

Lecture 12

Introduction to UI Implementation

UNIVERSITY OF AUCKLAND

COMPSCI 345 / SOFTENG 350

Dr. Gerald Weber

Zoom meeting 5/6 May

<https://auckland.zoom.us/j/98105195723?pwd=L0FMdINkY2NFNjdhTWlOT01jNm5rUT09>

Learning Objectives

To be able to

- Understand the foundations of Web technology.
- Understand the basic document tree structure of web technology
- Be able to utilize online resources.
- Appreciate and employ open resources

The Web client side technology core

- The web browser is a smart client which can nowadays execute very complex applications, with a mature and maintained security architecture.
- The compound of technologies needed to program one client application in the browser:
 - HTML (Hypertext Markup Language):
 - The content language
 - CSS (Cascading Style Sheets):
 - The formatting language
 - Javascript: The dynamic programming language.
- All three are closely intertwined through the
- Document Object Model (DOM) in Javascript.

The beginning of the Web

In the news

- **Tim Berners-Lee** (*pictured*) wins the Turing Award for inventing the World Wide Web, the first web browser, and the protocols and algorithms that allow the Web to scale.



The beginning of the Web

```
1 <!DOCTYPE html>
2 <html lang="en">
3 <head>
4   <meta charset="UTF-8">
5   <title>HTML BASICS</title>
6 </head>
7 <body>
8   <h1>HTML Basics</h1>
9   <h2>The beginnings</h2>
10
11 <p> HTML was a method to format hypertext.
12 <ol>
13   <li> The order of the text not really changed. </li>
14   <li> Just adding formatting and
15     <a href="https://en.wikipedia.org/wiki/Hyperlink">
16       hyperlinks
17     </a></li>
18 </ol>
19 <table width="300" border="1" cellpadding="5" >
20   <tr><th>But </th> <th>Note</th> <th>&nbsp;</th></tr>
21   <tr><td>Even with</td> <td>formatting</td>
22     <td>in place</td> </tr>
23   <tr>
24     <td>Still for all parts largely </td>
25     <td>The same order of text flow</td>
26     <td>except for multi column text.</td>
27   </tr>
28 </table>
29 <ul>
30   <li> From the start interest in logical markup </li>
31   <li> But logic and layout remain often mixed.</li>
32 </ul>
33 </body>
34 </html>
```

HTML Basics

The beginnings

HTML was a method to format hypertext.

1. The order of the text not really changed.
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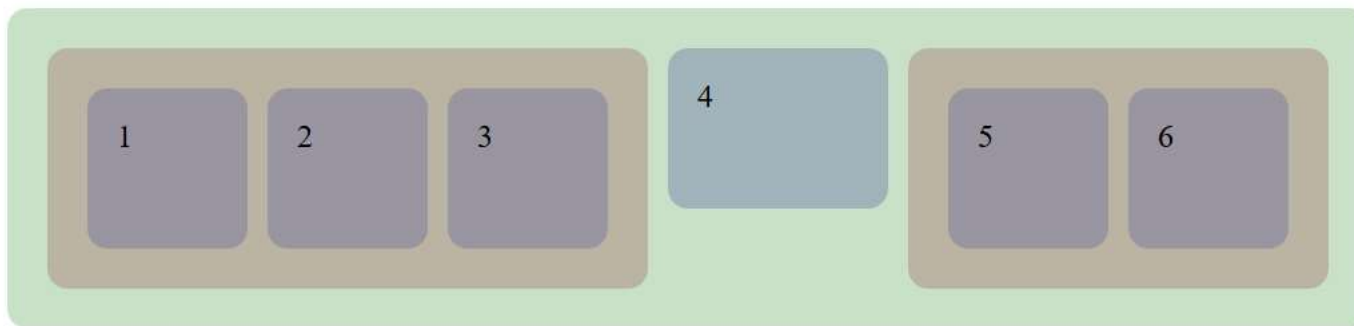
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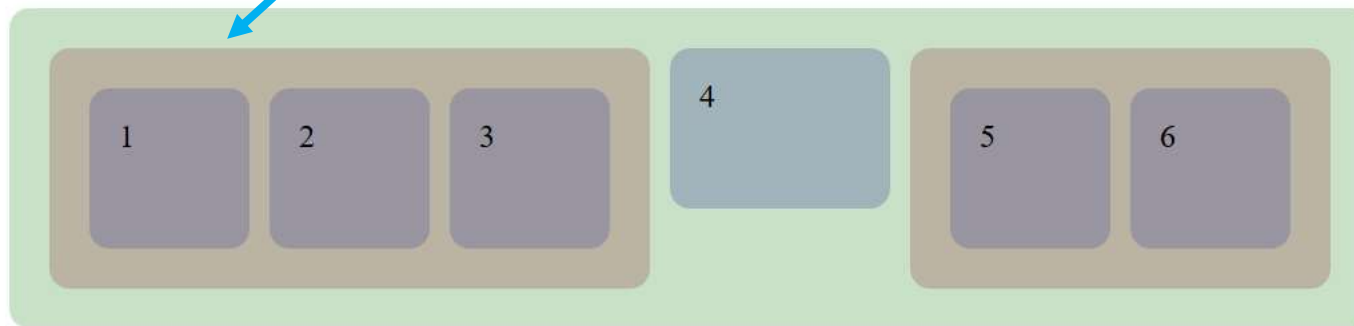
<div> as generic container

```
<body>
<div>
  <div>
    <div>1</div>
    <div>2</div>
    <div>3</div>
  </div>
  <div id="broad">4</div>
  <div>
    <div>5</div>
    <div>6</div>
  </div>
</div>
</body>
```



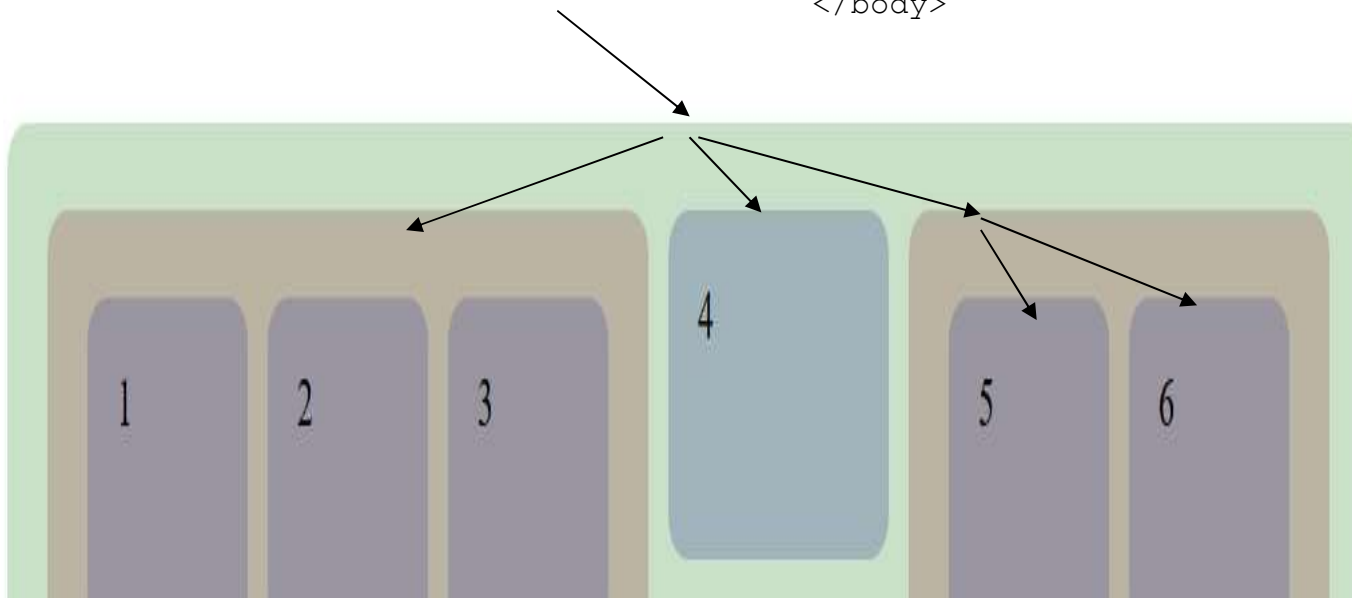
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      <div>5</div>
      <div>6</div>
    </div>
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```



The Dom Tree

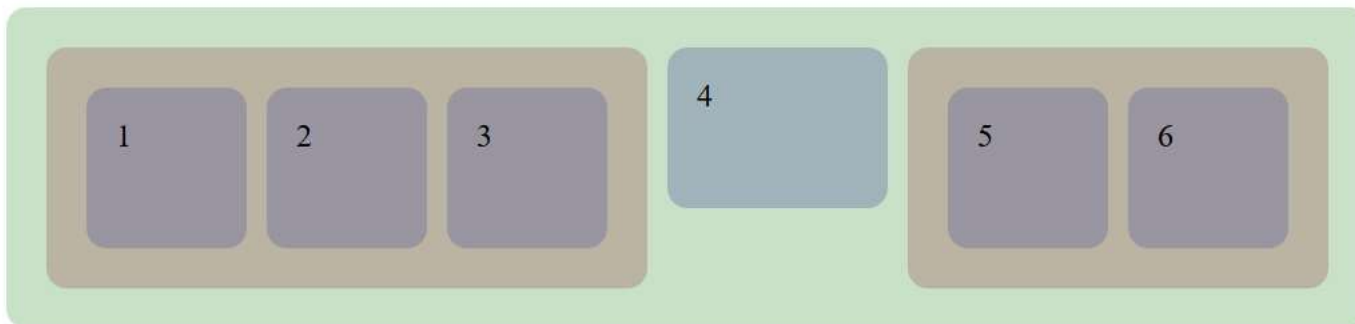
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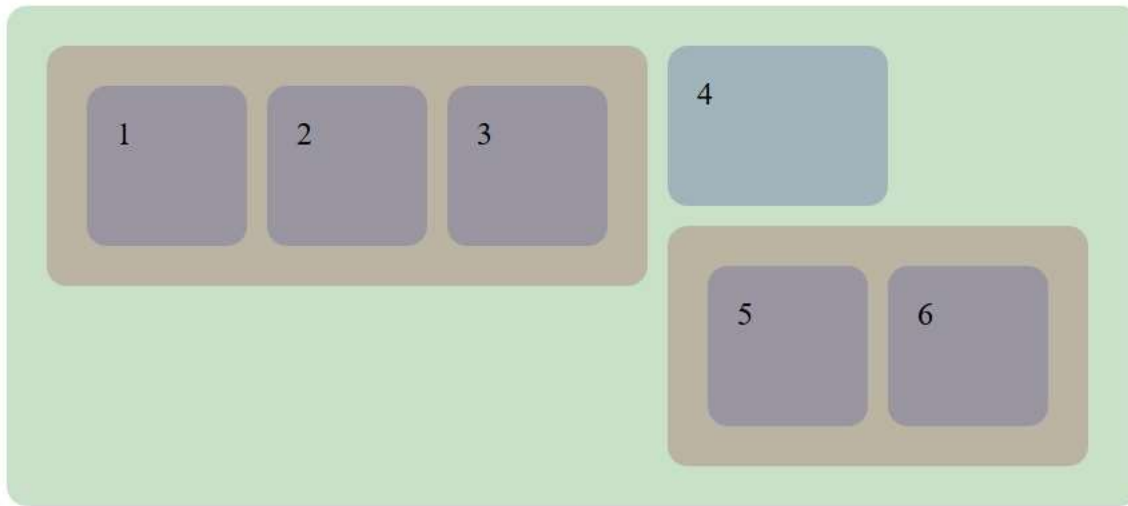
Web Resources

- [://developer.mozilla.org/en-US/docs/Learn](https://developer.mozilla.org/en-US/docs/Learn)
Learn Web Development
MDN web docs
- <https://www.w3schools.com/>
Web tutorials, demos, templates, reference, courses

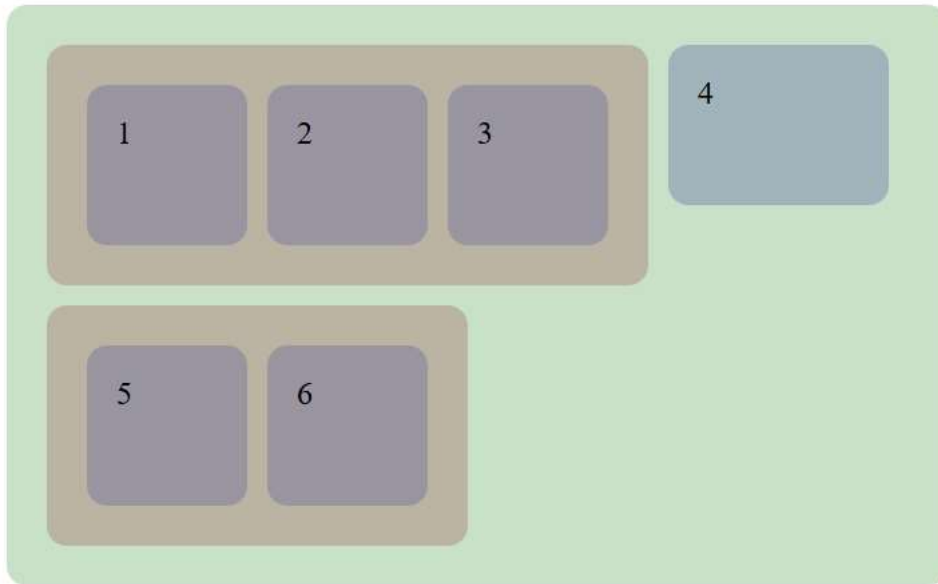
Float Layout



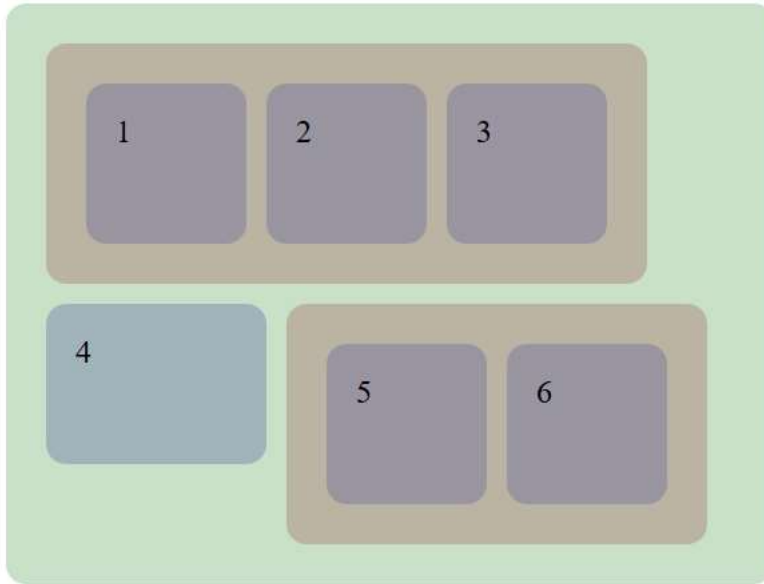
Float Layout



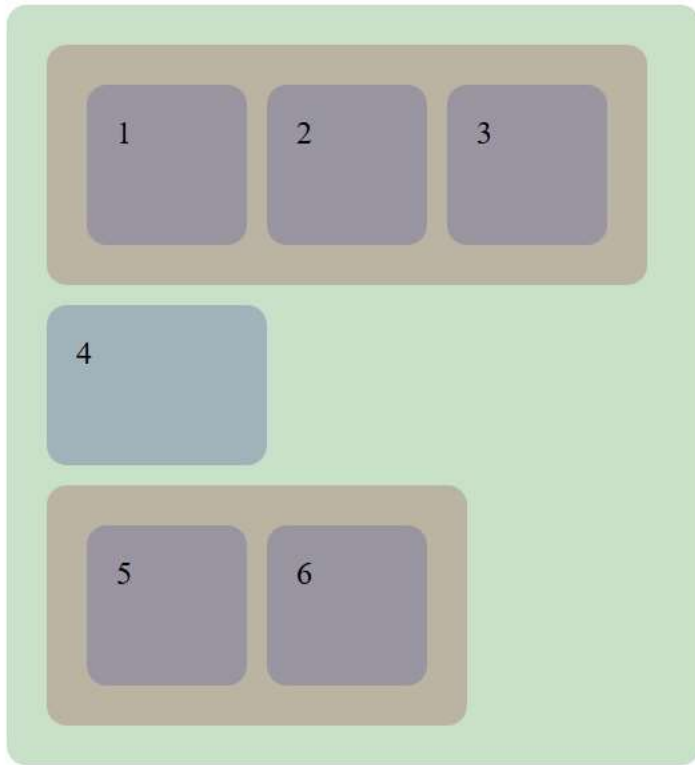
Float Layout



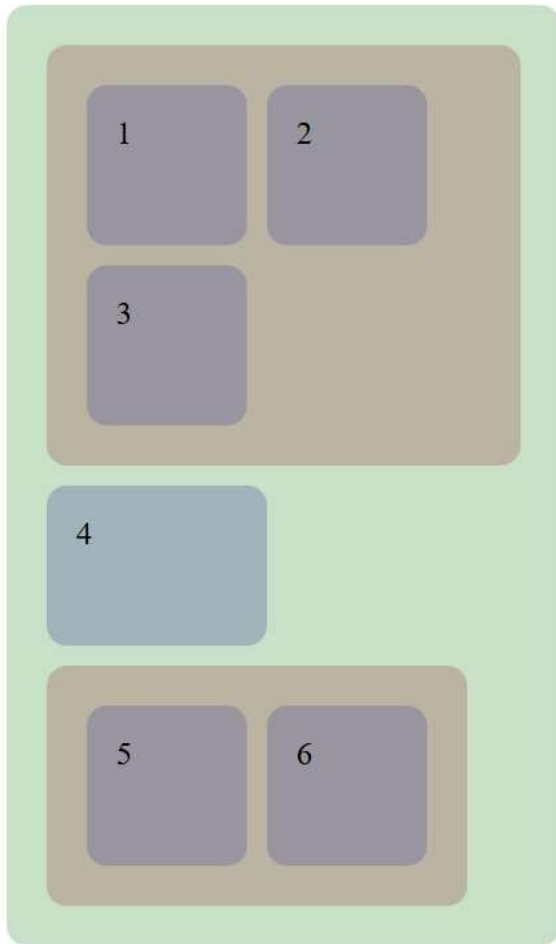
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Float Layout



Float Layout

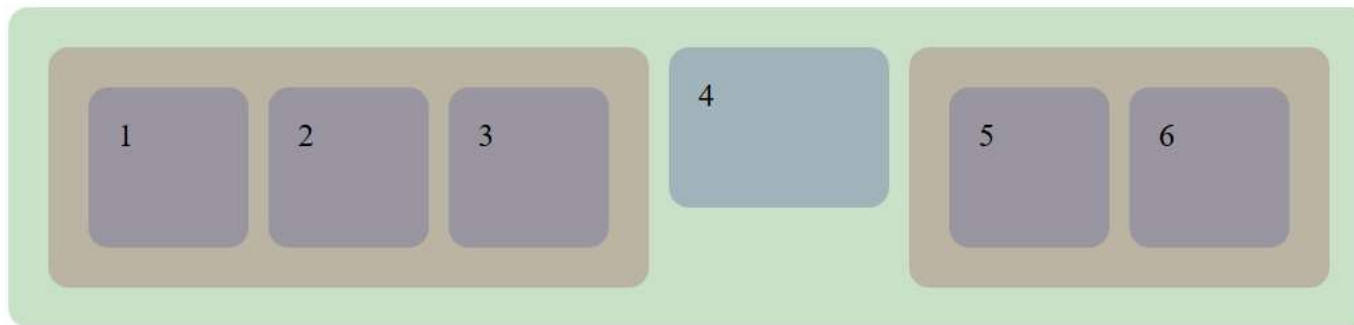


CSS Selectors

```
<head>
<style>
div {
  float:left;
  margin: 5px;
  padding: 15px;
  border-radius: 10px;
}
\\....
</style>
</head>
```

```
<style>
selector {
  property: value;
  property2: value2;
}
\\....
</style>
```

Abstract syntax

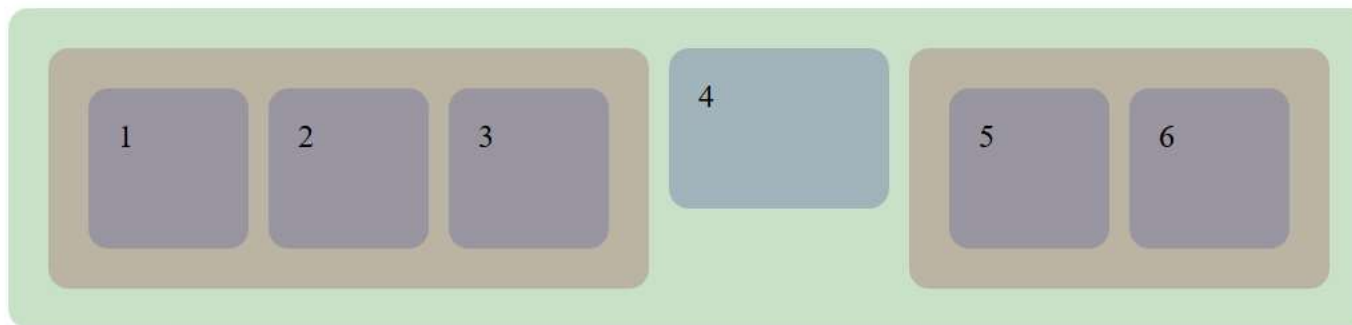


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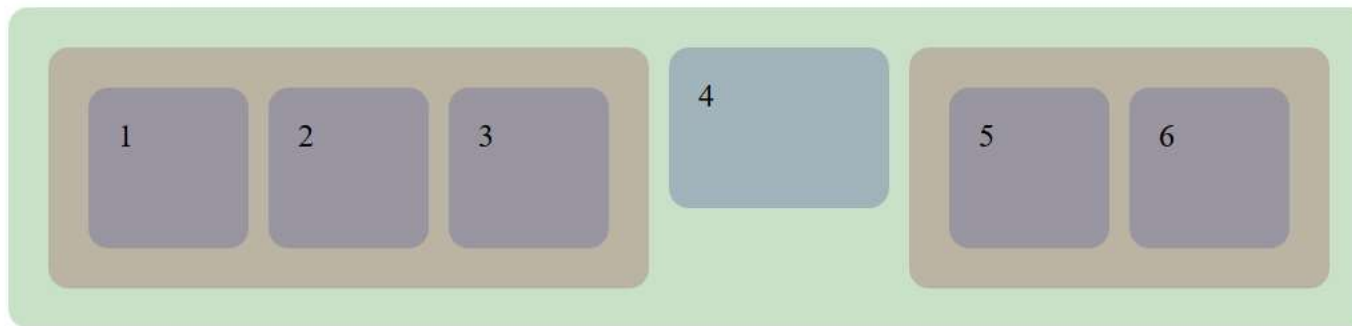


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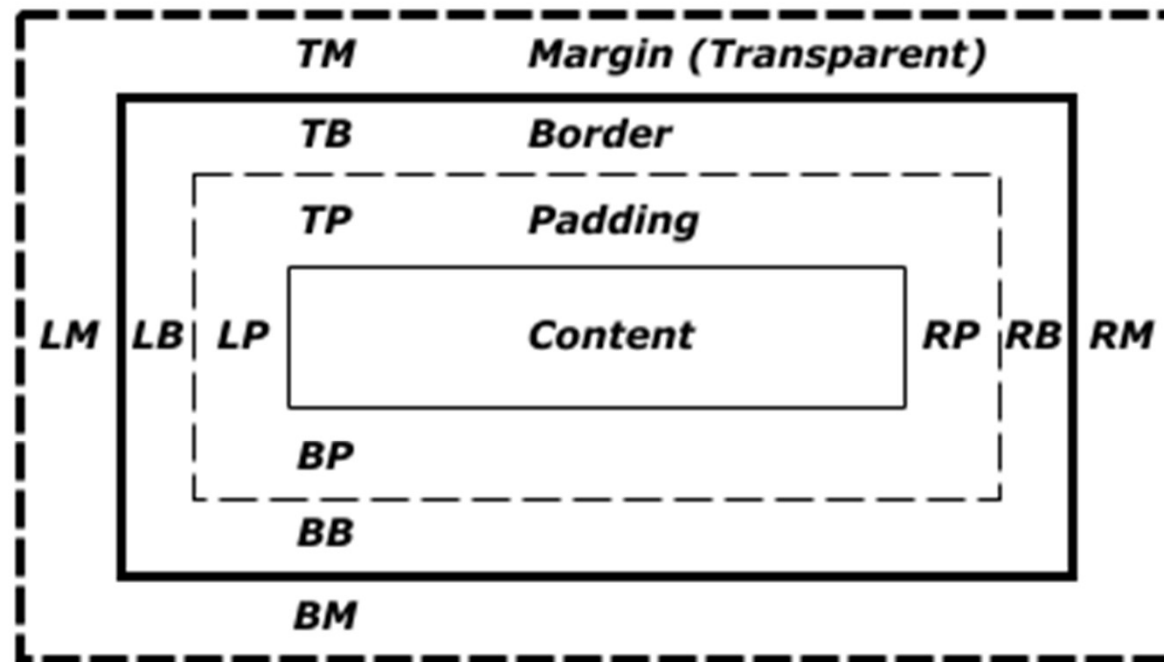
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</style>
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Abstract syntax



The Box model of an HTML element

<https://www.w3.org/TR/CSS22/>



Discussion:
Rachel Andrews:
www.smashingmagazine.com/2019/07/margins-in-css/

--- Margin edge
— Border edge
--- Padding edge
— Content edge

Border Demo:
www.w3schools.com/cssref/playit.asp?filename=playcss_border-style&preval=none

Colours in CSS

```
<style>
#transpOuter {
  background: #ff000050;
  \\\....
}
#transpMid {
  background: #00ff0050;
  \\\....
}
```

```
#transpHi {
  background: #0000ff50;
  \\\....
}
```

```
</style>
```

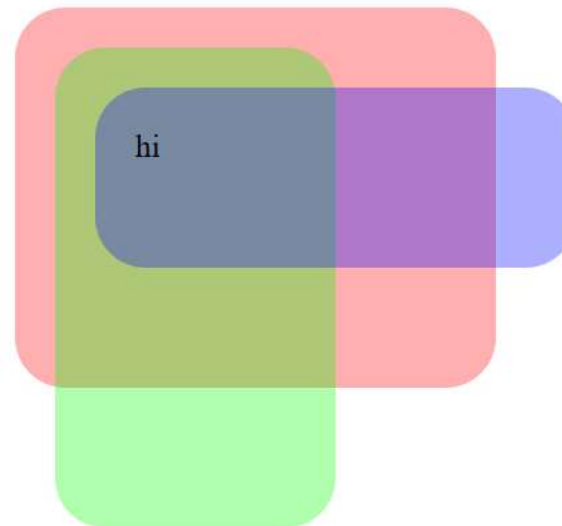
```
\\\....
```

```
<p>All colors 50% transparent</p>
```

```
<div id="transpOuter"><div id="transpMid"><div id="transpHi"> hi
</div></div></div>
```

Transparent Colors

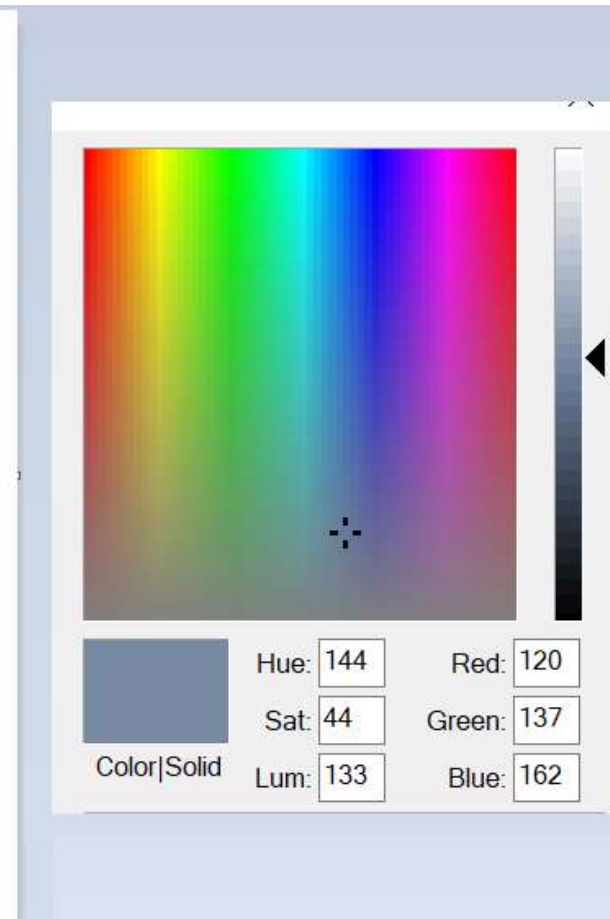
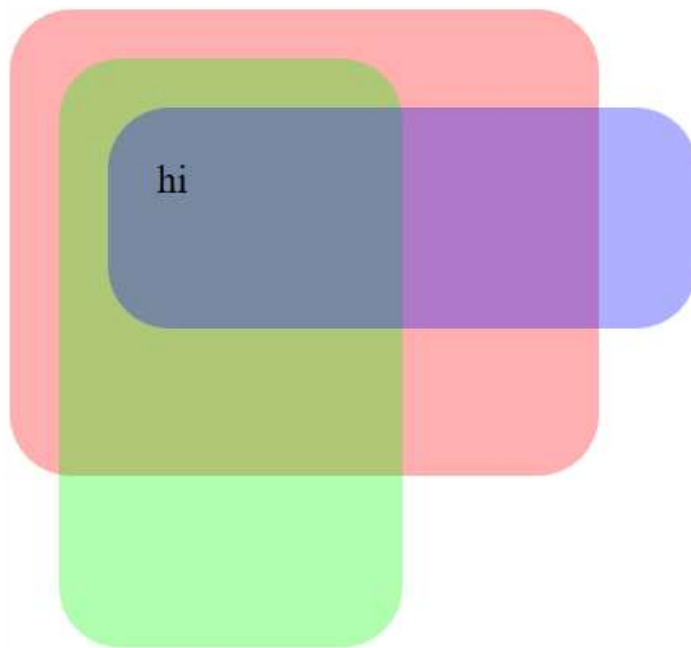
All colors 50% transparent



Colours in CSS

Transparent Colors

All colors 50% transparent



CSS Stylesheets

- Frequent and often recommended approach to use CSS.
- Stylesheets can include (link to) other stylesheets.
- Standard stylesheets can be referenced on high availability servers.

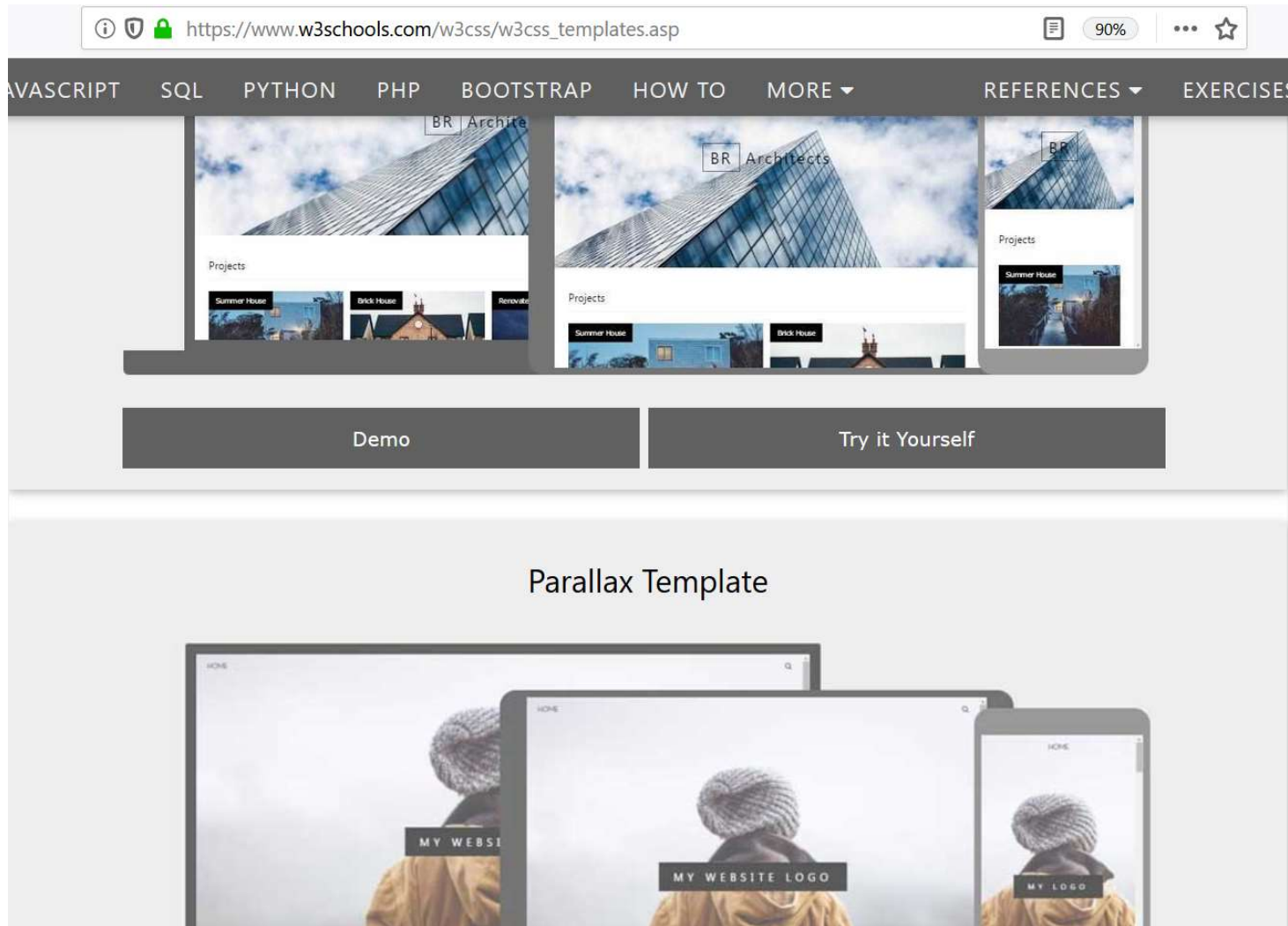
```
<!DOCTYPE html>
<html>
<head>
  <meta charset="UTF-8">
  <title>MyFile</title>
  <link rel="stylesheet"
href="/my/app.css">
</head>
<body>
//...
```

CSS Platform independence

- Default stylesheets of web browsers are online.
- Many similarities, but notable differences
- It might be good to use a reset stylesheet:
- https://en.wikipedia.org/wiki/Reset_style_sheet

```
* {  
    padding: 0;  
    margin: 0;  
}
```
- Many stylesheets already contain resets.

W3.CSS Templates



Lecture notes

- The technologies HTML and CSS begin with the static appearance of Web interfaces as well as offering simple responsiveness to form factor changes such as flow layout.
- The elements in an HTML document form a tree, the document object model tree.
- Style sheets can target different elements via selectors and provide properties which apply to all selected elements.
- Web frameworks e.g. as CSS sheets can give platform independence of the presentation.