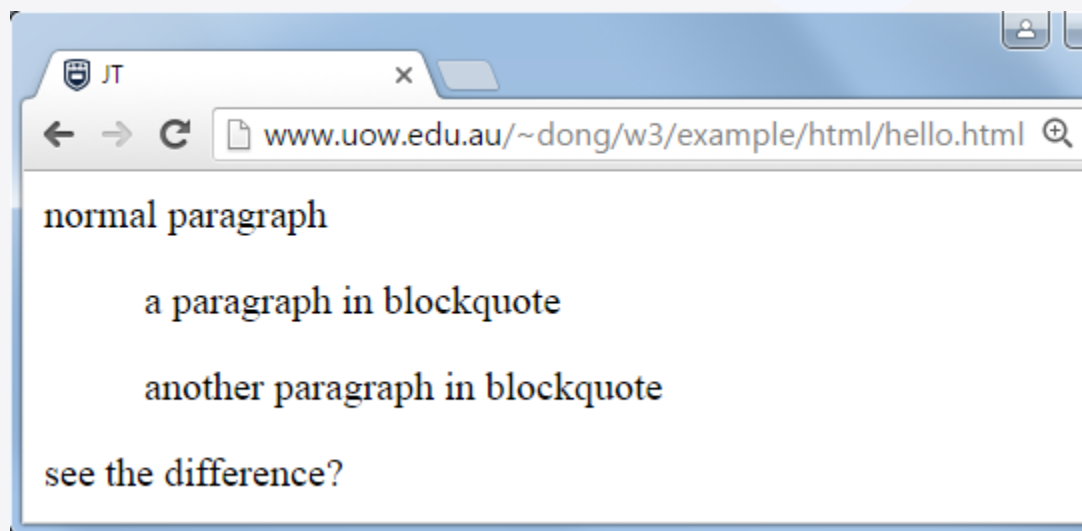# Block quotations <blockquote>

```
<p>normal paragraph</p>

<blockquote>

<p>a paragraph in blockquote</p>

<p>another paragraph in blockquote</p>

</blockquote>

see the difference?
```

Preformatted text <pre>

```
<pre>

Mary

     had   a

          little

               lamb

</pre>
```
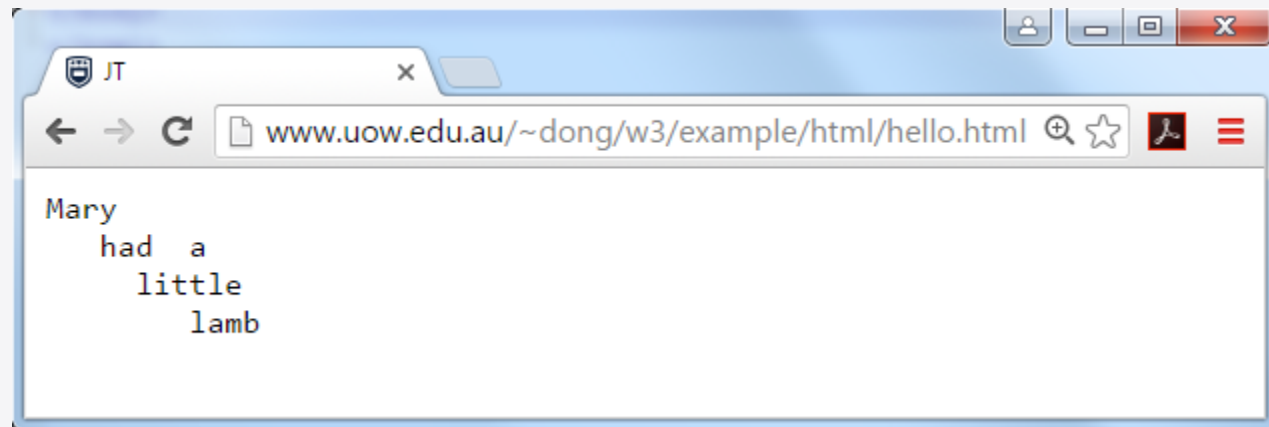
pre **element is shown in monospace**

it preserves the character and line spacing

Computer code

```
<pre>

<code>

a = 0;

b = 3;

c = 2;

sum = a + b + c;

</code>

</pre>
```
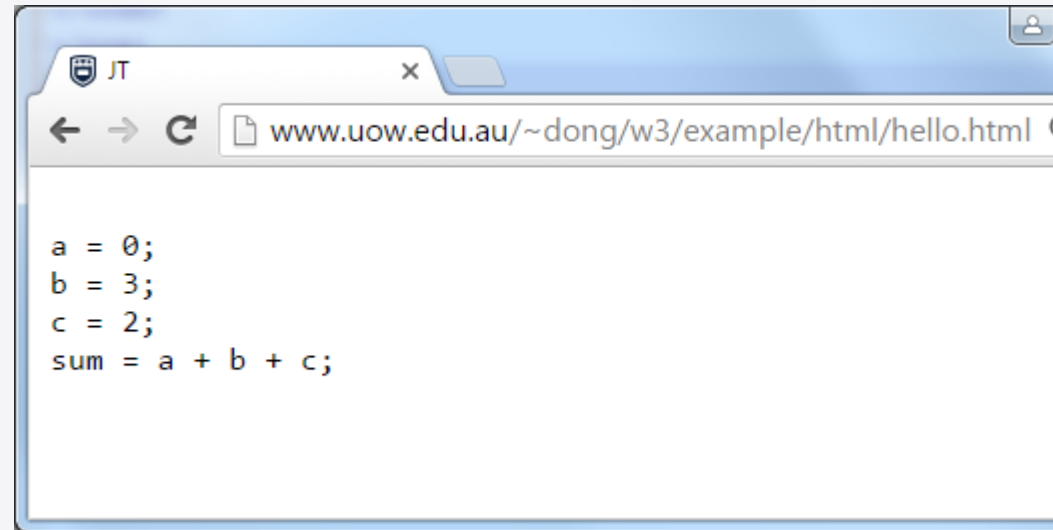

what would happen if we use <code> ... </code> without <pre> ?

Computer code

If you want to include special characters such as

<   >   &   "   '

within **pre** *tags, they should be substituted by character entities so that they are not subject to special interpretation by the browser.*

```
<pre>
<code>
#include &lt;iostream&gt;

void main( ) {
    cout &lt;&lt;  &quot;Hello World!&quot;  &lt;&lt; endl;
}
</code>
</pre>
```

```
#include <iostream>

void main( ) {
    cout << "Hello World!" << endl;
}
```

Image

```
<img src="uow-logo.png" height="300" width="200"

alt="logo of UOW" />
```

Attribute	Description

`src`	URL of an image, for example
	`src="uow-logo.png"`
	`src="`**`images/`**`uow-logo.png"`
	`src="`**`http://`**`www.mycom.au/staff.png"`

`alt`	alternate text for an image
`height` `width`	optional. Specifies height, width for image in pixels, or in percentage

Image src

The URL of an image can be
- an **absolute** URL points to another website, or
- a **relative** URL points to an image file within a website

Absolute URL

```
(1) src="http://www.mycom.au/staff.png"
```

Relative URL

```
(2) src="uow-logo.png"
```
     the image file is in the same directory as the current html file

```
(3) src="images/uow-logo.png"
```
     the image file is in the subdirectory called **images** located at the
     same directory as the current html file

```
(4) src="images/logo/uow-logo.png"
```

```
(5) src="/../f1/bird.png"
```
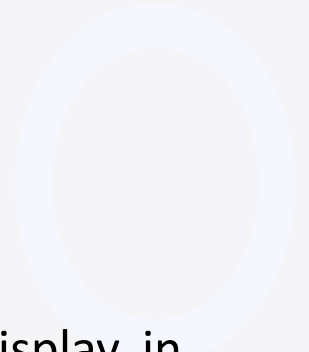
Image alt

```
<img src="uow-logo.png" height="300" width="200"

alt="logo of UOW" />
```

- If a browser cannot find an image, it will display the alt text.

- Sometimes, to save bandwidth, a user can disable the image display, in this case, the alt text will be displayed.

- A screen reader is a software program that can read what is displayed on a screen which is very useful to people who are blind or visually impaired. Screen readers can read the alt text.

Link

```
<a href="http://www.uow.edu.au" target="_blank">Visit UOW</a>


<a href="contact.html">Contact us</a>


<a href="http://www.uow.edu.au" target="_blank">
<img src="uow-logo.png" alt="visit UOW"/>
</a>
```

Link

- The **href** in this example is an **absolute** URL.

```
<a href="http://www.uow.edu.au" target="_blank">Visit UOW</a>
```

- If user clicks on this link, `http://www.uow.edu.au` will be opened in a new tab

target	description
_blank	open the link in a new window or tab
_self	open the link in the same frame (this is default)

Link

- The **href** in this example is a **relative** URL.

  ```
  <a href="contact.html">Contact us</a>
  ```

- It is similar to the `src` attribute of the `img` tag:

  ```
  href="contact.html"

  href="assignment/a1.html"

  href="../handout/note5.html"
  ```

Link

- Within the link tag **`<a href...> </a>`**, we can put any text or image.

- In the example, it displays an image as a link to the address `http://www.uow.edu.au`

```
<a href="http://www.uow.edu.au" target="_blank">

<img src="uow-logo.png" alt="visit UOW"/>

</a>
```

Link - target within document

- Within the html document we can use the **id** attribute to mark a specific location

```
<a href="#Proofs">1 Proofs</a>
<a href="#See_also">2 See also</a>
<a href="#Notes">3 Notes</a>
<a href="#References">4 References</a>
<a href="#External_links">5 External links</a>

<h3 id="Proofs">Proofs</h3>
…
```

The id value must be unique and must contain at least one character.
The id value must not contain any space characters.

Link - target within document

- For example:

```
<a href="#Proofs">1 Proofs</a>
<a href="#See_also">2 See also</a>
<a href="#Notes">3 Notes</a>
<a href="#References">4 References</a>
<a href="#External_links">5 External links</a>

<h3 id="Proofs">Proofs</h3>
…

<h3 id="See_also">See also</h3>
…

<h3 id="Notes">Notes</h3>
…

<h3 id="References">References</h3>
…

<h3 id="External_links">External links</h3>
…
```


Euler's theorem

Contents
1 Proofs
2 See also
3 Notes
4 References
5 External links

Proofs

• • • •

See also

• • • •

Notes

• • • •

References

• • • •

External links

• • • •

Link - target within document

- We can create a link to a specific location within a html page

- For example:

```
<a href="https://en.wikipedia.org/wiki/Euler%27s_theorem#Proofs">
Proof of the Euler theorem</a>
```

Comments

```
<body>

<!-- this is

a long comment

it will not be displayed on the web page

-->


</body>
```

index.html

- index.html is a default page for a directory

- For security reason, it is better to have index.html for every directory

- It stops people from knowing the content and structure of your website

Example: If the directory abc has an index.html then when we go to http://the-web-address/abc

it automatically displays the page http://the-web-address/abc/**index.html**

XHTML

- XHTML stands for E**X**tensible **H**yper**T**ext **M**arkup **L**anguage

- XHTML is stricter than HTML

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

<html xmlns="http://www.w3.org/1999/xhtml">
<head>
  <title></title>
</head>
<body>

</body>
</html>
```

DOCTYPE and **xmlns** are mandatory

XHTML

- XHTML is stricter than HTML

  elements must be properly nested:

  ```
  <b><i>bold and italic - not nested correctly</b></i>
  ```

  It should be like this:
  ```
  <b><i>bold and italic - not nested correctly</i></b>
  ```

XHTML

- XHTML is stricter than HTML

  elements must always be closed:

  ```
  <p>paragraph not closed
  break not closed <br>
  horizontal line not closed <hr>
  image not closed <img src="logo.png" alt="UOW logo">
  ```

  It should be like this:
  ```
  <p>paragraph not closed</p>
  break not closed <br />
  horizontal line not closed <hr />
  image not closed <img src="logo.png" alt="UOW logo" />
  ```

XHTML

- XHTML is stricter than HTML

  elements must be in lower case:

  ```
  <HEAD>
  <TITLE>Web Technologies</TITLE>
  <HEAD>
  ```

  It should be like this:
  ```
  <head>
  <title>Web Technologies</title>
  <head>
  ```

XHTML

- XHTML is stricter than HTML

  attribute names must be in lower case:

  ```
  <img SRC="logo.png" ALT="UOW logo" />
  ```

  It should be like this:
  ```
  <img src="logo.png" alt="UOW logo" />
  ```

XHTML

- XHTML is stricter than HTML

  attribute values must be quoted:

  ```
  <img src=logo.png alt=UOW logo />
  ```

  It should be like this:
  ```
  <img src="logo.png" alt="UOW logo" />
  ```

XHTML

- XHTML is stricter than HTML

  attribute minimization is not allowed:

  ```
  <input type="checkbox" name="subscribe" value="eletter"
  checked />
  ```

  It should be like this:
  ```
  <input type="checkbox" name="subscribe" value="eletter"
  checked="checked" />
  ```

Can you make a list of the minimized attributes used in HTML?

HTML5

- version 5 of the HTML standard

- introduces new tags

  ```
  <header> <footer> <article> <section>
  <svg> <canvas> <audio> <video> …
  ```

- introduces new APIs
  - Drag and Drop
  - Local Storage
  - Geolocation
  - ….