# **Web Application Development**



#### HTML

#### HTML

- Stands for hyper text markup language
- Hyper Text
  - The text that has reference/link to another text document
- Markup language
  - Language that is both machine and human readable, It is text-encoding system consisting of a set of symbols inserted in a text document to control its structure, formatting and contents
- HTML Page
  - HTML pages are text documents containing HTML structure

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## What is HTML?

- HTML is markup language
- HTML is an **interpreted** language
- HTML describes the structure of a page
- HTML files are text files with extension "htm" or "html" (we will always use
   ".html" extension in this class)

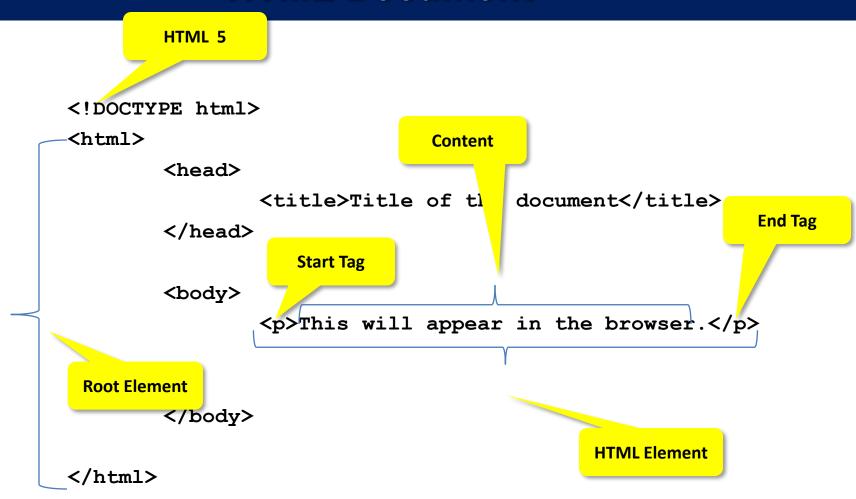
## HTML Tags

- HTML markup tags are usually called HTML tags
  - HTML tags are keywords surrounded by angle brackets like <html>
  - HTML tags normally come in pairs like and
    - The first tag in a pair is the start tag, the second tag is the end tag
    - Start and end tags are also called opening tags and closing tags

#### **HTML Elements**

- An HTML element is defined by a start tag, some content, and an end tag.
- Example
  - <body>...</body>
  - -<h1>...</h1>
  - -...

## **HTML Document**



Don't worry about contents

</html>

```
This is the Main Heading
<html>
  <body>
    <h1>This is '
                   This text might be an introduction to the rest of the page. And if the page is
    This text a long one it might be split up into several sub-headings.
       the page.
       be split This is a Sub-Heading
    <h2>This is
    Many long articles have sub-headings so to help you follow the structure of
                   what is being written. There may even be sub-sub-headings (or lower-level
       you follo
                   headings).
        There may
        headings)
                   Another Sub-Heading
    <h2>Another
    Here you can see another sub-heading.
  </body>
```

```
<br/>body)
  <h1>This is the Main Heading</h1>
  This text might be an introduction to the rest of
          The opening <html> tag indicates that
            anything between it and a closing
                </html> tag is HTML code.
      here
    headi
             Sub-Head Ind // IIZ
 Here you can see another sub-heading.
</body
```

```
<html>
 <br/>body>
   <h1>This is the Main Heading</h1>
   This text might be an introduction to the rest of
                The <body> tag indicates that
             anything between it and the closing
   Ma
            </body> tag should be shown inside
      There
                 the main browser window.
      headi
               Sub-Head Ind// UC/
   Here you can see another sub-heading.
```



# This is the Main Heading

This text might be an introduction to the rest of the page. And if the page is a long one it might be split up into several sub-headings.

# Word This is a Sub-Heading

Many long articles have sub-headings so to help you follow the structure of what is being written. There may even be sub-sub-headings (or lower-level headings).

```
heading
<a href="heading">heading</a>
Another Sub-Heading
<a href="heading">heading</a>
<a href="heading">heading</a>
Another Sub-Heading
<a href="heading">heading</a>
<a href="heading">
```

```
<html>
 <body>
   <h1>This is the Main Heading</h1>
   This text might be an introduction to the rest of
             And if the page is a long one it might
                            headings.<p
         paragraph of text
    appears between these
                                        to help
                                         written.
       >and  tags.
                                        ower-level
   Here you can see another sub ne
 </body>
</html>
```

#### **Attributes**

- Attributes Tell Us More About Elements
  - Attributes provide additional information about the contents of an element. They appear on the opening tag of the element and are made up of two parts: a name and a value, separated by an equals sign.

```
 <h2 title="inside h2">Web Application Development</h2>
  <h4 title="inside h4 ">Welcome to the course</h4>
  <h4 Style="color:blue">Why it appears blue</h4>
```

## **Exercise**

Write down corresponding HTML code

#### **Web Application Development**

Welcome to the course

Why it appears blue

## Headings

- HTML has six "levels" of headings:
  - <h1> is used for main headings
  - <h2> is used for subheadings
  - If there are further sections
  - under the subheadings then the
  - <h3> element is used, and so on...

## Headings

- HTML has six "levels" of headings:
  - <h1> is used for main headings
  - <h2> is used for subheadings
  - If there are further sections
  - under the subheadings then the
  - <h3> element is used, and so on...

## Heading

## Example code

```
<ht.ml>
 <head>
  <title>This is the Title of the Page</title>
</head>
                                                                                                                                                                                                      This is the Title of the Page
<body>
                                                                                                                                                                                                                                             www.CUSTSemester6.com/example3.html
  <h1>This is a Main Heading<
  <a href="https://www.enants.com/heading-to-this-is-a-level-2-Heading-to-this-is-a-Level-2-Heading-to-this-is-a-Main Heading-to-this-is-a-Level-2-Heading-to-this-is-a-Main Heading-to-this-is-a-Level-2-Heading-to-this-is-a-Main Heading-to-this-is-a-Level-2-Heading-to-this-is-a-Level-2-Heading-to-this-is-a-Level-2-Heading-to-this-is-a-Level-2-Heading-to-this-is-a-Level-2-Heading-to-this-is-a-Level-2-Heading-to-this-is-a-Level-2-Heading-to-this-is-a-Level-2-Heading-to-this-is-a-Level-2-Heading-to-this-is-a-Level-2-Heading-to-this-is-a-Level-2-Heading-to-this-is-a-Level-2-Heading-to-this-is-a-Level-2-Heading-to-this-is-a-Level-2-Heading-to-this-is-a-Level-2-Heading-to-this-is-a-Level-2-Heading-to-this-is-a-Level-2-Heading-to-this-is-a-Level-2-Heading-to-this-is-a-Level-2-Heading-to-this-is-a-Level-2-Heading-to-this-is-a-Level-2-Heading-to-this-is-a-Level-2-Heading-to-this-is-a-Level-2-Heading-to-this-is-a-Level-2-Heading-to-this-is-a-Level-2-Heading-to-this-a-Level-2-Heading-to-this-is-a-Level-2-Heading-to-this-a-Level-2-Heading-to-this-a-Level-2-Heading-to-this-a-Level-2-Heading-to-this-a-Level-2-Heading-to-this-a-Level-2-Heading-to-this-a-Level-2-Heading-to-this-a-Level-2-Heading-to-this-a-Level-2-Heading-to-this-a-Level-2-Heading-to-this-a-Level-2-Heading-to-this-a-Level-2-Heading-to-this-a-Level-2-Heading-to-this-a-Level-2-Heading-to-this-a-Level-2-Heading-to-this-a-Level-2-Heading-to-this-a-Level-2-Heading-to-this-a-Level-2-Heading-to-this-a-Level-2-Heading-to-this-a-Level-2-Heading-to-this-a-Level-2-Heading-to-this-a-Level-2-Heading-to-this-a-Level-2-Heading-to-this-a-Level-2-Heading-to-this-a-Level-2-Heading-to-this-a-Level-2-Heading-to-this-a-Level-2-Heading-to-this-a-Level-2-Heading-to-this-a-Level-2-Heading-to-this-a-Level-2-Heading-to-this-a-Level-2-Heading-to-this-a-Level-2-Heading-to-this-a-Level-2-Heading-to-this-a-Level-2-Heading-to-this-a-Level-2-Heading-to-this-a-Level-2-Heading-to-this-a-Level-2-Heading-to-this-a-Level-2-Heading-to-this-a-Level-2-Heading-to-this-a-Level-2-Heading-to-this-a-Level-2-
  <h3>This is a Level 3 Head:
 <h4>This is a Level 4 Head: This is a Level 2 Heading
  <h5>This is a Level 5 Head:
  <h6>This is a Level 6 Head: This is a Level 3 Heading
</body>
                                                                                                                                                                                    This is a Level 4 Heading
 </html>
                                                                                                                                                                                    This is a Level 5 Heading
```

## Paragraph

 A paragraph consists of one or more sentences that form a kind of dialogue.

#### **Bold and Italic**

#### Bold

By enclosing words in the tags <b> and </b> we can make characters appear bold.

#### Italic

By enclosing words in the tags <i> and </i> we can make characters appear italic.

## Example

```
<html>
<body>
<b>This text is bold</b>
<i>>This text is bold
<i>This text is italic</i>
This is<sub> subscript</sub> and <sup>superscript</sup>
This text is italic
This text is italic
This text is italic
This is subscript and superscript
```

## **Line Breaks & Horizontal Rules**

## Example

```
<html>
<head>
<title>This is the Title of the Page</title>
</head>
<body>
The Earth<br />gets one hundred tons heavier
every day<br />due to falling space dust.
                        This is the Title of the Page
                                                 This is the Title of the Page
Venus is the o
clockwise.
                         → C • www.CUSTSemester6.com/horizentalRule.html
<hr />
Jupiter is big The Earth
                     gets one hundred tons heavier every day
combined.
                     due to falling space dust.
</body>
</html>
                     Venus is the only planet that rotates clockwise.
```

Jupiter is bigger than all the other planets combined.

#### **Abbreviation or Accronium**

- Abbreviation or an acronym
  - Use an abbreviation or an acronym, when you like to add shortened versions of something else

```
<!DOCTYPE html>
<html>
<body>
<h1>The abbr element</h1>
The <abbr title="World Health Organization">WHO</abbr> was founded in 1948.
</body>
</body>
</html>
```

The WHO was founded in 1948.

#### **HTML Quotations**

```
<!DOCTYPE html>
<html>
<html>
<body>
The HTML address.
<address>
Written by John Doe.<br>
Visit us at:<br>
Example.com<br>
Box 564, Disneyland<br>
USA
</address>
</body>
</html>
```

The HTML address.

Written by John Doe. Visit us at: Example.com Box 564, Disneyland USA

## **HTML Comments**

 Just like other languages, HTML also provides tags to add comments

```
<!-- Write your comments here -->
```

## **HTML Images**

- The HTML <img>
  - tag is used to embed an image in a web page.

```
<html>
<body>
<html>
<h2>HTML Image</h2>
<img src="img.jpg" alt="Flowers" width="460" height="345">
</body>
</html>
```



#### **Absolute Paths**

 An absolute URL contains everything you need to uniquely identify a particular file on the Internet.

http://www.cust.edu.pk/Faculties/tabid/56/Default.aspx

C://courses/web/page.html

#### **Relative Paths**

- A relative URL indicates where the resource is in relation to the current page.
  - Same Directory contact.html
  - Subdirectory
    - arts/index.html
    - entertainment/arts/index.html
  - Parent Directory
    - ../index.html
    - ../../index.html
  - From the Root / contact.html

#### Lists

HTML provides us with three different types:

#### Ordered lists

are lists where each item in the list is numbered.

#### Unordered lists

• are lists that begin with a bullet point (rather than characters that indicate order).

#### Definition lists

 are made up of a set of terms along with the definitions for each of those terms.

### List

#### Ordered List

- **-<0|>** 
  - The ordered list is created with the <oI> element.
- - The unordered list is created with element.
- - Each item in the list is placed between an opening <Ii> tag
  - and a closing 
     tag. (The Ii stands for list item.)
- Browsers indent lists by default.

### List

## Example

```
<!DOCTYPE html>
<html>
<body>
<h2>An Unordered HTML List</h2>
<l
 Coffee
 Tea
 Milk
<h2>An Ordered HTML List</h2>
Coffee
 Tea
 Milk
</body>
</html>
```

#### An Unordered HTML List

- Coffee
- Tea
- Milk

#### An Ordered HTML List

- 1. Coffee
- 2. Tea
- 3. Milk

#### List

#### Definition List

 The definition list is created with the <dl> element and usually consists of a series of terms and their definitions.

## **Example HTML document**

</html>

# Scrambled Eggs

Eggs are one of my favourite foods. Here is a recipe for deliciously rich scrambled eggs.

#### Ingredients

- 2 eggs
- 1tbs butter
- 2tbs cream

#### Method

- Melt butter in a frying pan over a medium heat
- 2. Gently mix the eggs and cream in a bowl
- Once butter has melted add cream and eggs
- Using a spatula fold the eggs from the edge of the pan to the center every 20 seconds (as if you are making an omelette)
- When the eggs are still moist remove from the heat (it will continue to cook on the plate until served)

```
<html>
 <head>
   <title>Lists</title>
 </head>
 <body>
   <h1>Scrambled Eggs</h1>
   Eggs are one of my favourite foods. Here is a
      recipe for deliciously rich scrambled eggs. 
   <h2>Ingredients</h2>
   <u1>
     <1i>2 eggs</1i>
     ltbs butter
     \li>2tbs cream
   <h2>Method</h2>
   (01)
     Melt butter in a frying pan over a medium
         heat
     Gently mix the eggs and cream in a bowl
     Once butter has melted add cream and eggs
     Using a spatula fold the eggs from the edge of
         the pan to the center every 20 seconds (as if
         you are making an omelette)
     When the eggs are still moist remove from the
         heat (it will continue to cook on the plate
         until served)
   </r>
 </body>
```

#### Link

## Hyperlink

- A hyperlink is a word, phrase, or image that you can click on to jump to a new document or a new section within the current document.
- Example
  - <a href="url">link text</a>

## Example

- Home
- About
- Movies
- Contact

- Opening link in new window
  - Open link in new page by using target="\_blank"

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Linking to a Specific Part of the Same Page

```
<!DOCTYPE html>
<html>
                                   <body>
                                                                   <h1 id="top">Film-Making Terms</h1>
                                                                   <a href="#bottom">bottom</a><br />
                                                                   <br /><br /><br /><br /><br /><br />
                                                                   <br /><br /><
                                                                  <br /><br /><
                                                                   <br /><br /><
                                                                   <br /><br /><
                                                                   <br /><br /><br/><br /><br /><
                                                                   <br /><br /><br/><br /><br /><
                                                                  <h2 id="bottom">Bottom of the page</h2>
                                                                   A speech, preface, introduction, or brief scene
                                                                  preceding the the main action or plot of a film;
                                                                  contrast to epilogue
                                                                   <a href="#top">Top</a>
                                   </body>
 </html>
```

Linking to a Specific Part of the another Page

 If you want to link to a specific part of a different page (whether on your own site or a different website) you can use a similar technique.

## **Images**

 There are three rules to remember when you are creating images.

- Save images in the right format
- Save images at the right size
- Use the correct resolution

# Figure & Figure Caption

- <figure> element to contain images
- The <img> element is used to add images to a web page
- <figcaption> allow web page authors to add a caption to an image.

```
<figure>
<img src="images/otters.jpg" alt="Photograph of
two sea otters floating in water">
<br />
<figcaption>Sea otters hold hands when they
sleep so they don't drift away from each
other.</figcaption>
</figure>
```



Sea otters hold hands when they sleep so they don't drift away from each other.

## **Images**

```
<html>
 <head>
   <t1tle>Images</t1tle>
 </head>
 <body>
   <h1>
     <1mg src="1mages/logo.g1f"</pre>
         alt="From A to Zucchini" />
   </h1>
   <f1gure>
     </
          alt="Chocolate Islands"
         title="Chocolate Islands Individual Cakes" />
     <f1gcapt1on>
         This recipe for individual chocolate
         cakes is so simple and so delectable!
       </figcaption>
     </flgure>
   <h4>More Rec1pes:</h4>
   </
          alt="Lemon Posset"
         t1t1e="Lemon Posset Dessert" />
     </mg src="1mages/roasted-brussel-sprouts.jpg"</pre>
          alt="Roasted Brussel Sprouts"
         title="Roasted Brussel Sprouts Side Dish" />
     <1mg src="1mages/zucch1n1-cake.jpg"</pre>
         alt="Zucchini Cake"
         title="Zucchini Cake No Frosting" />
   </body>
</html>
```

# From A to Zucchini



This recipe for individual chocolate cakes is so simple and so delectable!

#### More Recipes:







A table represents information in a grid format.

#### Table

— The element is used to create a table. The contents of the table are written out row by row.

#### Row

- start of each row using the opening tag and closing tag

#### Cell

– Each cell of a table is represented using a element with

15 15 30

45 60 45

60 90 90

```
(tr)
 15
 15
 30
(tr>
 45
 60
 45
(/tr>
(tr>
 60
 90
 90
```

```
(tr>
 Saturday
 Sunday
(tr>
 Tickets sold:
 120
 135
(tr)
 Total sales:
 $600
 $675
```

#### Saturday Sunday

Tickets sold: 120 135 Total sales: \$600 \$675

```
(tr>
 9am
 10am
 >11am
 12am
(tr>
 Monday
 Geography
 Math
 Art
(tr>
 Tuesday
 Gym
 Home Ec
```

	9am	10am	11am	12am
Monday	Geography		Math	Art
Tuesday	Gym			Home Ec

```
<html>
 <head>
  <title>Tables</title>
 </head>
 (body)
  <thead>
    (tr)
      Home starter hosting
     Premium business hosting
      (/tr>
   </thead>
   (tr)
     Disk space
      250mb
     1gb
    (tr)
     Bandwidth
     5gb per month
     50gb per month
    (/tr)
    <!-- more rows like the two above here -->
   <tfoot>
    (tr)
      Sign up now and save 10%!
    (/tr>
   </tfoot>
  </body>
</html>
```

#### Home starter hosting Premium business hosting

Disk space 250mb 1gb

Bandwidth 5gb per month 50gb per month

Sign up now and save 10%!

## **HTML Forms**

- Whenever you want to collect information from visitors you will need a form, which lives inside a <form> element.
- Information from a form is sent in name/value pairs.
- Each form control is given a name, and the text the user types in or the values of the options they select are sent to the server.

#### **HTML Form Structure**

#### • <form>

 This element should always carry the action attribute and will usually have a method and id attribute too.

#### Action

 Every <form> element requires an action attribute. Its value is the URL for the page on the server that will receive the information.

#### Method

Forms can be sent using one of two methods: get or post.

#### HTML FORMS

Username:	lvy	
Password:		

#### HTML FORMS

```
<form action="http://www.example.com/comments.php">
  What did you think of this gig?
  <textarea name="comments" cols="20" rows="4">Enter
    your comments...</textarea>
  </form>
```

```
What did you think of this gig?

Enter your comments...
```

Please select your favorite genre:

○ Rock ○ Pop ● Jazz

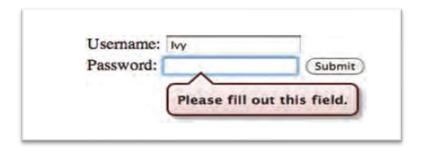
What happens if you repeat same name in radio control???

#### **HMTL FORMS**

```
Please select your favorite music service(s):

☑ iTunes □ Last.fm □ Spotify
```

```
<form action="http://www.example.com/login/"
    method="post">
    <label for="username">Username:</label>
    <input type="text" name="username"
        required="required" /> </title><br />
        <label for="password">Password:</label>
        <input type="password" name="password"
        required="required" />
        <input type="submit" value="Submit" />
        </form>
```



## **Grouping Form Elements**

You can group related form controls together inside the <fieldset> element.

The <legend> element can come directly after the opening <fieldset> tag and contains a caption which helps identify the purpose of that group of form controls.



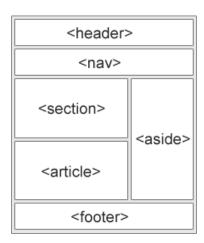
## **HTML Form Example**

```
<html>
  <head>
                                                                                        Would you visit again?
   <t1tle>Forms</t1tle>
                                                                                        <br />
  </head>
                                                                                        <1abe1>
  <body>
                                                                                           <input type="radio" name="rating" value="yes" />
   <form action="http://www.example.com/review.php" method="get">
      <f1e1dset>
                                                                                           Yes
       <1egend>
                                                  - Your Details:
         Your Details:
                                                  Name:
       </1egend>
                                                  Email:
       <1abe1>
         Name:
         <1nput type="text" name="name" s1ze="3</pre>
                                                Your Review:
       </1abe1>
       <br />
                                                  How did you hear about us? Advert ×
       <1abe1>
                                                  Would you visit again?
         Ema11:
         <1nput type="email" name="email" size=</pre>
                                                   O Yes O No O Maybe
       </1abe1>
       <br />
                                                  Comments:
      </fleat/
      <br />
      <f1e1dset>
       <1egend>
         Your Rev1ew:
       >
                                                   Sign me up for email updates
         <label for="hear-about">
           How d1d you hear about us?
                                                    Submit review
                                                                                                                                                     !d" />
         </1abe1>
          <select name="referrer" 1d="hear-about->
                                                                                      </1abe1>
           <option value="google">Google</option>
                                                                                      <br />
            <option value="friend">Friend</option>
                                                                                      <input type="submit" value="Submit review" />
           <option value="advert">Advert</option>
                                                                                    </fle1dset>
            <option value="other">Other</option>
                                                                                  </form>
         </select>
                                                                               </body>
       >
                                                                              </html>
```

# HTML5 SEMANTIC ELEMENTS

#### **New Semantic Elements**

- Many web sites contain HTML code like: <div id="nav"> <div class="header"> <div id="footer"> to indicate navigation, header, and footer.
- HTML5 offers new semantic elements to define different parts of a web page, for example:
  - <header>
  - <footer>
  - <nav>
  - <section>
  - <article>
  - <aside>



• Internet Explorer 8 and earlier, does not support new semantic elements

# HTML5 MULTIMEDIA ELEMENTS

#### HTML5 Video

- Before HTML5, there was no standard for showing videos on a web page.
- Before HTML5, videos could only be played with a plug-in (like flash).
- The HTML5 < video > element specifies a standard way to embed a video in a web page.

## **HTML5 Video**

HTML5 <video> element supports 3 video formats: MP4, WebM, and Ogg:

Browser	MP4	WebM	Ogg
Internet Explorer	YES	NO	NO
Chrome	YES	YES	YES
Firefox	YES	YES	YES
Safari	YES	NO	NO
Opera	YES (from Opera 25)	YES	YES

### HTML5 Video

- The controls attribute adds video controls, like play, pause, and volume.
- Text between the <video> and </video> tags will only display in browsers that do not support the <video> element. To start a video automatically use the autoplay attribute
- Multiple <source> elements can link to different video files. The browser will use the first recognized format.

See Example: HTML5 Native Video

#### HTML5 Audio

- Before HTML5, there was no standard for playing audio files on a web page.
- Before HTML5, audio files could only be played with a plug-in (like flash).
- The HTML5 <audio> element specifies a standard way to embed audio in a web page.

## HTML5 Audio

• HTML5 <audio> element supports 3 audio formats: MP3, Wav, and Ogg:

Browser	МР3	Wav	Ogg
Internet Explorer	YES	NO	NO
Chrome	YES	YES	YES
Firefox	YES	YES	YES
Safari	YES	YES	NO
Opera	YES	YES	YES

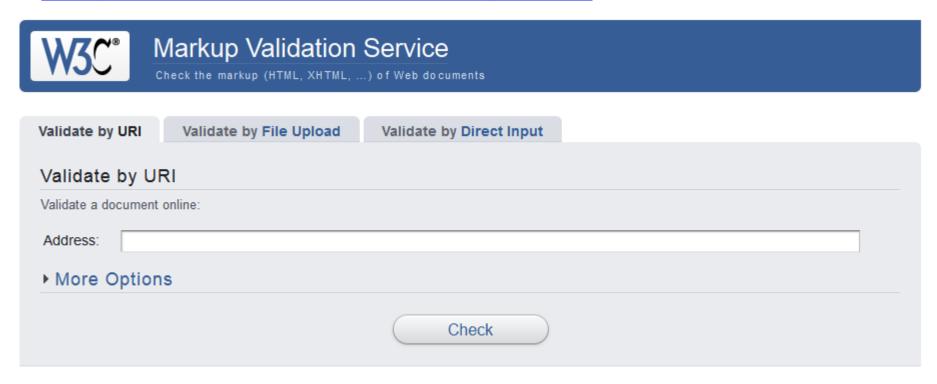
## HTML5 Audio

- The controls attribute adds audio controls, like play, pause, and volume.
- Text between the <audio> and </audio> tags will display in browsers that do not support the <audio> element. To start a audio automatically use the autoplay attribute
- Multiple <source> elements can link to different audio files. The browser will use the first recognized format.

See Example: HTML5 Native Audio

## Markup Validation Service

- http://validator.w3.org/
- https://validator.w3.org/nu/



This validator checks the markup validity of Web documents in HTML

## **HTML Entities**

Result	Description	Entity Name	Entity Number
	non-breaking space		<b> </b> ;
<	less than	<	<b>&amp;</b> #60;
>	greater than	>	<b>&amp;</b> #62;
&	ampersand	&	<b>&amp;</b> #38;
¢	cent	¢	¢
£	pound	£	<b>&amp;</b> #163;
¥	yen	¥	<b>&amp;</b> #165;
€	euro	€	€
©	copyright	&сору;	<b>&amp;</b> #169;
®	registered trademark	®	®

More: http://www.w3schools.com/html/html\_entities.asp

## **HTML Page**

- HTML page can be created on multiple text editor including:
  - Notepad/Notepad ++
  - Sublime Text
  - Visual Studio Code (VS Code)
  - Visual Studio
  - Adobe Dreamweaver
  - Much more...

## HTML Self Study – Tags & Attributes

- HTML Tag Reference
  - https://www.w3schools.com/tags/
- HTML Global Attributes
  - https://www.w3schools.com/tags/ref\_standardattrib utes.asp