HTML, CSS

Topic 2

CMPT 350

HTML

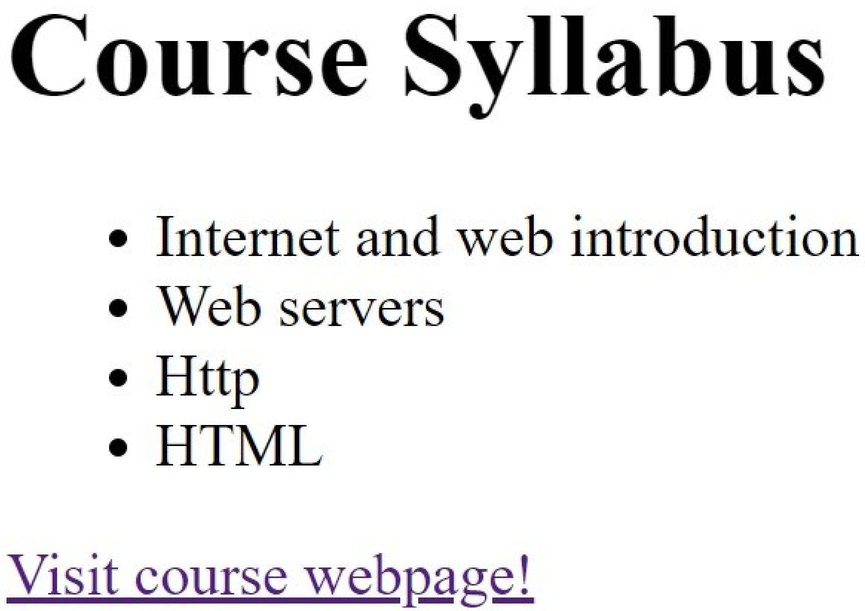
- Marked up language for designing the content and structure of a web page; not a programming language
- Consists of a series of elements
- elements tell the browser how to display the content
- elements are represented by tags

```
<!DOCTYPE html>
<html>
<head>
<title>Title of the web page</title>
</head>
<body>
<h1>This is a Heading</h1>
<p>This is a paragraph.</p>
</body>
</html>
```

HTML basic elements

- A text header, defined using the <h1>, <h2>, <h3>, <h4>, <h5>, <h6> tags.
- A paragraph, defined using the <p> tag.
- A horizontal ruler, defined using the <hr> tag.
- A link, defined using the <a> (anchor) tag.
- A list, defined using the <ul> (unordered list), <ol> (ordered list) and <li> (list element) tags.
- An image, defined using the <img> tag
- A divider, defined using the <div> tag
- A text span, defined using the <span> tag
- A line break, defined using the <br> tag

```
<!DOCTYPE html>
<html>
  <head>
     <title> CMPT 350 </title>
  </head>
  <body>
    <h1> Course Syllabus </h1>
    <ul>
         <li>Internet and web introduction </li>
         <li>Web servers</li>
         <li>Http</li>
         <li>HTML</li>
    </ul>
    <a href= https://catalogue.usask.ca/CMPT-350>
         Visit course webpage! </a>
</body>
</html>
```



Course Syllabus

- Internet and web introduction
- Web servers
- Http
- HTML

Visit course webpage!

XHTML (Extensible Hypertext Markup Language)

- XHTML is almost identical to HTML, but it is cleaner and stricter than HTML.
- XHTML use the advantages of both HTML and XML. Also, XHTML pages can be rendered by all XML enabled browsers.
- If the document is served with a Content-type: text/html header it will be treated as HTML if the Content-type: application/xml+xhtml header it will be treated as XHTML.

XHTML Document Structure

- XHTML DOCTYPE is mandatory.
- The xmlns attribute (xml namespace) in <html> is mandatory.
- <html>, <head>, <title>, and <body> are mandatory.

XHTML Elements

- XHTML elements must be properly nested.
- XHTML elements must always be closed.
- XHTML elements must be in lowercase.

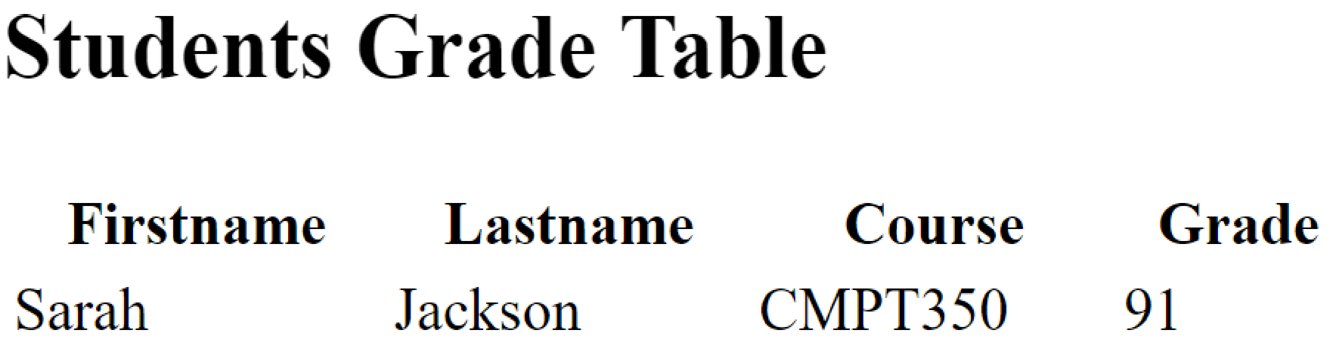
XHTML Attributes

- Attribute names must be in lower case.
- Attribute values must be quoted.
- Attribute minimization is forbidden.

HTML tables

- <table> tag defines the table.
- <tr> tag is used to define the table row.
- <th> tag is used to define the table header.
- <td> tag is used to define the table data/cell.

```
<h2>Students Grade Table</h2>
<table style="width:50%">
 <tr>
  <th>Firstname</th>
  <th>Lastname</th>
  <th>Course</th>
  <th>Grade</th>
 </tr>
 <tr>
  <td>Sarah</td>
  <td>Jackson</td>
  <td>CMPT350</td>
  <td>91</td>
 </tr>
</table>
```



Students Grade Table

Firstname	Lastname	Course	Grade
Sarah	Jackson	CMPT350	91

HTML Form

The HTML <form> element defines a form that is used to collect data from user input.

<form>

form elements

</form>

The <input> Element

- The <input> element depends on the type of the attribute.

```
<input type="text">
<input type="radio">
<input type=“submit">
<input type="checkbox">
<input type="date">
<input type="number">
```

…

HTML Frames

- Displaying more than one document at a time.
- Each frame is capable of displaying its own document.
- <frameset> specifies the number of frames and their layout
- <frameset> includes two attributes, rows and cols with three types of values numbers (height in pixel), percentages (percentage of the total browser window) and asterisks (the remainder of the window height).
- <frame> with src attribute that represents the filename of a document.
- <frame src = “frame-1.html”>

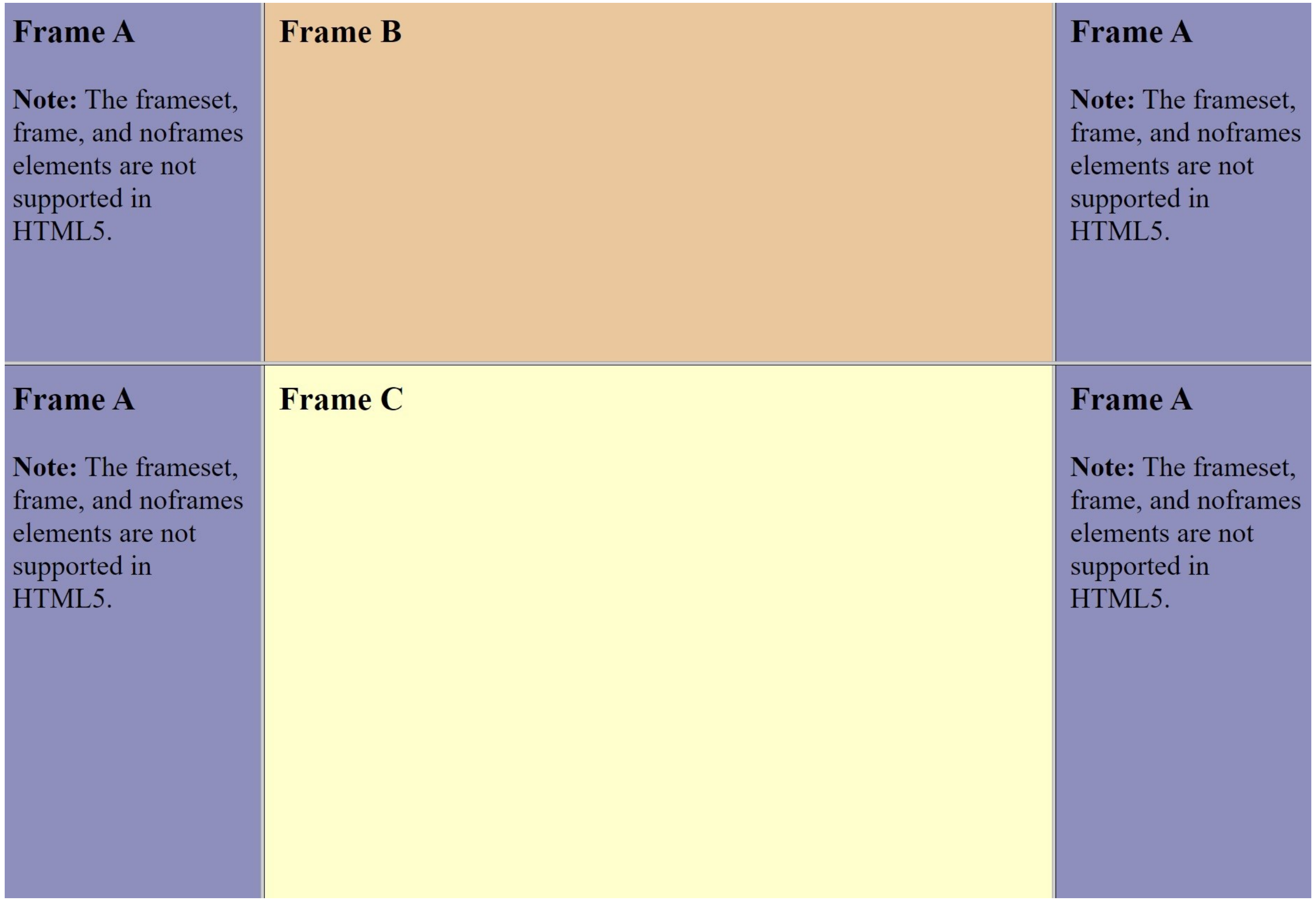
```
<!DOCTYPE html>

<html>

<frameset  rows="60, 100"
cols="20%,*,20%">
        <frame src="frame_a.htm">
        <frame src="frame_b.htm">
        <frame src="frame_a.htm">
        <frame src="frame_a.htm">
        <frame src="frame_c.htm">
        <frame src="frame_a.htm">

</frameset>

</html>
```



Frame A

Note: The frameset, frame, and noframes elements are not supported in HTML5.

Frame B

Frame A

Note: The frameset, frame, and noframes elements are not supported in HTML5.

Frame A

Note: The frameset, frame, and noframes elements are not supported in HTML5.

Frame C

Frame A

Note: The frameset, frame, and noframes elements are not supported in HTML5.

HTML5

- Simplifying the DOCTYPE declaration

  HTML4 → <!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01//EN"
  "http://www.w3.org/TR/html4/strict.dtd">

  HTML5 → <!DOCTYPE html>

HTML5

- New semantic elements
- Semantic HTML elements clearly describe it's meaning in a human and machine-readable way.

  Such as <header>, <footer>, <mark>, <nav>, <section>, <time>

HTML5 Multimedia support (audio and video)

- <audio> support and play sound files in three format:

  .mp3

  .wav

  .ogg

  ```
  <audio src=“music.mp3" autoplay></audio>
  ```

- <video>

  .mp4

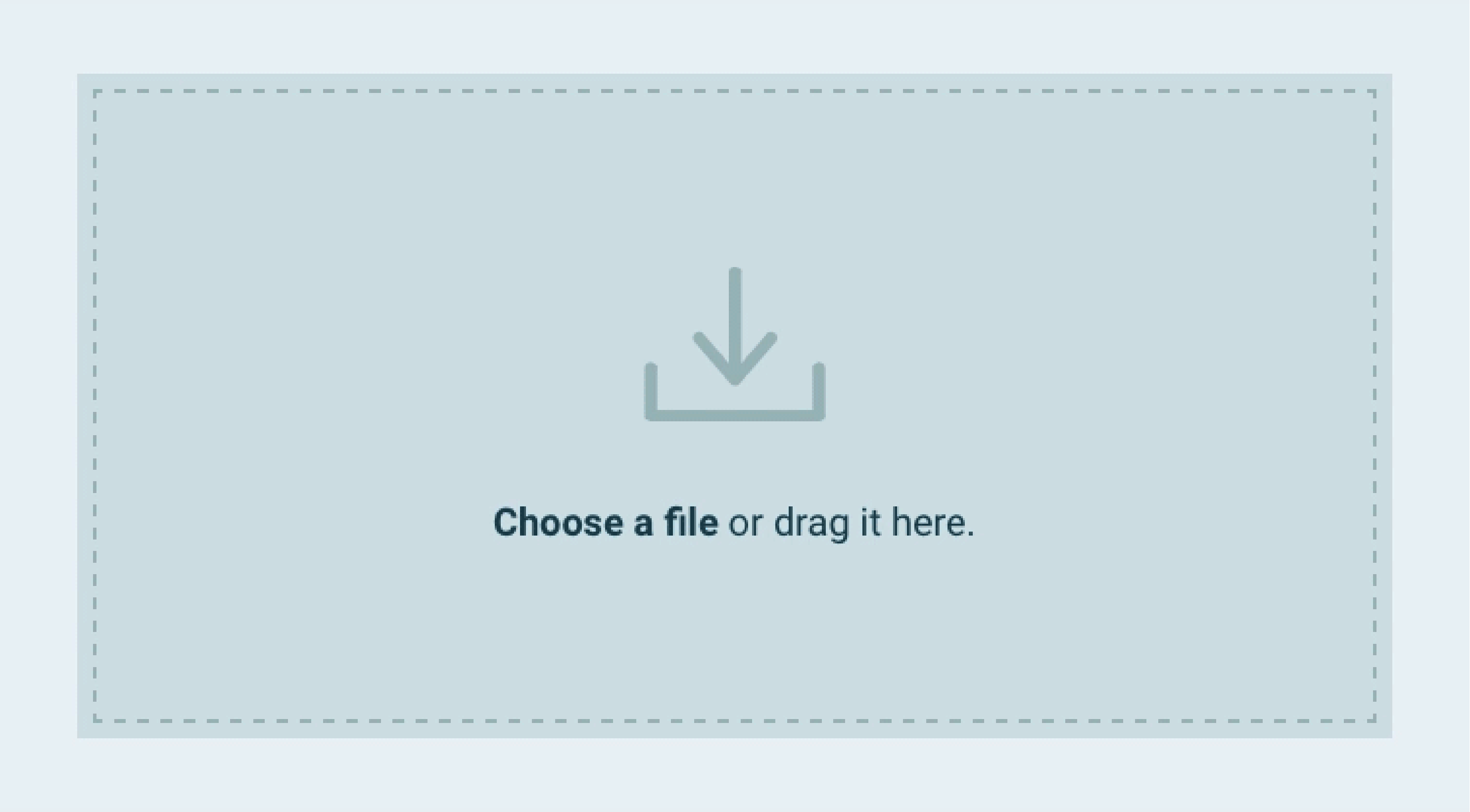
  .webm

  .ogg

  ```
  <video width="320" height="240" autoplay>
   <source src="movie.mp4" type="video/mp4">
   </video>
  ```

HTML5 supports for drag and drop

- It is part of HTML5 standard.



Choose a file or drag it here.

HTML5 canvas

- The <canvas> element is used to draw graphics via JavaScript
- It is only a container for graphics. For drawing the graphics you must use JavaScript.

HTML 5 Server-Sent Events (SSE)

- A server-sent event is when a web page automatically gets updates from a server.
- Polling vs SSE
- Examples: Facebook/Twitter updates, stock price updates, news feeds, etc.

HTML5 Local Data Storage / web storage

- With HTML5 we can store data locally within the user’s browser.
- It is more secure than storing data in cookies and the storage limit is far larger.

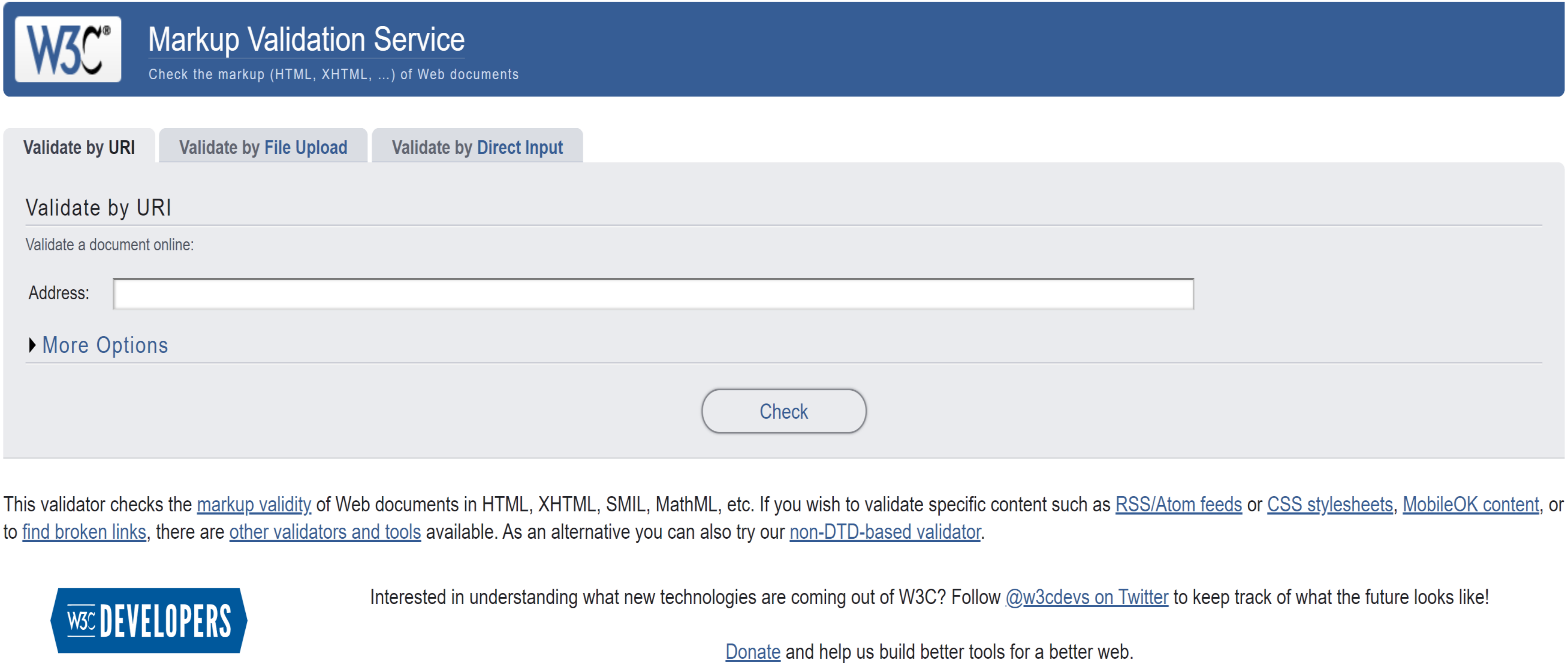
HTML5 offline applications

- Users can continue to work with the web application even they lose internet connection.
- Known as HTML Application Cache
- Offline application is a package of web pages, CSS and script files that saved on the user’s machine in the application cache.
- Application manifest: a text file that maintains resources (files) that the browser should cache for your application.

```
<html manifest="example.appcache">
…
</html>
```

W3C HTML Validator

- https://validator.w3.org/
- Checks the HTML code to make sure it follows the standard HTML syntax.
- Not only validates HTML but also it validates Web documents in XHTML, MathML, etc.

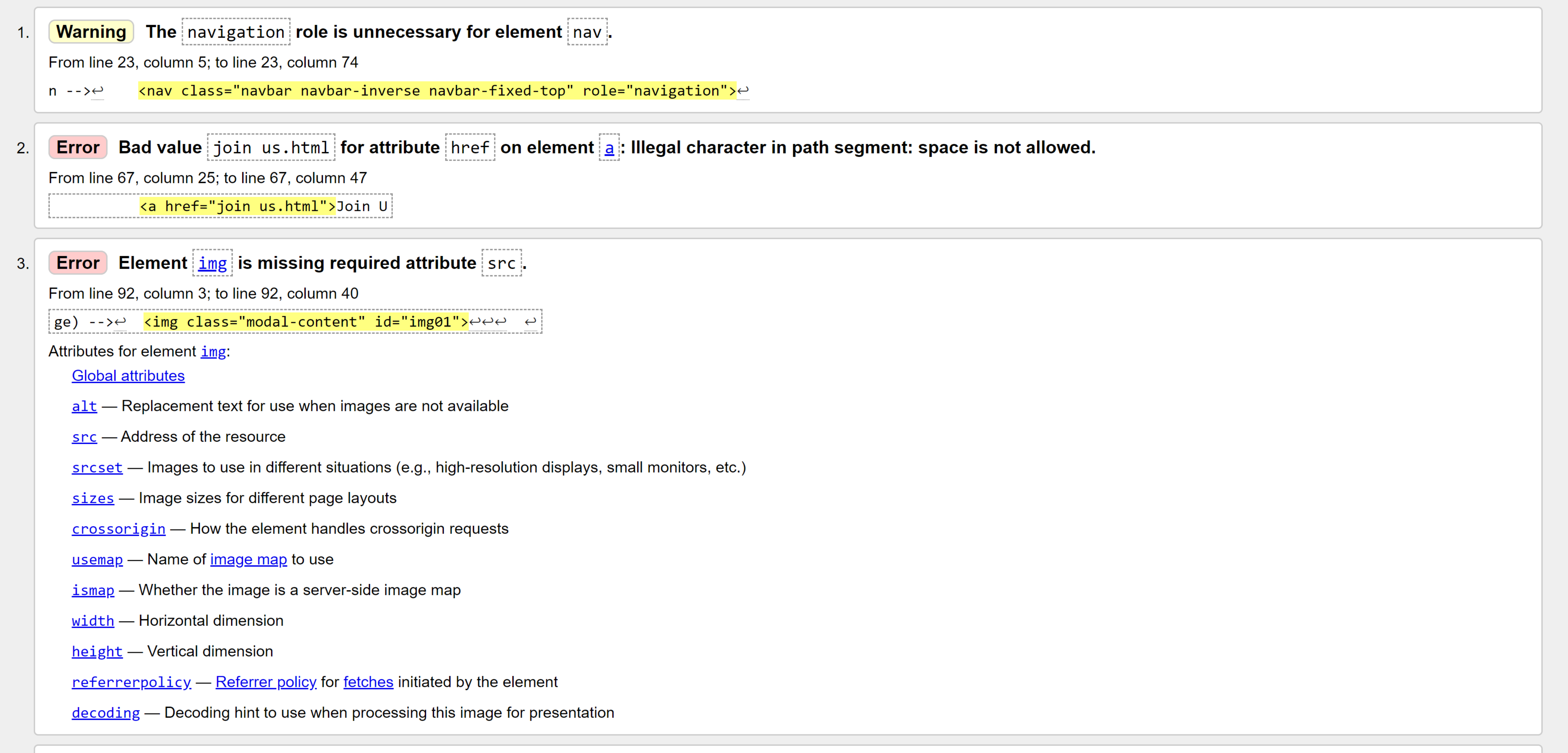


Validate a document online:

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.

Interested in understanding what new technologies are coming out of W3C? Follow @w3cdevs on Twitter to keep track of what the future looks like!

Donate and help us build better tools for a better web.



1. **Warning** **The `navigation` role is unnecessary for element `nav`.**

   From line 23, column 5; to line 23, column 74

   ```
   n -->↩    <nav class="navbar navbar-inverse navbar-fixed-top" role="navigation">↩
   ```

2. **Error** **Bad value `join us.html` for attribute `href` on element `a`: Illegal character in path segment: space is not allowed.**

   From line 67, column 25; to line 67, column 47

   ```
              <a href="join us.html">Join U
   ```

3. **Error** **Element `img` is missing required attribute `src`.**

   From line 92, column 3; to line 92, column 40

   ```
   ge) -->↩  <img class="modal-content" id="img01">↩↩↩  ↩
   ```

   Attributes for element `img`:

   Global attributes

   `alt` — Replacement text for use when images are not available

   `src` — Address of the resource

   `srcset` — Images to use in different situations (e.g., high-resolution displays, small monitors, etc.)

   `sizes` — Image sizes for different page layouts

   `crossorigin` — How the element handles crossorigin requests

   `usemap` — Name of image map to use

   `ismap` — Whether the image is a server-side image map

   `width` — Horizontal dimension

   `height` — Vertical dimension

   `referrerpolicy` — Referrer policy for fetches initiated by the element

   `decoding` — Decoding hint to use when processing this image for presentation

CSS History

- In October 1994, Tim Berners-Lee formed the World Wide Web Consortium (W3C), which is the standards organization for the web.
- Hakon Wium Lie released the first draft of “Cascading HTML Style Sheets” in 1994.
- Almost three years later, Internet Explorer was the first browser that supported CSS.

CSS (Cascading Style Sheets)

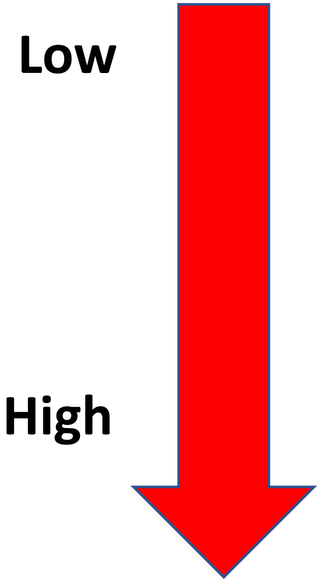
- Describes the appearance and layout of a web page.
- CSS describes how HTML elements are to be displayed on a web page.
- Composed of CSS rules, which define sets of styles.
- CSS saves much work. You define rules once, and it can control the layout of multiple web pages all at once.

https://www.w3schools.com/css/css_intro.asp

CSS → Cascading + Style Sheets

- Style Sheet: A set of rules that define how the HTML elements display in the browser.
- The Cascade part is for resolving conflicts between rules that are applied to the same element. Cascade is a mechanism that defines which rule applies when there is a conflict.

Stylesheet order ranking



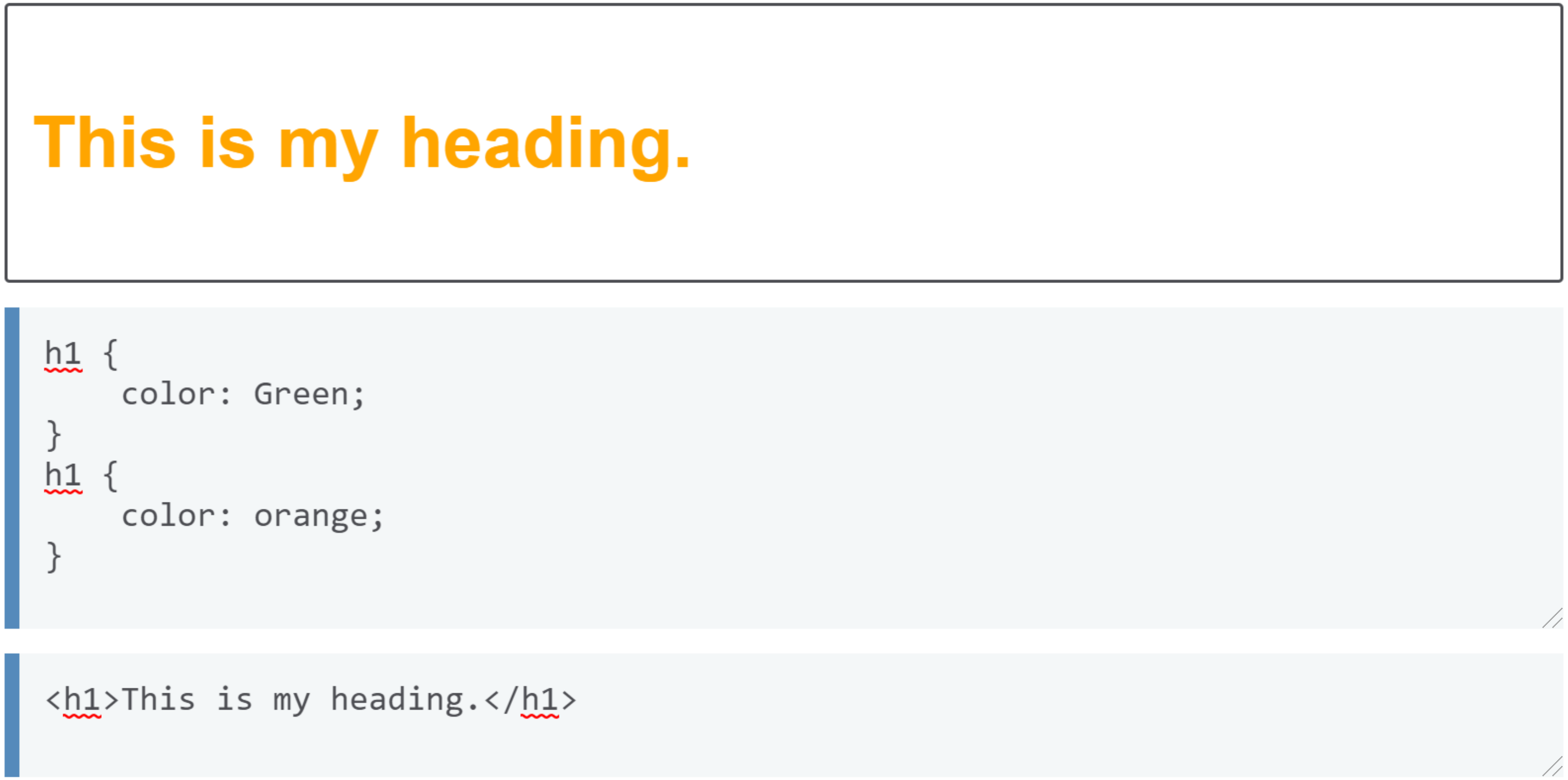
Low

High

- Browser stylesheet
- External stylesheet
- Internal stylesheet (Embedded <head>)
- Inline stylesheet

The Cascade last rule

At a simple level, the order matters, which means the rule that comes last will be the winner of the cascade conflict.



This is my heading.

```
h1 {
    color: Green;
}
h1 {
    color: orange;
}
```

```
<h1>This is my heading.</h1>
```

Cascade Inheritance

Inheritance propagates property values from parent elements to their children.

No rule defines what properties are inherited or not, but the general rule is that text-related properties are inherited, and layout-related are not.

```
<div> → parent of ul and li
        <ul> → parent of li
                <li></li>  ┐
                           ├    ul children
                <li></li>  ┘
        </ul>
</div>
```

A CSS rule-set consists of a selector and a declaration block:

```
selector {
        property: value;
        property: value;
        …
}
```

Declaration

selector: Specifies the HTML element(s) to style.

property: the name of the CSS style.

value: the value for the CSS style.

```
.ghost{
  color: white;
  opacity: 0.1;
}
```

CSS selectors

- Element selector

  <p> it effects all p elements

- ID selector

  #IDName element with id="IDName"

- Class selector

  .className elements with class="className"

```
p {
        color: blue;
        font-size: 12px;
        background-color: lightblue;
}

h1 {
        color: red;
        font-weight: bold;
        text-align: center;
}
```

```
#select1 {
  text-align: center;
  font-family: Arial;
  font-style: italic
  color: red;
}

<h2 id= “select1” > This header is in select1 style </h2>
```

```
.classA {
  text-align: center;
  font-family: Arial;
  font-style: italic
  color: red;
}
```

```
<h2 class= “classA” > This header is in classA style </h2>
```

The CSS Universal Selector

The universal selector (*) selects all elements on the page.

```
* {
  property: value;
  property: value;
}
```

CSS properties

- color
- font
- text
- image

CSS properties for colors

- color of an element’s text

  ```
  color: value;
  ```

- color that will appear at the background of the element

  ```
  background-color: value;
  ```

Three ways to specify the color:

1. Color name red, blue, …
   color: brown;
1. RGB code: Red , Green, Blue from 0 to 255
   color: rgb(178, 12, 201);
1. Hex code: RGB values in base-16 from 00 to FF
   color: #E9967A

HTML Color Values:

https://www.w3schools.com/colors/colors_hex.asp

CSS properties for font

font	Sets all the font properties in one declaration font: italic bold 12px/30px Georgia, serif;
font-family	Specifies the font family for text font-family: Georgia, serif;
font-size	Specifies the font size of text font-size: 15px; font-size: large;
font-style	enable/disable italic style font-style: italic; font-style: normal;
font-weight	Specifies the weight of a font, enable/disable bold font-weight: bold; font-weight: 850;

CSS Text

- Text Color
- Text Alignment

  text-align: center;

  text-align: left;

  text-align: right;

  text-align: justify;
- Text Decoration

  text-decoration: overline;

  text-decoration: line-through;

  text-decoration: underline;

- Text Transformation

  text-transform: uppercase;

  text-transform: lowercase;

  text-transform: capitalize;

- Letter Spacing

  letter-spacing: 2px;

  letter-spacing: -2px;

CSS images

Image center

- To center an image set the left and right margin to auto and display it into a block element.

```
img {
  display: block;
  margin-left: auto;
  margin-right: auto;
}
```

Responsive images

Responsive image automatically adjusts to fit the screen.

```
.responsive{
  width: 100%;
  height: auto;
}
```

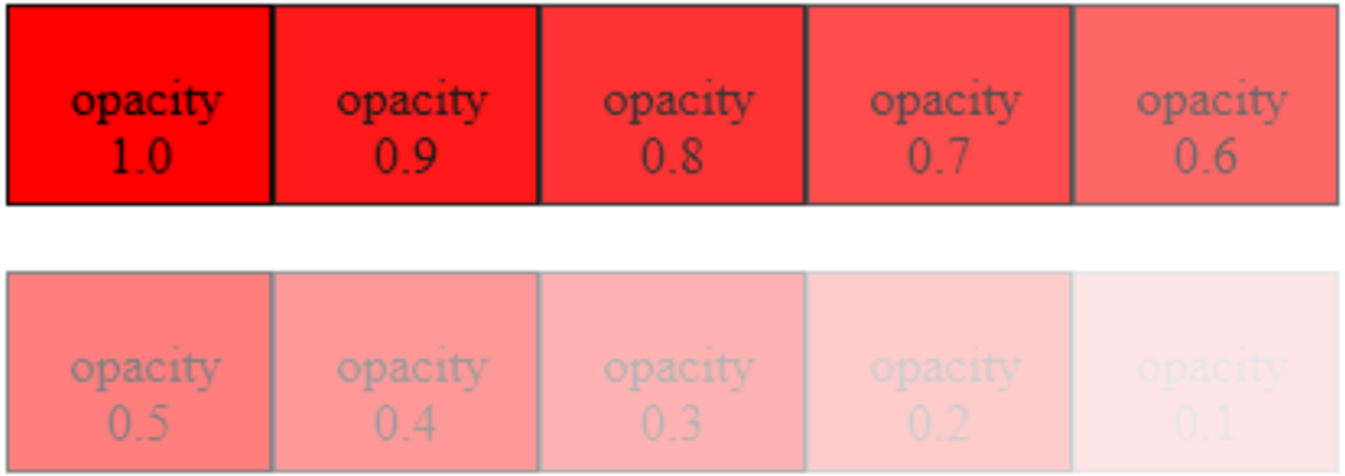
Scale down

```
.responsive {
  max-width: 100%;
  height: auto;
}
```

CSS image opacity

- specifies the opacity/transparency of the element.
- can take a value between 0.0 and 1.0.

```
img {
        opacity: 0.5;
}
```



http://www.corelangs.com/css/box/transparent.html

Link CSS in HTML

CSS can be embedded in HTML or placed into separate .css file

✓

```
<head>
…
<link type= “text/css"  rel="stylesheet"
href="filename.css" />
…
 </head>
```

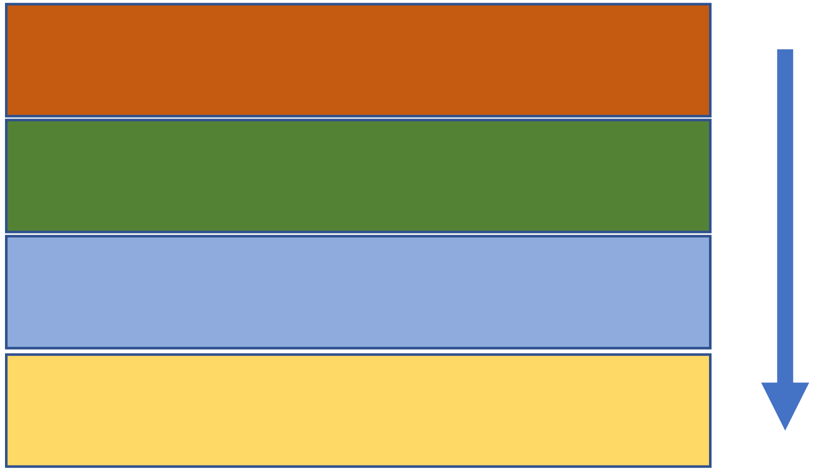
✗

```
<head>
…
<style type="text/css">
p { font-family: Georgia, serif; color: red; }
h2 { background-color: black; }
</style>
…
</head>
```

HTML Block

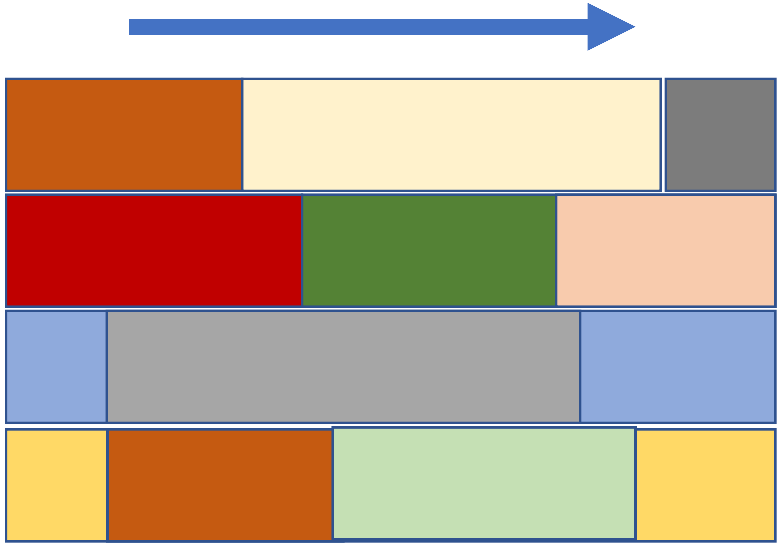
- A block-level element always starts on a new line and takes up the full width of the page.
- large blocks of content that have height and width
- It can contain another block-level as well as inline elements.

Examples: <p>, <h1>, <blockquote>, <ol>, <ul> <div>



HTML inline

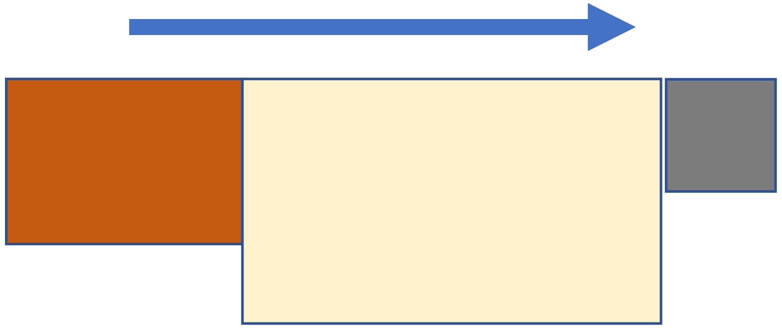
- An inline element does not start on a new line and only takes up as much width as it needs.
- It can contain data and other inline elements.
- Examples: <a>, <em>, <strong>, <br> <span>



Inline-block

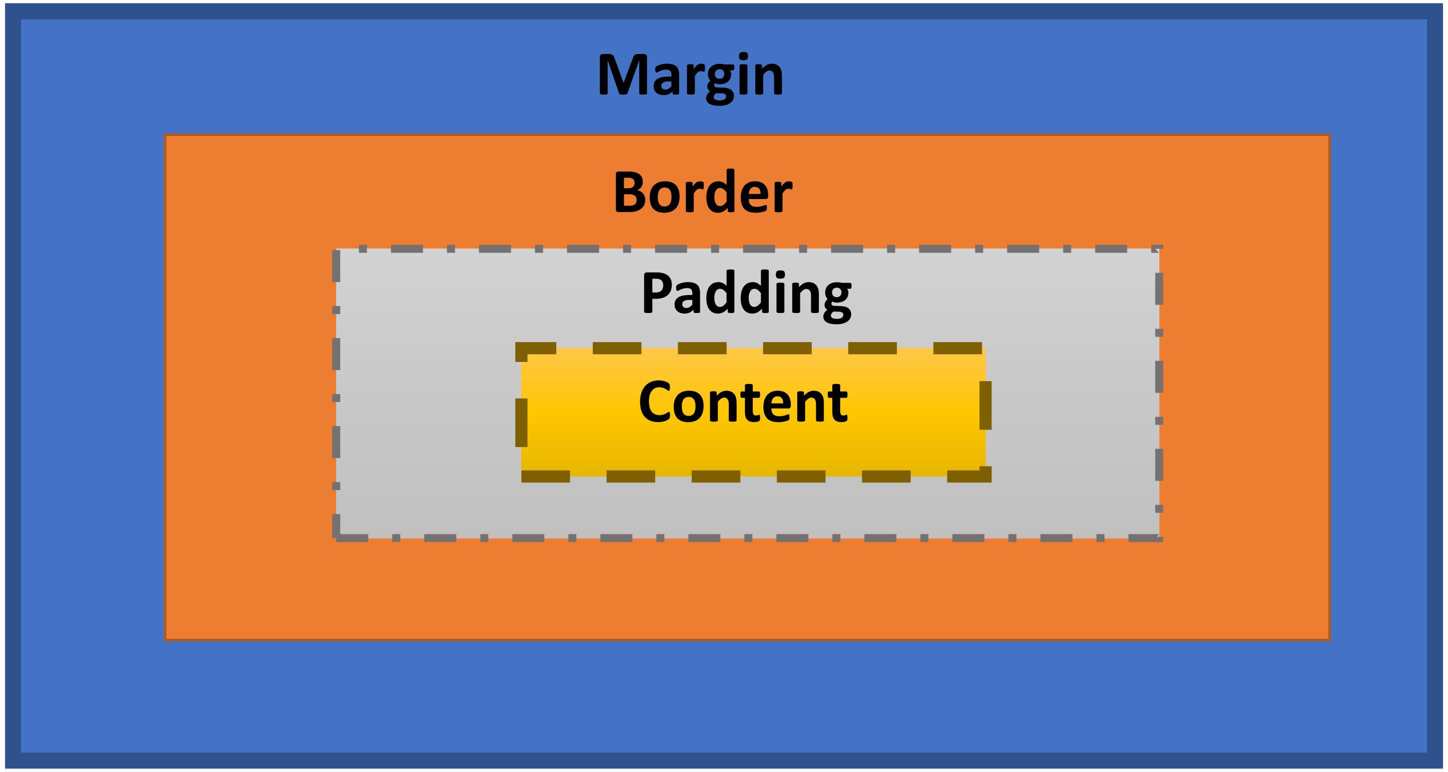
- Inline-block element is similar to inline elements, except that it allows setting a width and height on the element.
- It can have block element as child.

Example: <img>



The CSS box model

- **Content** - The content of the box, where text and images appear
- **Padding** - Clears an area around the content. The padding is transparent
- **Border** - A border that goes around the padding and content
- **Margin** - Clears an area outside the border. The margin is transparent.



Border

- You can specify each border individually
  - border-top
  - border-bottom
  - border-left
  - border-right
- border-style
  - dotted
  - dashed
  - solid
  - double
  - …
- Border-width
  - px, pt, cm, em, etc
  - thin, medium, or thick
- Border-color

Padding

- You can specify the padding for each side of the element

  padding-top

  padding-bottom

  padding-left

  padding-right

- Shorthand padding

Three values : top, right, bottom

Two values: top, right

One value: same for all padding

Margin

- You can specify the margin for each side of the element

  margin-top

  margin-bottom

  margin-left

  margin-right

- Values:

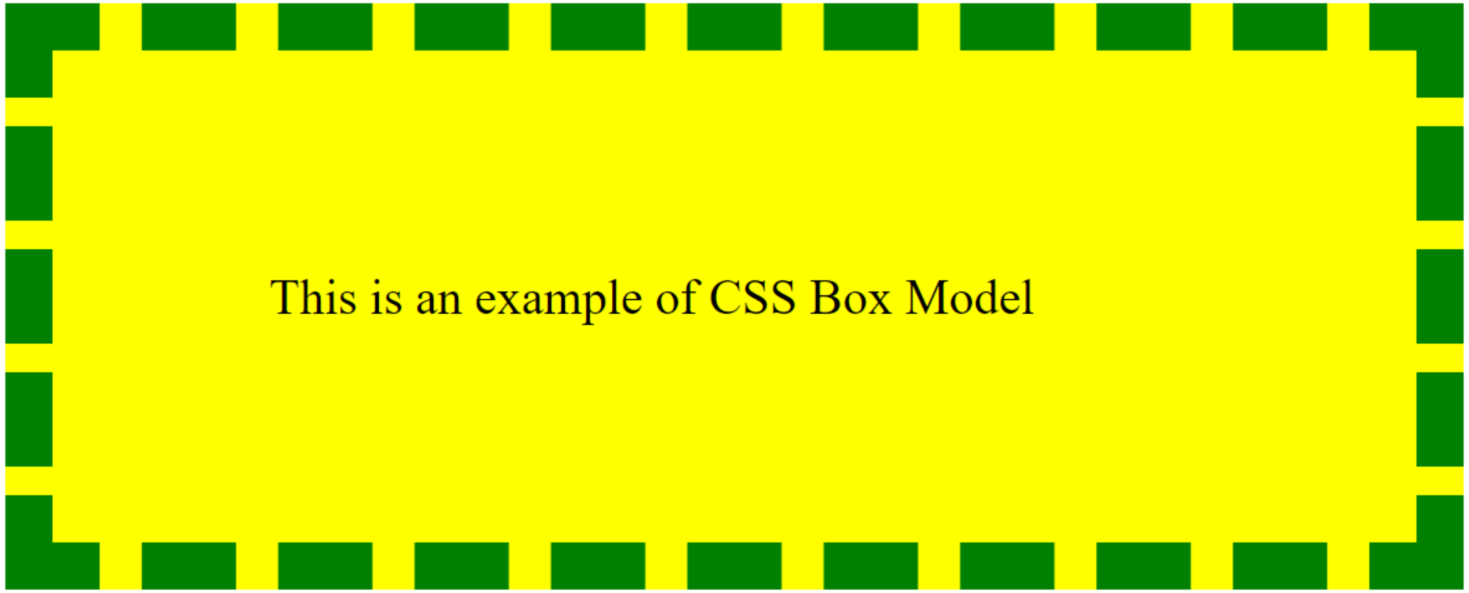
  auto - the browser calculates the margin

  length - specifies a margin in px, pt, cm, etc.

  % - specifies a margin in % of the width of the containing element

  inherit - specifies that the margin should be inherited from the parent element

```
div {
  background-color: yellow;
  width: 300px;
  border: 15px solid green;
  border-style: dashed;
  padding: 70px;
  margin: 20px;
}
```



This is an example of CSS Box Model

```
<div>This is an example of CSS Box Model</div>
```