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INTRODUCTION TO WEB DEVELOPMENT

Code: COMP07009

Week 8

http://www.w3schools.com/html/html5_form_input_types.asp
http://www.w3.org/standards/webdesign/graphics.html

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VALIDATION

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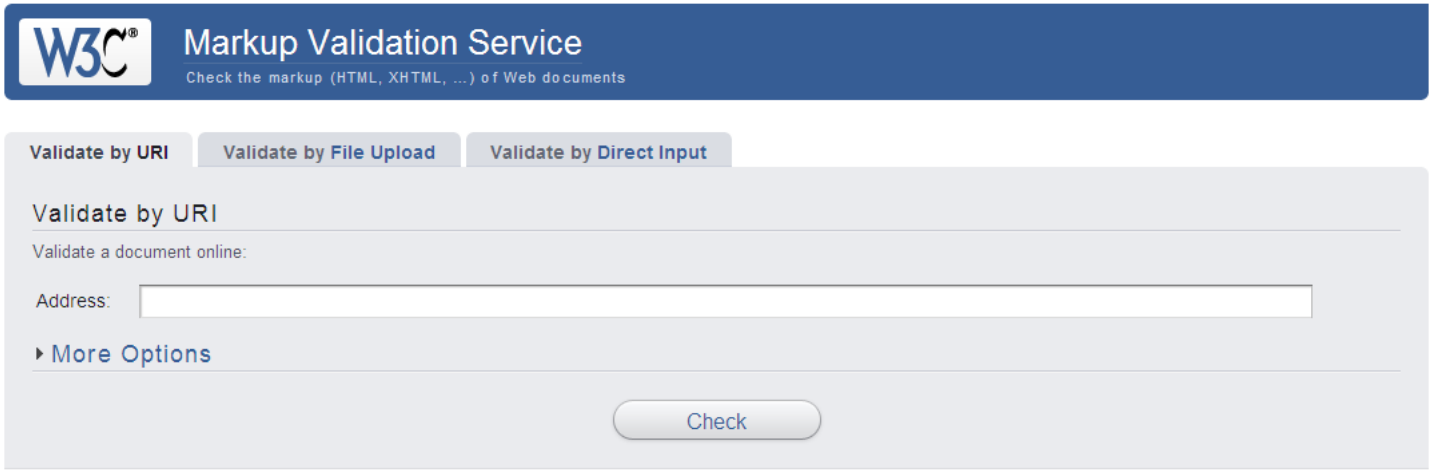
HTML5 Validation

- <!DOCTYPE html> tells validator version of html
- http://validator.w3.org/



- Choose File Upload tab
- Browse to HTML document and select Check button

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Result

- Successful validation

This document was successfully checked as HTML5!	
Result:	Passed, **1 warning(s)**

- The warning is because HTML5 is not a standard as yet

- Unsuccessful validation

Errors found while checking this document as HTML5!	
Result:	2 Errors, 1 warning(s)

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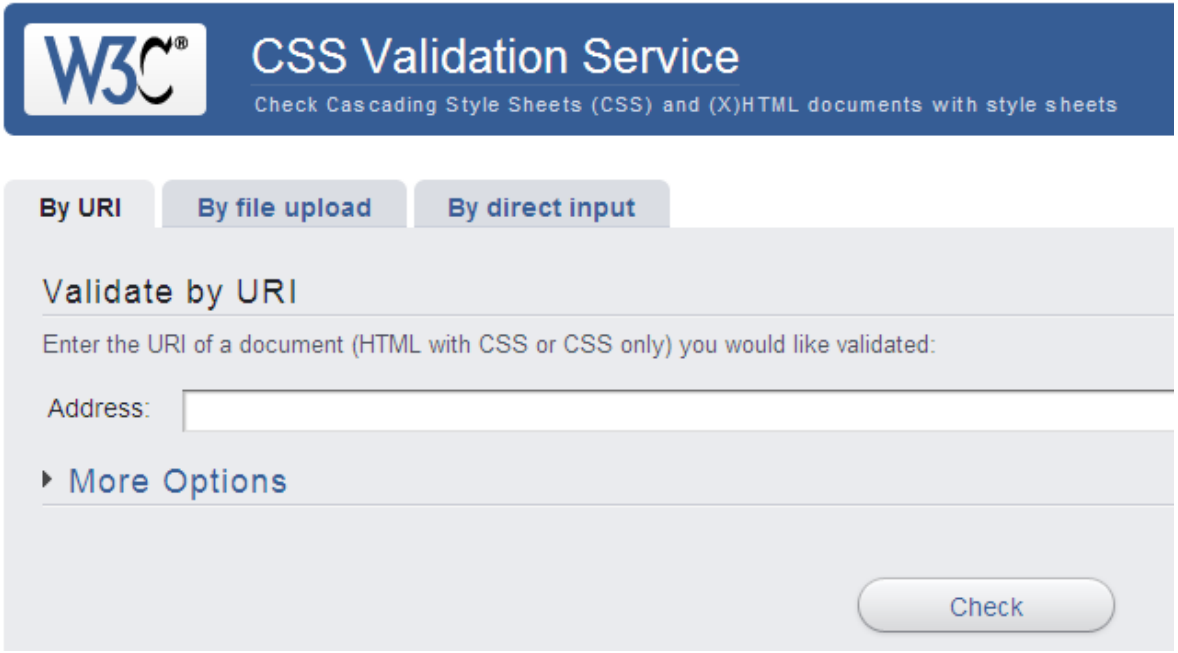
CSS Validation

- http://jigsaw.w3.org/css-validator/



- Choose file upload tab
- Browse to HTML document containing CSS code and select Check button

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Result

- Successful validation

W3C CSS Validator results for internal.html (CSS level 3)

Congratulations! No Error Found.

This document validates as CSS level 3 !

- Unsuccessful validation

W3C CSS Validator results for internal.html (CSS level 3)

Sorry! We found the following errors (3)

URI : internal.html

8	h1	Value Error : color Parse Error color
8	h1	Parse Error ;#FF0000;
8	h1	Parse Error ;}

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FORM VALIDATION

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Forms using HTML5

- Prior to HTML5, form validation was done using Javascript code
- However, one of the features of HTML5 is a wide range of new input types for forms
- These allow better input control and validation
- Variable support across browsers
- Currently Google Chrome supports more of these new features

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New input types

- color
- date
- datetime
- month
- time
- week
- month
- email
- number
- range
- search
- tel
- url

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color / date

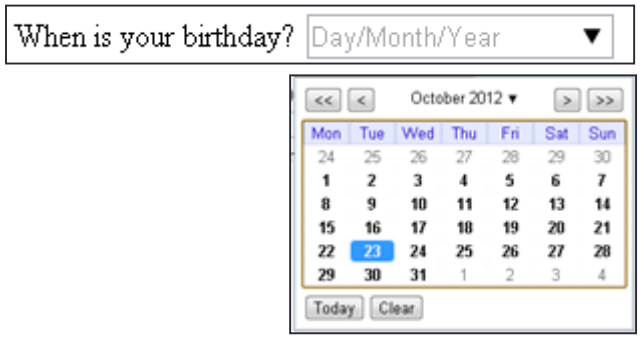
- color type allows user to select a colour from the colour picker

```
<label for="colour">Select your favorite color:</label>
<input type="color" name="colour" id="colour"><br />
```

- Chrome

```
<label for="bday">When is your birthday?</label>
<input type="date" name="bday" id="bday"><br />
```

- date type allows user to select a date from a calendar



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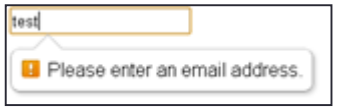
email / number

- email type used for fields that should contain an email address
- It will be automatically validated when submitted

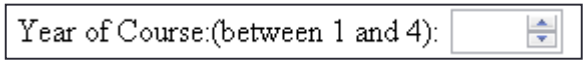
```
<label for="email">Email address:</label>
<input type="email" name="email" id="email" title="Please enter an email address">
```



- number type used for fields that should contain numbers

```
<label for="year">Year of Course using number type:(between 1 and 4):</label>
<input type="number" name="year" id="year" min="1" max="4"><br />
```

- This will only allow user to select a valid number



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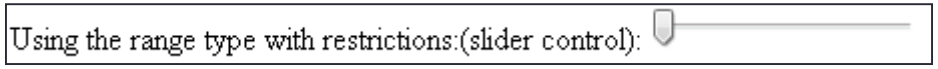
range

- range type used for fields that should contain a value from a range of values

```
<label for="year2">Using the range type with restrictions:(slider control):</label>
<input type="range" name="year2" id="year2" min="0" max="10" step="2" value="0"><br />
```

- Note other attributes used: min, max, step, value (default value)



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url

- url type used for fields that should contain a URL address
- Value of the url is automatically validated when the form is submitted

```
<label for="hpage">Home page</label>
<input type="url" name="hpage" id="hpage" title="Please enter a url">
```

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New Form Elements

- HTML5 also has some new form elements
- **<datalist>**
- The <datalist> element specifies a list of pre-defined options for an <input> element
- It is used to provide an autocomplete feature on <input> elements
- Users will see a drop-down list of pre-defined options as they input data

```
<datalist id="browsers">
  <option value="Internet Explorer">
  <option value="Firefox">
  <option value="Chrome">
  <option value="Opera">
  <option value="Safari">
</datalist>
```

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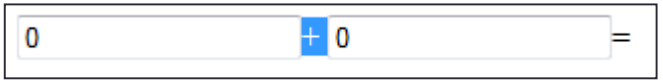
output

- The <output> element represents the result of a calculation

```
<form oninput="x.value=parseInt(a.value)+parseInt(b.value)">
<input type="number" name="a" value="0">+
<input type="number" name="b" value="0">=
<output name="x" for="a b"></output>
</form>
```

- As soon as user enters a value in an input field, the result of the calculation is displayed:



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New Form Attributes

- New attributes for <form>
  - autocomplete
  - novalidate
- New attributes for <input>
  - autocomplete
  - autofocus
  - form
  - multiple
  - pattern
  - placeholder
  - required
  - And more

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autocomplete

- Used to specify whether a form or input field should have autocomplete on or off
- On means the browser automatically completes values based on values user has entered before
- Works with the following input types: text, search, url, tel, email, password, datepickers, range and color
- It is possible to have autocomplete "on" for the form, and "off" for specific input fields, or vice versa

```
<form action ="" autocomplete="on">
  First name:<input type="text" name="fname"><br>
  Last name: <input type="text" name="lname"><br>
  E-mail: <input type="email" name="email" autocomplete="off"><br>
  <input type="submit">
</form>
```

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novalidate / placeholder

- The novalidate attribute is a boolean attribute.
- It specifies that the form-data (input) should not be validated when submitted.

```
<form action="demo.asp" novalidate>
  E-mail: <input type="email" name="user_email">
  <input type="submit">
</form>
```

- The placeholder attribute specifies a short hint that describes the expected value of an input field.

```
<input type="text" name="fname" placeholder="First name">
```

- Displays

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autofocus / multiple

- The autofocus attribute is a boolean attribute.
- It specifies that an <input> element should automatically get focus when the page loads.

```
<form action="demo.asp">
First name:<input type="text" name="fname" autofocus>
Last name:<input type="text" name="lname">
E-mail: <input type="email" name="user_email">
<input type="submit">
</form>
```

- The multiple attribute is a boolean attribute.
- It specifies that the user is allowed to enter more than one value in the <input> element.
- Works with email and file types.

```
<form action="demo.asp">
  Select images: <input type="file" name="img" multiple>
  <input type="submit">
</form>
```

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required / min / max

- The required attribute is a boolean attribute.
- It specifies that an input field must be filled out before submitting the form.

```
Username: <input type="text" name="usrname" required>
```

- The min and max attributes specify the minimum and maximum value for an <input> element.

```
<form action="demo.asp">
  Enter a date before 2013-12-31:
  <input type="date" name="bday" max="2013-12-31"><br>
  Enter a date after 2013-01-01:
  <input type="date" name="bday" min="2013-01-01"><br>
  Quantity (between 1 and 5):
  <input type="number" name="quantity" min="1" max="5">
  <input type="submit">
</form>
```

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pattern

- Used to accept only certain characters
- Specifies a regular expression that the <input> element's value is checked against when the form is submitted
- Works with the following input types: text, search, url, tel, email and password

```
<input type=text name=pattern pattern="[0-9][A-Z]{3}">
```

specifies a single digit followed by three uppercase letters

```
  <input type="text" name="code" pattern="[A-Za-z]{3}[0-9]{2}" title="3 letters
followed by 2 digits">
```

specifies 3 letters followed by two digit

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GRAPHICS / IMAGES

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Graphics

- The Web is about more than text and information
- It is also a medium for expressing artistic creativity and data visualization
- Graphics can optimise the presentation of information for different audiences with different needs and expectations.
- Can enhance the experience for users
- W3C has several different and complementary technologies that work together with HTML

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Graphics

- Web graphics are visual representations used on a Web site to enhance or enable the representation of an idea or feeling, in order to reach the Web site user.
- Graphics may entertain, educate, or emotionally impact the user
- Crucial to the strength of branding, clarity of illustration, and ease of use for interfaces.
- Photographs, diagrams, maps, bar charts, designs and patterns, flowcharts, and many other image forms

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Image Manipulation and Graphic Design

- Graphic Design
  - What is it?
  - The ability to create a graphic, text, image layout in a web document.

- Image Manipulation
  - What is it? The art of combining, cropping, correcting, restoring, and blending photographs or original artwork.
  - Compressing files for onward use.

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Making changes

- Manipulation of created or existing images
  - Layering
  - Rotating
  - Stretching
  - Blurring
  - Resizing
  - Twirling etc
- Add/remove objects to image
- Combining multiple images into one
- Changing tone/background
- Adding special effects such as:

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Software

- Free
  - GIMP
  - Picasa
  - Inkscape
  - Paint
- Commercial
  - Photoshop
  - Fireworks

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Types of Images

- Bitmap graphics
  - Pixel based
  - Defined as a rectangular grid of Pixels
  - Resolution dependent
  - Zooming will lose quality and detail
- Vector based
  - Defined mathematically
  - Resolution independent
  - Zooming will not affect quality

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Resolution

- Dots on a screen
  - The more dots the bigger the file size and normally better quality of images, but slower to load on the web.

LOW-RESOLUTION HIGH-RESOLUTION

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Optimisation

- Optimisation is reducing or compressing the image. This effects quality, file size and bit depth via image compression algorithms
- Two Types
  - Lossless and lossy compression
  - Lossless and lossy compression are terms that describe whether or not, in compressing a file, all original data can be recovered when the file is uncompressed.
- Some file formats use only one type of compression
- Others may use either methods

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Image Compression

Lossless

- tiff, bmp, png
- Use algorithms that save the image with maximum image quality
- Quality will be preserved
- However bigger file size

Lossy

- jpg
- Loses information
- Smaller file size
- Loses information when it is saved
- The amount of lost information influences the size of the file
- When saved, cannot go back to the previous state

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File formats

- There are various formats for images on the web.
- Important criteria is file size.
- Specific formats
  - GIF
  - JPEG
  - PNG
  - SVG

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GIF

- Graphics Interchange Format
- Good for creating very low resolution files
- Extension - gif
- Supports transparency
- Progressive loading - interlacing
- Lossless compression
- Good results for diagrams
- Limited to 256 colours
- Unsuitable for digital photography
- Suited to simpler images such as graphics or logos with solid areas of colour

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JPEG

- Joint Photographic Experts Group
- Extension – jpeg, jpg
- Can be relatively small in size
- Excellent compression for natural images
- Supports up to 16.7 million colours
- Ideal for complex images and photographs
- Lossy compression causes variable quality results
- No transparency
- Poor compression on diagrammatic images
- Unsuitable for line drawings and other textual or iconic graphics, where there is sharp contrasts

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PNG

- Portable Networks Graphic
- Static file format
- Extension – png
- Developed to build upon the purpose of gifs
- Developed by PNG Development Group (donated to W3C) to surpass the limitations of GIFs
- Provides greater depth of color, catering to images up to 24 bit in color
- Does not support animation
- Excellent lossless compression of diagramatic images
- Does not compress natural images well

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SVG

- Scalable Vector Graphics
- Defines vector-based graphics for the Web
- Defines the graphics in XML format
- Does NOT lose any quality if they are zoomed or resized
- SVG is a W3C recommendation
- Extension - svg
- Fully scalable
- Embed SVG into html document

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Considerations for Images

- Number of images
- Images are stored separately from .html file so if 10 images on web page, 11 files
- Format type / browser support
- Size of the images – no larger than necessary
- Download time / bandwidth
- Decrease image's file size
  - Resize the image before it is uploaded onto the web site
  - Use thumbnails when using lots of images
  - Choose an appropriate image format

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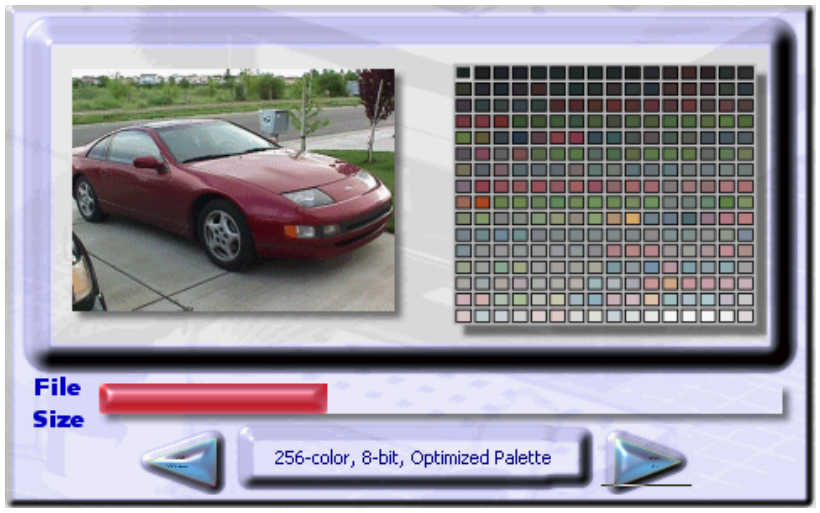
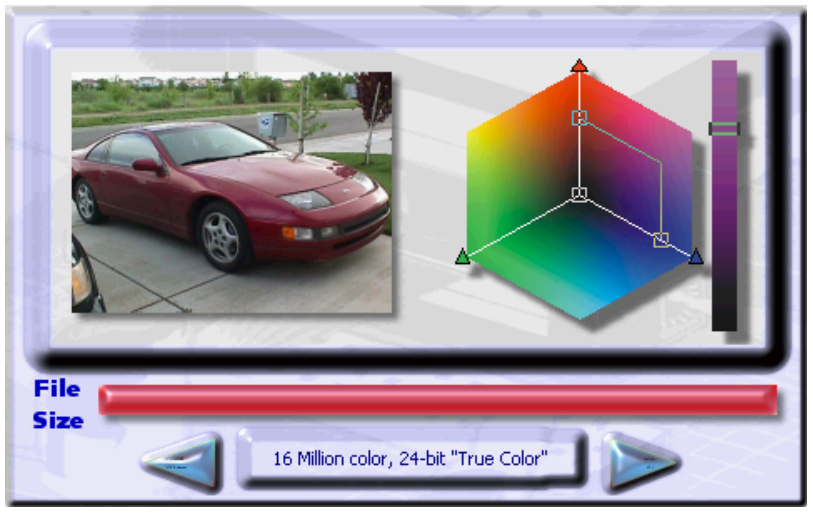
Example





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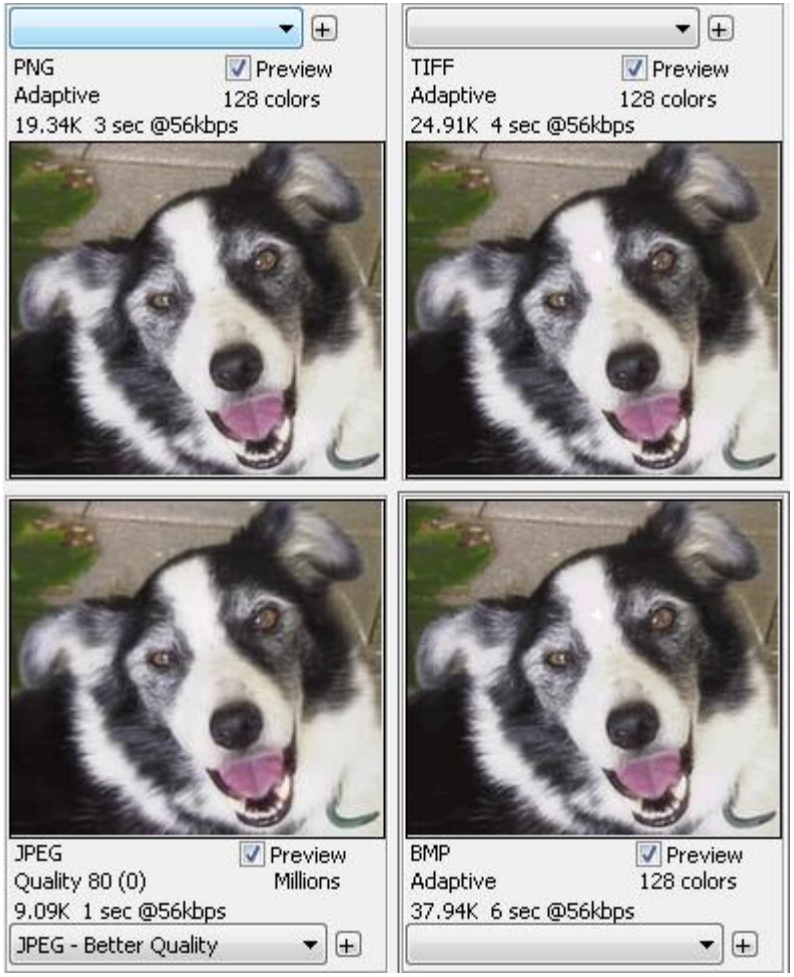
Example in Fireworks

- Formats
- Sizes
- Quality
- Download time



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SVG

- SVG Shapes such as:
  - Rectangle
  - Circle
  - Polygon
  - Ellipse
- SVG Filters such as:
  - Blur effects
  - Drop shadows
- SVG Gradients such as:
  - Linear
  - Radial

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SVG - Examples

- Circle
  - cx and cy are the coordinates of the center of the circle
  - r defines the radius
- Rectangle
  - x defines the number of pixels from the left margin
  - y defines the number of pixels from the top margin
- Polygon
  - contains at least three straight lines
  - points attribute defines the x and y coordinates for each corner of the polygon
  - Shape is closed as all lines connect up

```
<svg xmlns="http://www.w3.org/2000/svg" version="1.1">
 <circle cx=100 cy=50 r=40 />
 <rect x=10 y=100 width=300 height=100 />
 <polygon points="10,400 210,350 100,220" />
</svg>
```

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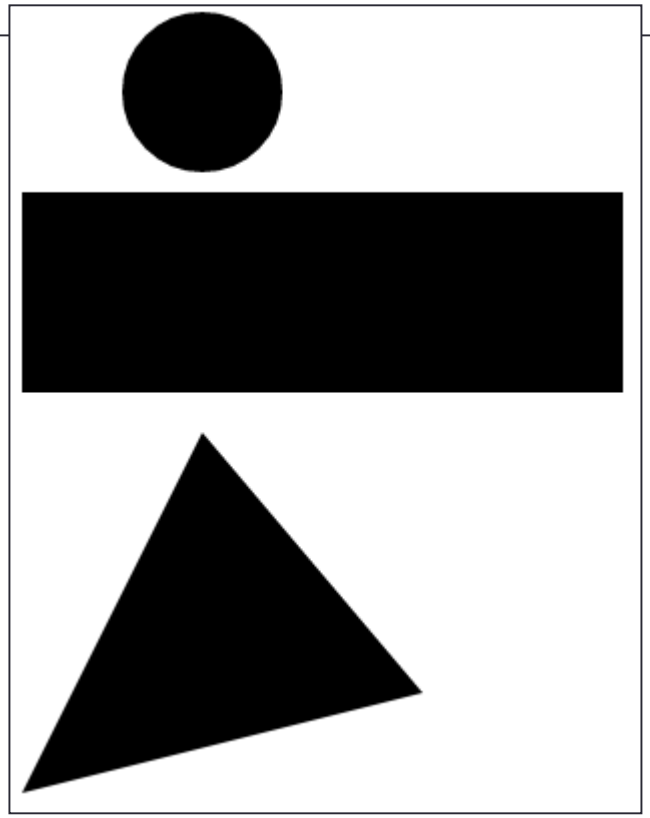
SVG - Example

```
<svg xmlns="http://www.w3.org/2000/svg" version="1.1">
 <circle cx=100 cy=50 r=40 />
 <rect x=10 y=100 width=300 height=100 />
 <polygon points="10,400 210,350 100,220" />
</svg>
```



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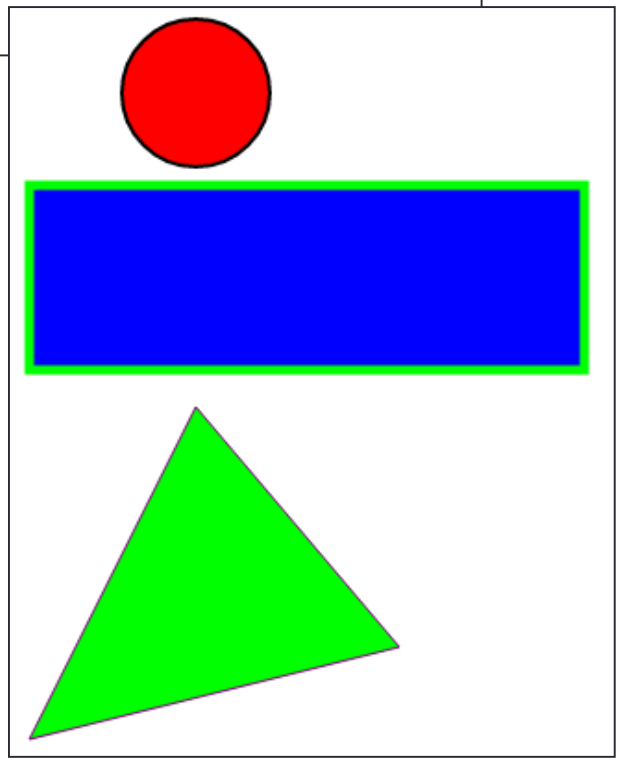
SVG – Adding attributes

```
<svg xmlns="http://www.w3.org/2000/svg" version="1.1">
 <circle cx=100 cy=50 r=40 stroke="black" stroke-width="2"
fill="red"  />
 <rect x=10 y=100 width=300 height=100
style="fill:rgb(0,0,255);stroke-width:5;stroke:rgb(0,255,0)" />
 <polygon points="10,400 210,350 100,220"
style="fill:lime;stroke:purple;stroke-width:1" />
</svg>
```

- Colour specified as rgb values and names



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Canvas

- <canvas> element new in HTML5
- Rectangular area on an HTML document
- Used to draw graphics
- <canvas> element is only a container for graphics
- A script is used to actually create the graphic
- By default, it has no border and no content
- Markup looks like:
- <canvas id="myCanvas" width="200" height="300"></canvas>

- http://www.w3schools.com/tags/ref_canvas.asp

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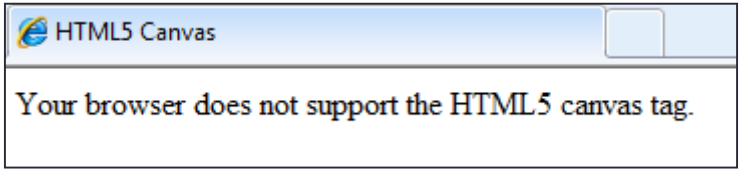
Example

```
<!DOCTYPE html>
<html>
<body>

<canvas id="myCanvas" width="200" height="100"
style="border:1px solid #000000;">
Your browser does not support the HTML5 canvas tag.
</canvas>

</body>
</html>
```

- IE supports the <canvas> element from version 9
- Previous versions produce:



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Example

- Draw onto the canvas using javascript
- Javascript will be covered later in the module

```
<!DOCTYPE html>
<html>
<body>

<canvas id="myCanvas" width="200" height="100"
style="border:1px solid #c3c3c3;">
Your browser does not support the HTML5 canvas tag.
</canvas>

<script>

var c=document.getElementById("myCanvas");
var ctx=c.getContext("2d");
ctx.fillStyle="#FF0000";
ctx.fillRect(0,0,150,75);

</script>

</body>
</html>
```

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Canvas vs SVG

Canvas

- Resolution dependent
- No support for event handlers
- Poor text rendering capabilities
- You can save the resulting image as .png or .jpg
- Well suited for graphic-intensive games

SVG

- Resolution independent
- Support for event handlers
- Best suited for applications with large rendering areas (Google Maps)
- Slow rendering if complex (anything that uses the DOM a lot will be slow)
- Not suited for game applications

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Lab

- Check that you are up-to-date with earlier labs.
- Remember there are more CSS examples in week 6.

- Lab on Moodle
- Check the validation of your pages
  - HTML validator
  - CSS validator
- Examples on Moodle:
  - Validation
  - Forms
  - SVG/canvas