

# Web Applications

**HTML5**  
**advanced features**

# HTML5 versus XHTML

## XHTML

lower case  
element names

lower case  
attribute names

attribute values  
have to be in quotes

each non-empty element  
needs closing tag

each empty element  
needs to be self-closed

## HTML5

lower case or upper case  
element names

lower case or upper case  
attribute names

attribute values  
can be in quotes

some non-empty elements  
don't need closing tags

empty elements don't need  
to be self-closed

# HTML5 versus XHTML

XHTML only accepts

`<table>`

`<div class="blah">`

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

`<p> some text </p>`

`<p> some more text </p>`

``

HTML5 also accepts

`<TABLE>` or

`<Table>`

`<div CLASS="blah">` or

`<div Class="blah">`

`<meta charset=UTF-8 />`

`<p> some text`

`<p> some more text`

``

# HTML5 advanced features

- “semantic elements” for parts of a page
- form validation and new form input types
- video / audio
- MathML for displaying mathematical formulas
- JavaScript APIs: web storage, geolocation, drag and drop, graphics with “canvas”, ...
- ...

# Semantic elements

## `<header>`

Banner / header at beginning of page or beginning of a section of page

## `<footer>`

Wraps a footer, i.e. content at end of page, such as contact details or copyright notices

## `<nav>`

A section that contains navigational material - menu

# Semantic elements

## `<section>`

A logically related part of a web page (e.g. “news”, “contact details”, “introduction” or a chapter of a document)

## `<article>`

A relatively independent piece of content, such as blog entry (article), or a particular news article

## `<aside>`

Content separate from main content, - as found in a side bar (separate to right or left) e.g. adverts, notes on topics that the user might also be interested in.

# Semantic elements

**<time>** To specify a date as *YYYY-MM-DD*  
or date + time *YYYY-MM-DDThh:mm±hh:mm*

Where *±hh:mm* is time zone

Many variations, e.g.

```
<time datetime="2012-12-26">
```

```
26th December 2012 </time>
```

```
<time datetime="2012-12-26T10.30+00:00"> | 26th
```

```
December 2012 at 10.30 GMT</time>
```

```
<time datetime="2012-12-26T10.30Z">
```

```
26th December 2012 at 10.30 GMT </time>
```

# Video / audio

`<video>`

`<audio>`

Replace need for third part plug-in  
(e.g. Adobe Flash, Apple QuickTime), which  
required `<object>` and `<embed>` elements

```
<video src="CuteCat.webm"  
      controls type="video/webm">  
</video>
```



# <source>

Not all browsers recognise all formats, so need to provide the video in multiple formats, using the source element

```
<video controls>
  <source src="CuteCat.mp4"
    type="video/mp4" />
  <source src="CuteCat.webm"
    type="video/webm" />
  <source src="CuteCat.ogv"
    type="video/ogg" />
</video>
```

# Containers and codecs

- Video file formats such as  
MPEG4 (.mp4), WebM (.webm), OGG (.ogg),  
Flash (.flv) and AVI (.avi)

are containers for

- video track (or stream)
- audio track (or stream)
- metadata about the tracks (e.g. titles of the tracks, aspects ratios of videos)

*Video players decode tracks in the container and output synchronized video and audio signals*

# CODECS

- Many ways to encode and decode video and audio (between analog and digital and *vice versa*)
  - Data compression methods: lossy vs lossless

A codec is an algorithm for coding and decoding e.g.

**Video:** H.264, Theora, VP8

**Audio:** MP3, Vorbis, AAC

# Some Video codecs for HTML5

**H.264** = MPEG-4 part 10 (MPEG-4 AVC)

Multiples *profiles* for vary levels of quality (e.g. baseline, main, high). (Blue ray uses high)

-Patented

**Theora** – developed by Xiph.org Foundation  
evolved from VP3. No Patents

**VP8** – from On2 – now Google  
similar quality to H.264, but not patented

# Some Audio codecs for HTML5

**MP3** = MPEG 1 – Audio Layer 3 : Patented

1 or 2 channels,

various bit rates – can adapt to content

**AAC** (Advanced Audio Coding) : Patented

Up to 48 channels. Multiple profiles

(better quality than MP3)

**Vorbis** (or Ogg Vorbis) : Not Patented

fixed / variable bit rate. Up to 255 channels

Similar quality to AAC

# Some containers supported on Web

MPEG-4 (.mp4)

H.264 + AAC

(Chrome, Firefox, IE, Opera, Safari)

OGG

Theora + Vorbis

(Chrome, Firefox, Opera)

WebM

VP8 + AAC

(Chrome, Firefox, Opera)

# <video> attributes

```
<video src="CuteCat.webm"  
  type="video/webm"  
  width="500" height="480" controls >  
</video>
```

**width** and **height** – of the video display

**controls** – to provide usual play, pause etc controls

**autoplay** – to download and start playing automatically

**type** – tells browser about the format

# <audio>

Audio similar to video, but no size attributes, e.g.

```
<audio controls>
```

```
<source src="DogBarking.mp3"
```

```
type="audio/mp3" />
```

```
<source src="DogBarking.ogv"
```

```
type="audio/ogg" />
```

```
</audio>
```



# MIME file types

MIME – Multipurpose Internet Mail Extension

= Internet Media Type

Examples : type/subtype

text e.g. **text/html**, **text/plain**,  
**text/javascript**, **text/css**

image e.g. **image/gif**, **image/jpeg**, **image/png**

video e.g. **video/mpeg**, **video/mp4**, **video/ogg**

audio e.g. **audio/mpeg**, **audio/ogg**, **audio/mp4**

# Favicons

- favicon (*favourite icon*)  
small icon that is displayed in the browser tab

```
<link rel="icon" type="image/png"  
      href="HTML5logo.png" />
```

- Warning: older versions of IE expect the favicon to be called `favicon.ico` and located in the root directory. (see the favicon Wikipedia page for details)

# HTTP Redirecting

- Not part of HTML5 but still useful: redirecting

```
<meta http-equiv="refresh"  
      content="5;  
url='http://www.cs.cf.ac.uk' " />
```

- This simulates a HTTP header (http-equiv)
- Technique is officially deprecated (accessibility) but can still be useful when having to redirect users to a new location of a web site.

# Inside the <head>

Elements in the <head> section include

- **<title>**, **<base>**, **<link>**, **<meta>**, **<script>**, **<style>**

Example of <meta>:

```
<meta name="keywords"  
      content="desks, chairs, pens" />
```

Name attribute can have other values such as  
“author”, “description”, date-last-modified...