Web Development

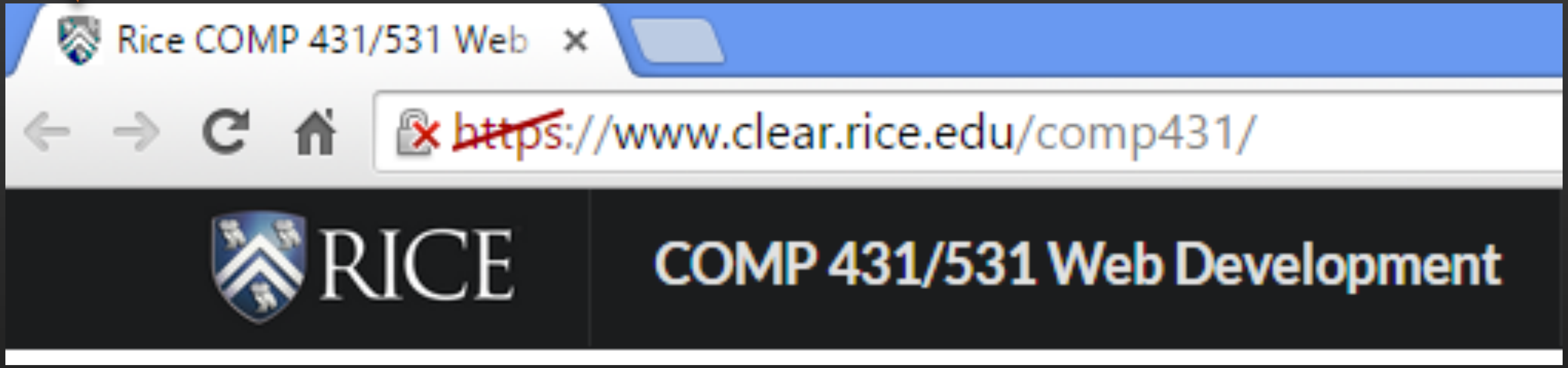
COMP 431 / COMP 531

Cascading Style Sheets

Scott E Pollack, PhD

Reference Slides

Favicon



Rice COMP 431/531 Web ×

~~htt~~ps://www.clear.rice.edu/comp431/

RICE

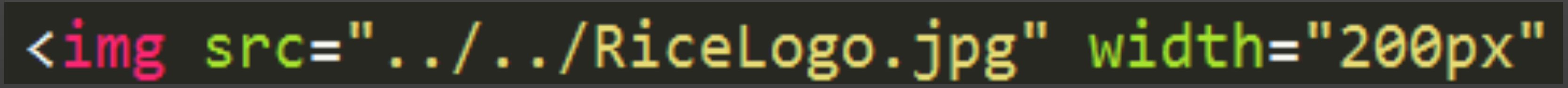
COMP 431/531 Web Development

```
<link rel="icon" href="/favicon.ico" type="image/x-icon">
```

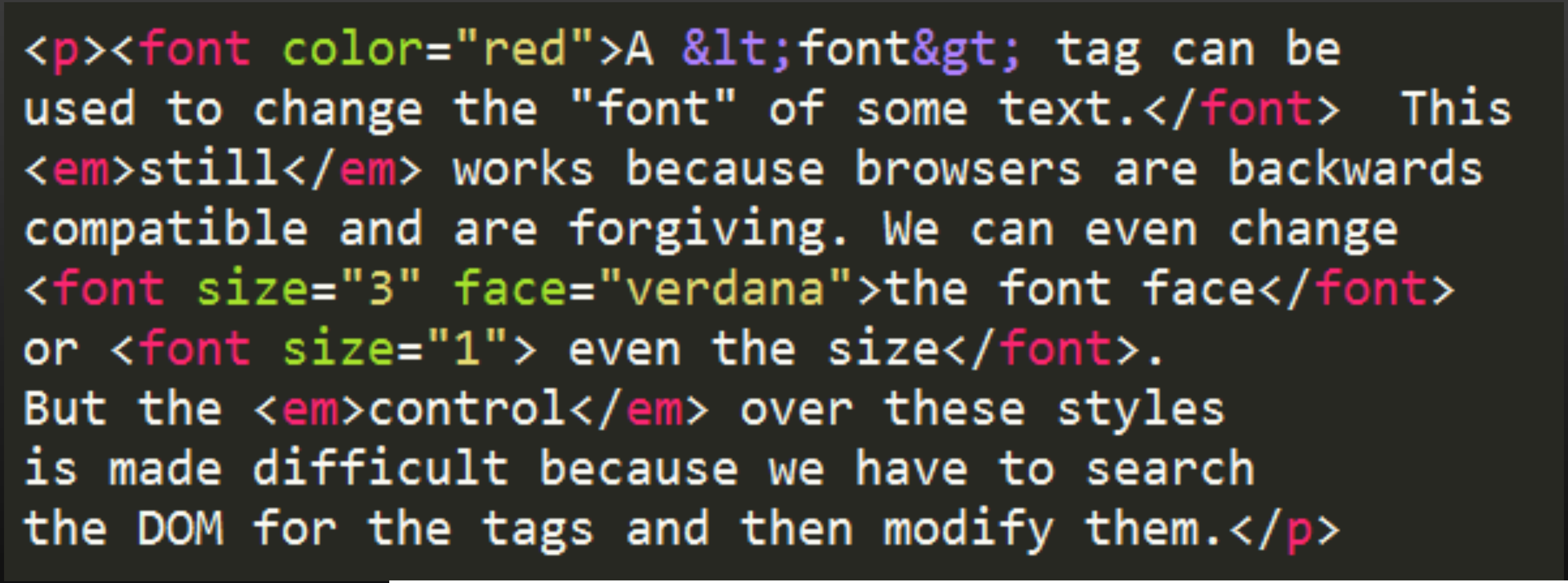
Styling HTML

- We already have **<strong>** and *<em>*
- What about changing the text color?
- Background color?
- Style of a table? E.g., border and spacing

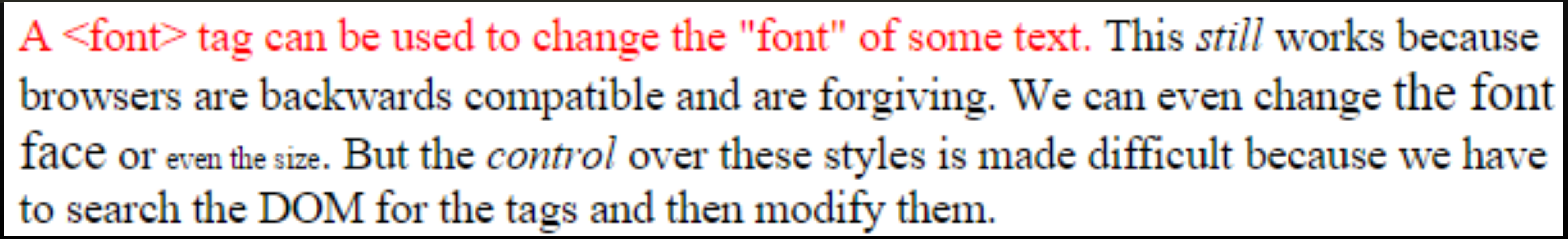
Styling HTML



```
<img src="../../RiceLogo.jpg" width="200px"
```



```
<p><font color="red">A &lt;font&gt; tag can be
used to change the "font" of some text.</font>  This
<em>still</em> works because browsers are backwards
compatible and are forgiving. We can even change
<font size="3" face="verdana">the font face</font>
or <font size="1"> even the size</font>.
But the <em>control</em> over these styles
is made difficult because we have to search
the DOM for the tags and then modify them.</p>
```



A <font> tag can be used to change the "font" of some text. This *still* works because browsers are backwards compatible and are forgiving. We can even change the font face or even the size. But the *control* over these styles is made difficult because we have to search the DOM for the tags and then modify them.

Drive for Style

- We're constructing a web application
- Separation of content from presentation
- We want consistency between pages
- Our own "look" and "feel"
- Color scheme
- Font Selection
- Background images or watermarks
- Ease of change
- Accessibility

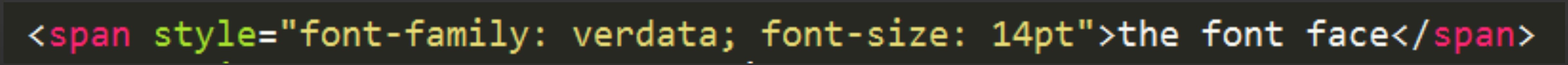
Dynamic!

Cascading Style Sheets

- Separation of style (presentation) and content
  - For example, switching between desktop and mobile
- Parallel development with content stubs
  - Styling and Control (i.e., JavaScript) can then be developed in parallel
- Reuse of style sheets
  - Style once present everywhere
- “Cascading” meaning one follows another.
  - There’s an order of importance in style annotations
- Users can selectively turn styles off or turn others on.

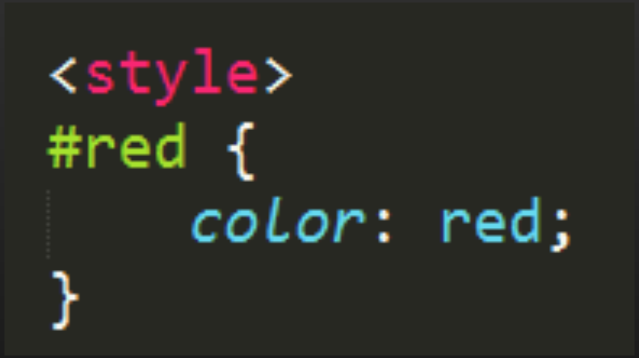
Where does CSS go?

- Style can be inline



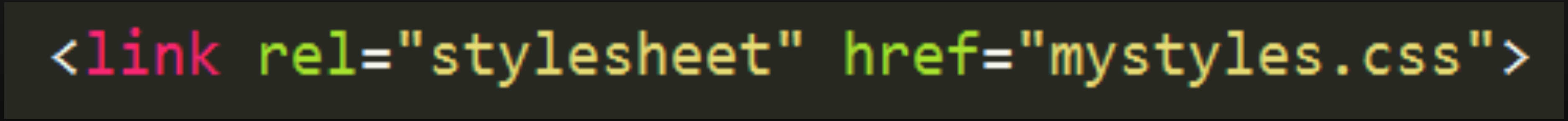
```
<span style="font-family: verdata; font-size: 14pt">the font face</span>
```

- Style can be defined internally



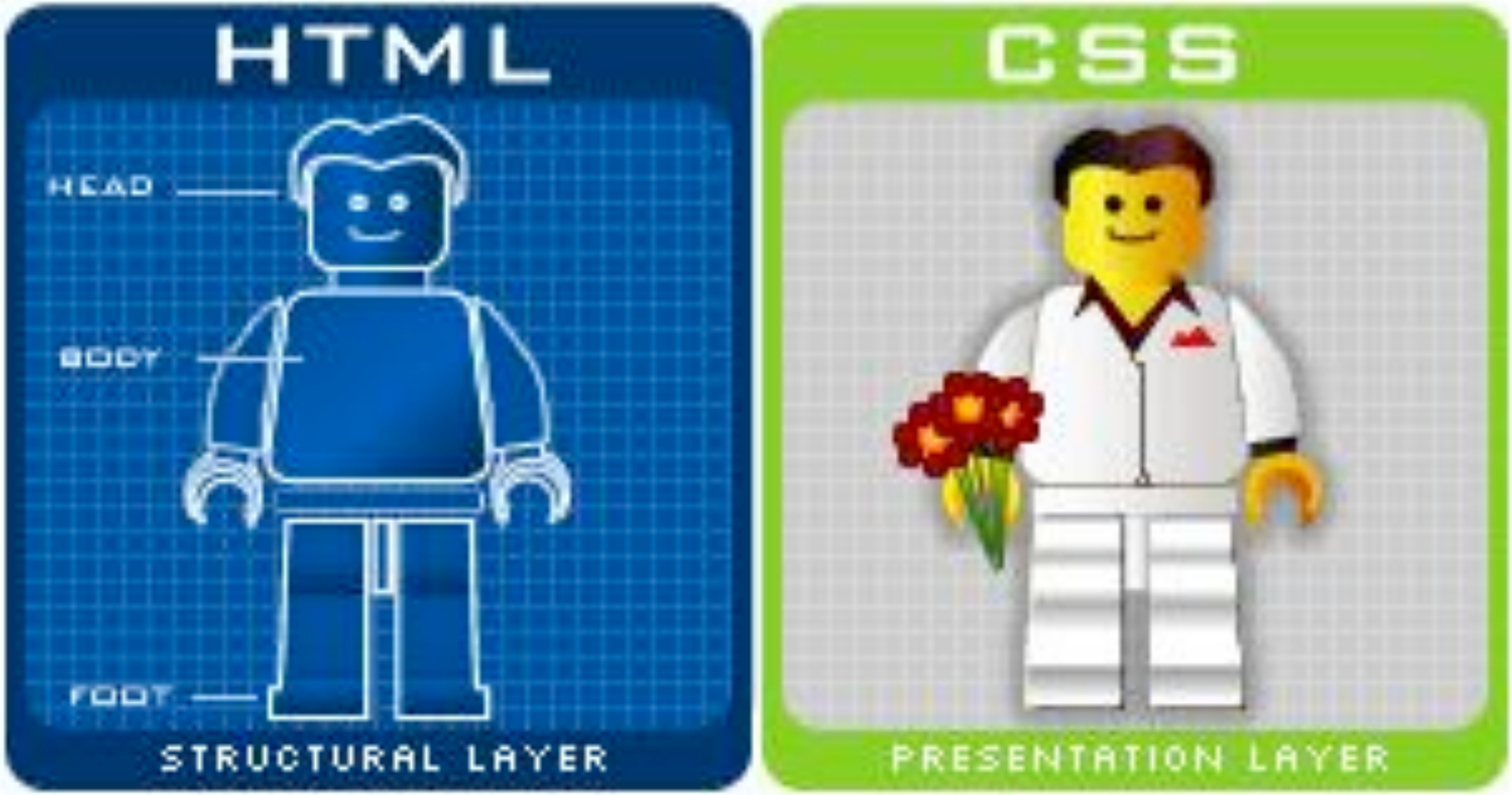
```
<style>
#red {
    color: red;
}
```

- Style can be defined externally



```
<link rel="stylesheet" href="mystyles.css">
```

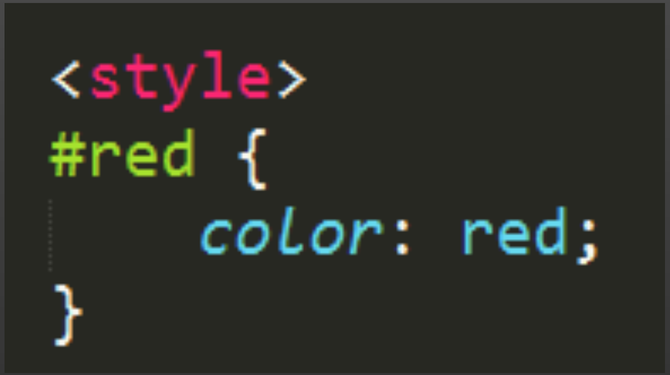
We can use all of the above simultaneously. *But the last is best.*



HTML is the blueprint and CSS is the coloring on top.

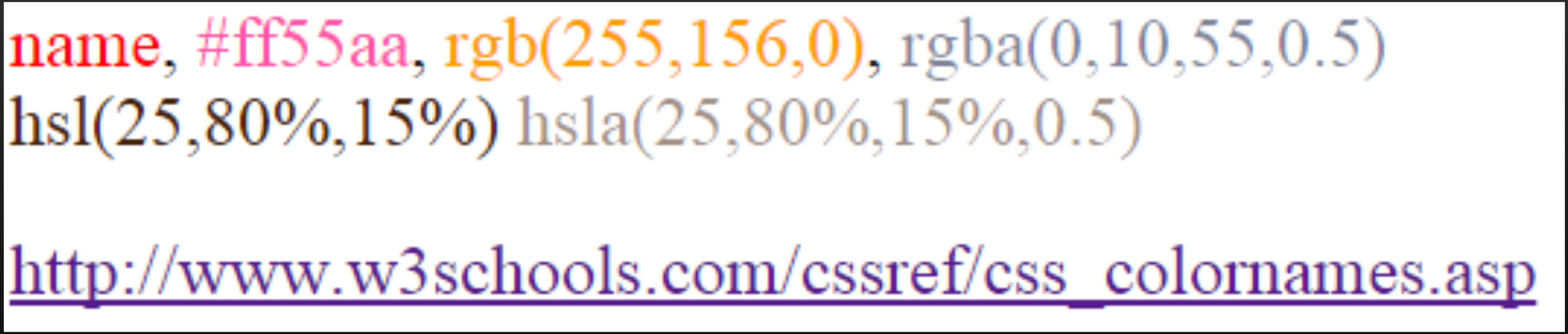
http://slides.com/brianlam/html5-and-css3--2/

Colors



```
<style>
#red {
    color: red;
}
```

- Change foreground (i.e., text) or background color
- Specify by



name, #ff55aa, rgb(255,156,0), rgba(0,10,55,0.5)
hsl(25,80%,15%) hsla(25,80%,15%,0.5)

http://www.w3schools.com/cssref/css_colornames.asp

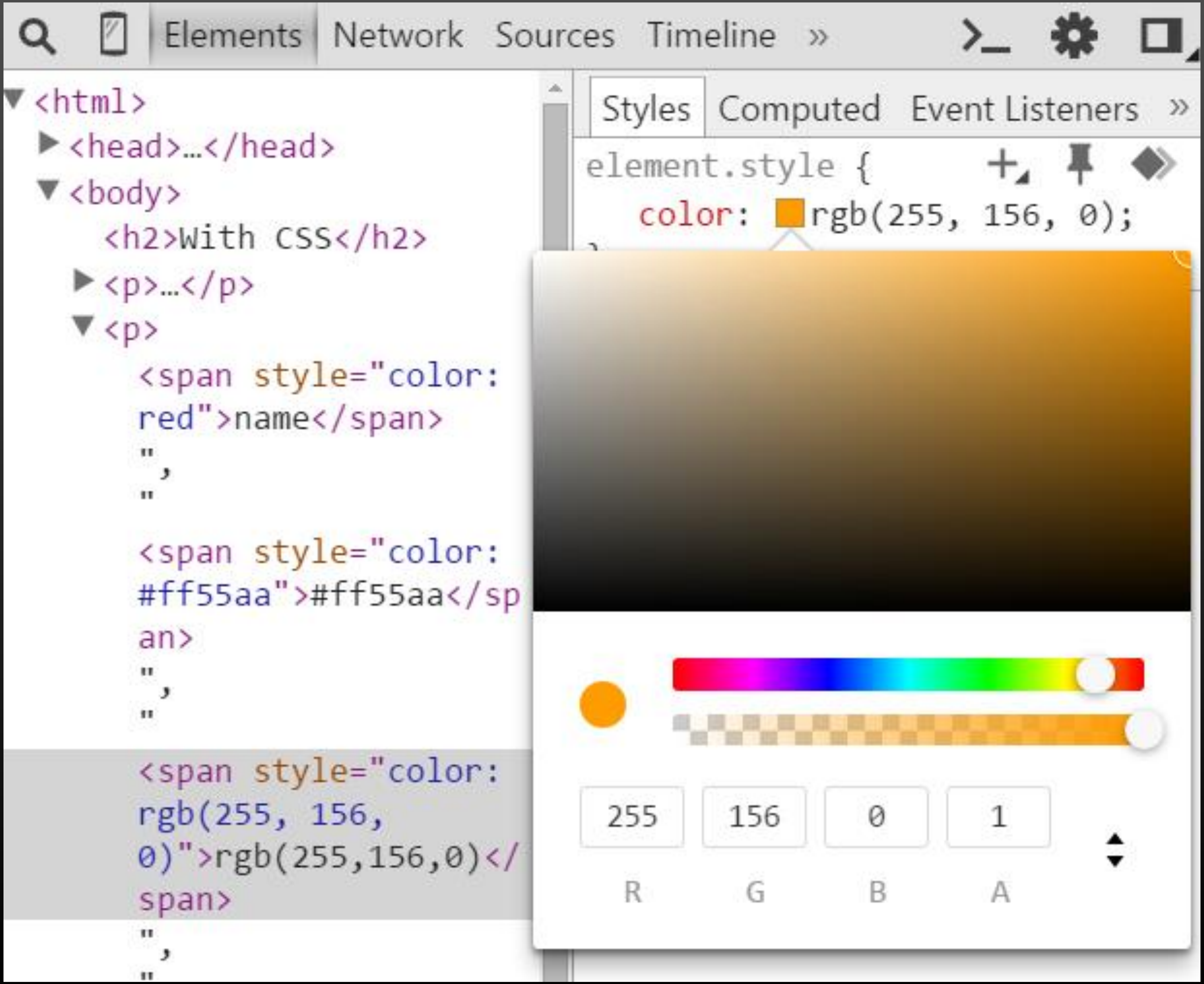
http://www.w3schools.com/tags/ref_colorpicker.asp

Dev Tools

Live Editing

ctrl+shift+C
cmd+option+I
select an element to inspect

Update CSS styles in real time
Is much faster than edit and
refresh



```
▼ <html>
  ▶ <head>…</head>
  ▼ <body>
      <h2>With CSS</h2>
    ▶ <p>…</p>
    ▼ <p>
        <span style="color:
        red">name</span>
        ",
        "
        <span style="color:
        #ff55aa">#ff55aa</sp
        an>
        ",
        "
        <span style="color:
        rgb(255, 156,
        0)">rgb(255,156,0)</
        span>
        ",
        "
```

```
element.style {
   color: rgb(255, 156, 0);
```

R	G	B	A
255	156	0	1

Font “Face”

- *font-family*
  - Comma separated list
  - Browser picks the font depending on system availability

- Google Fonts
  - Visual selection of various fonts.
  - Create a special “collection” of fonts for your site

```
<link href='https://fonts.googleapis.com/css?family=Roboto'
        rel='stylesheet' type='text/css'>
```

```
font-family: 'Roboto', sans-serif;
```

Don’t go crazy with fonts, but it is good to have some variation to make your site look unique.

Decoration and Spacing

font-weight

bold

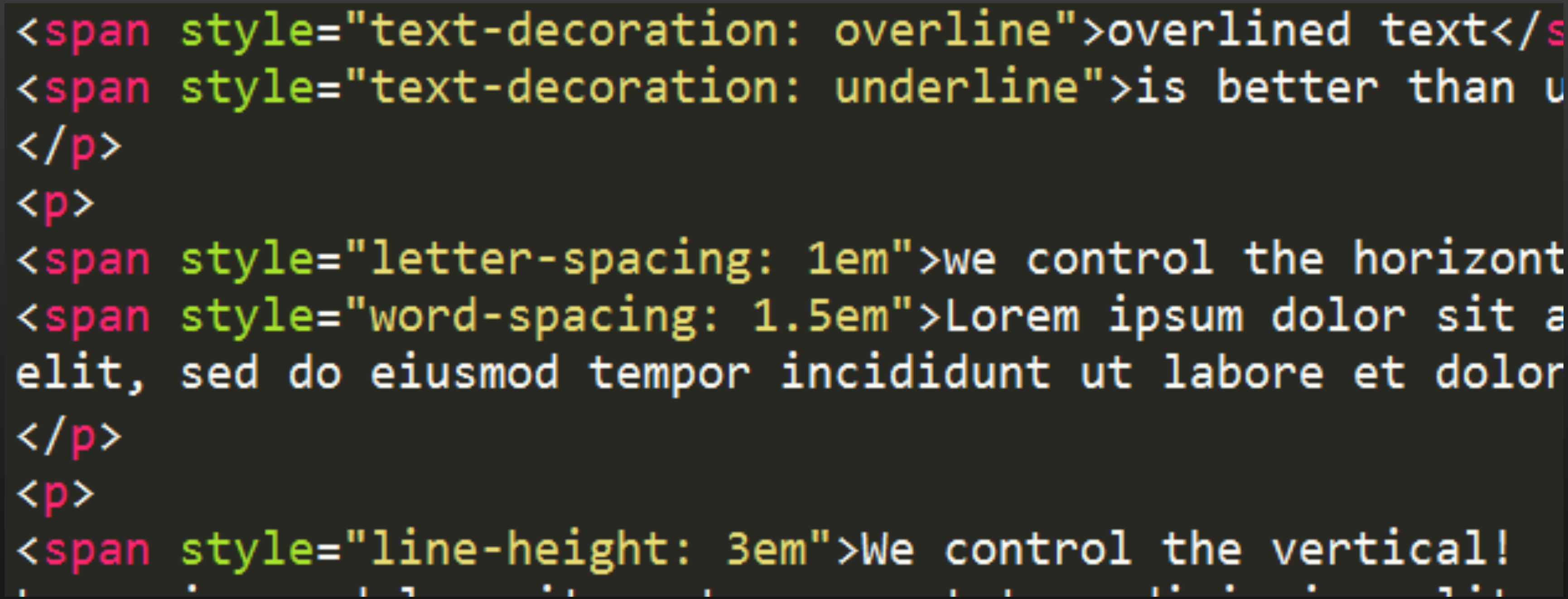
font-style

italic

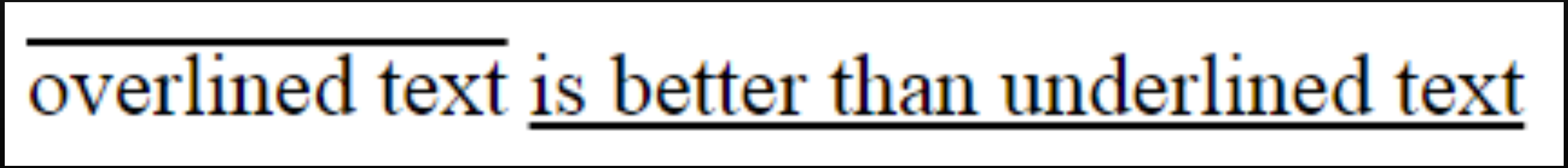
text-decoration

~~strike-through~~

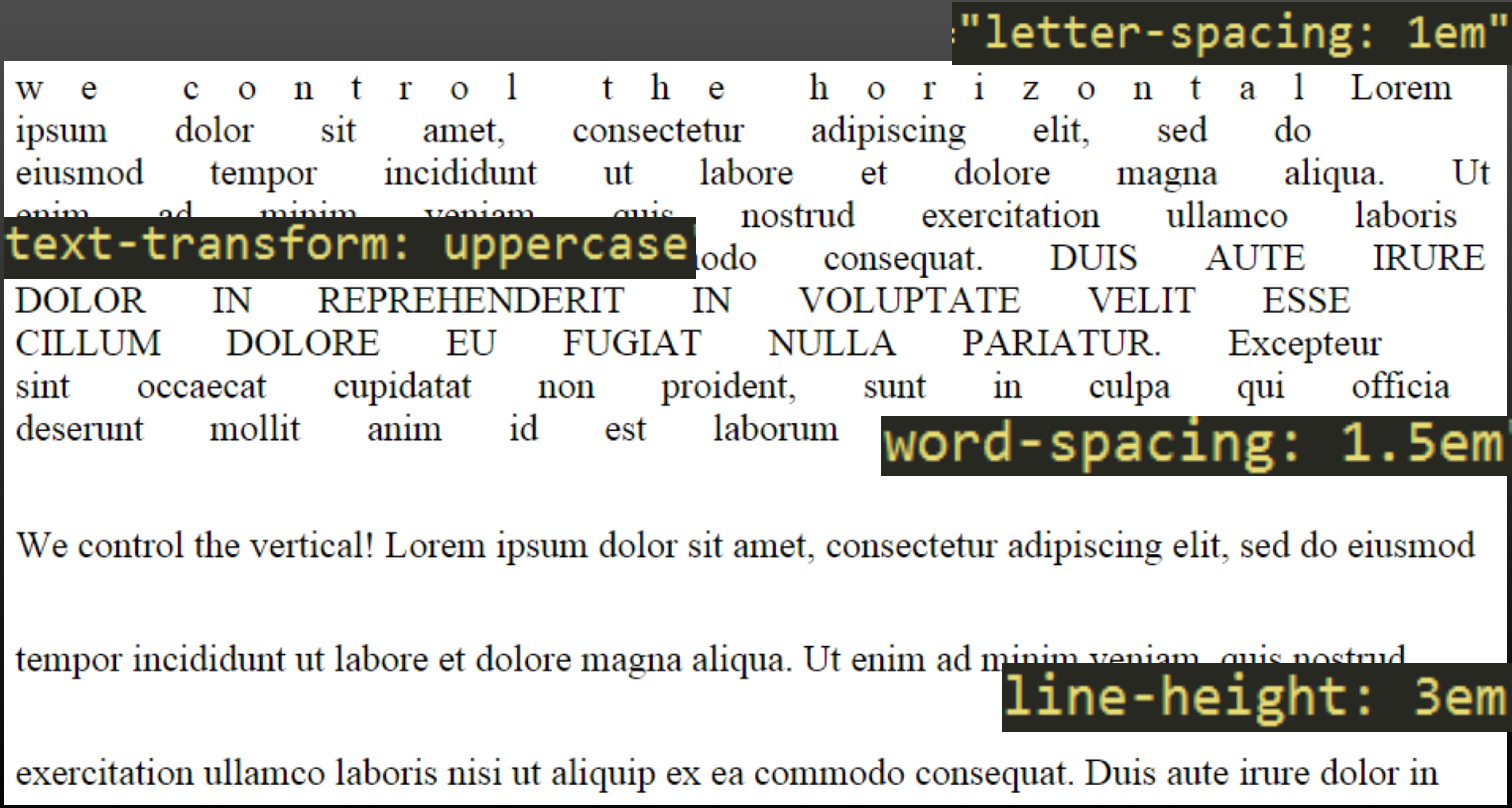
<u>underline</u>



```
<span style="text-decoration: overline">overlined text</s
<span style="text-decoration: underline">is better than u
</p>
<p>
<span style="letter-spacing: 1em">we control the horizont
<span style="word-spacing: 1.5em">Lorem ipsum dolor sit a
elit, sed do eiusmod tempor incididunt ut labore et dolor
</p>
<p>
<span style="line-height: 3em">We control the vertical!
```



overlined text is better than underlined text



:"letter-spacing: 1em"

we control the horizontal Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod tempor incididunt ut labore et dolore magna aliqua. Ut enim ad minim veniam, quis nostrud exercitation ullamco laboris

text-transform: uppercase'

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word-spacing: 1.5em'

We control the vertical! Lorem ipsum dolor sit amet, consectetur adipiscing elit, sed do eiusmod

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line-height: 3em'

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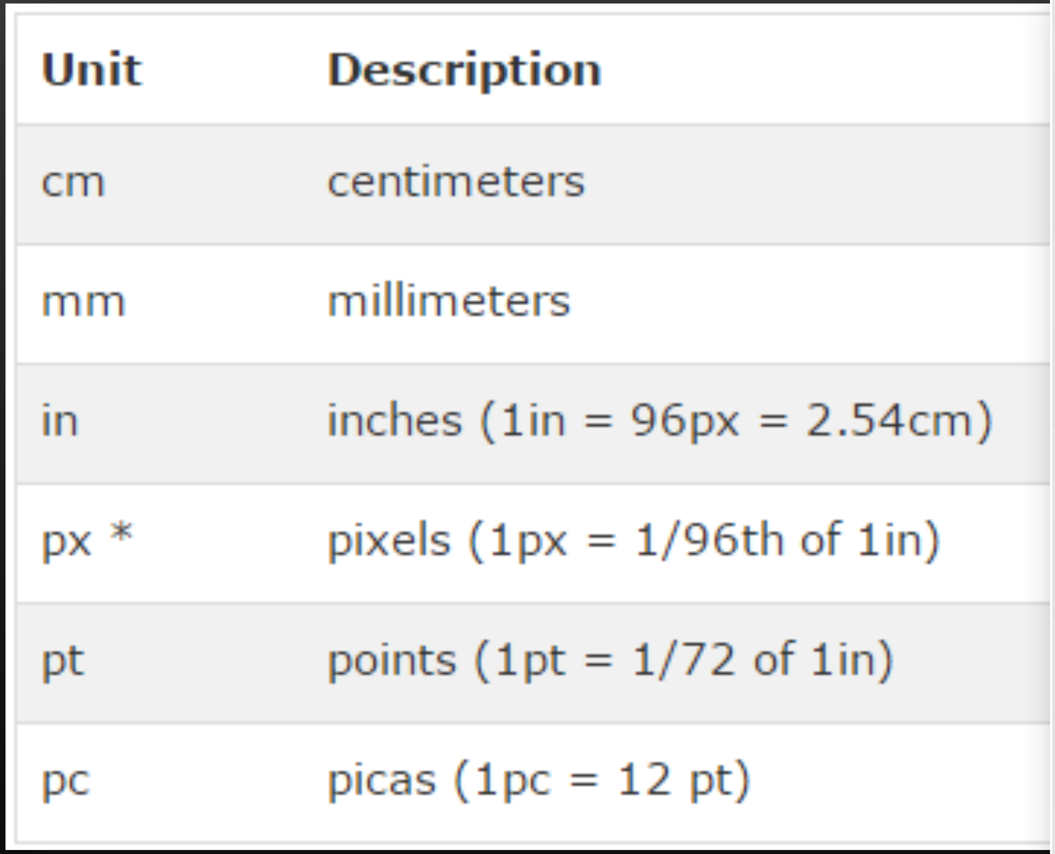
Size units

font-size: 10<?>
width: 500<?>

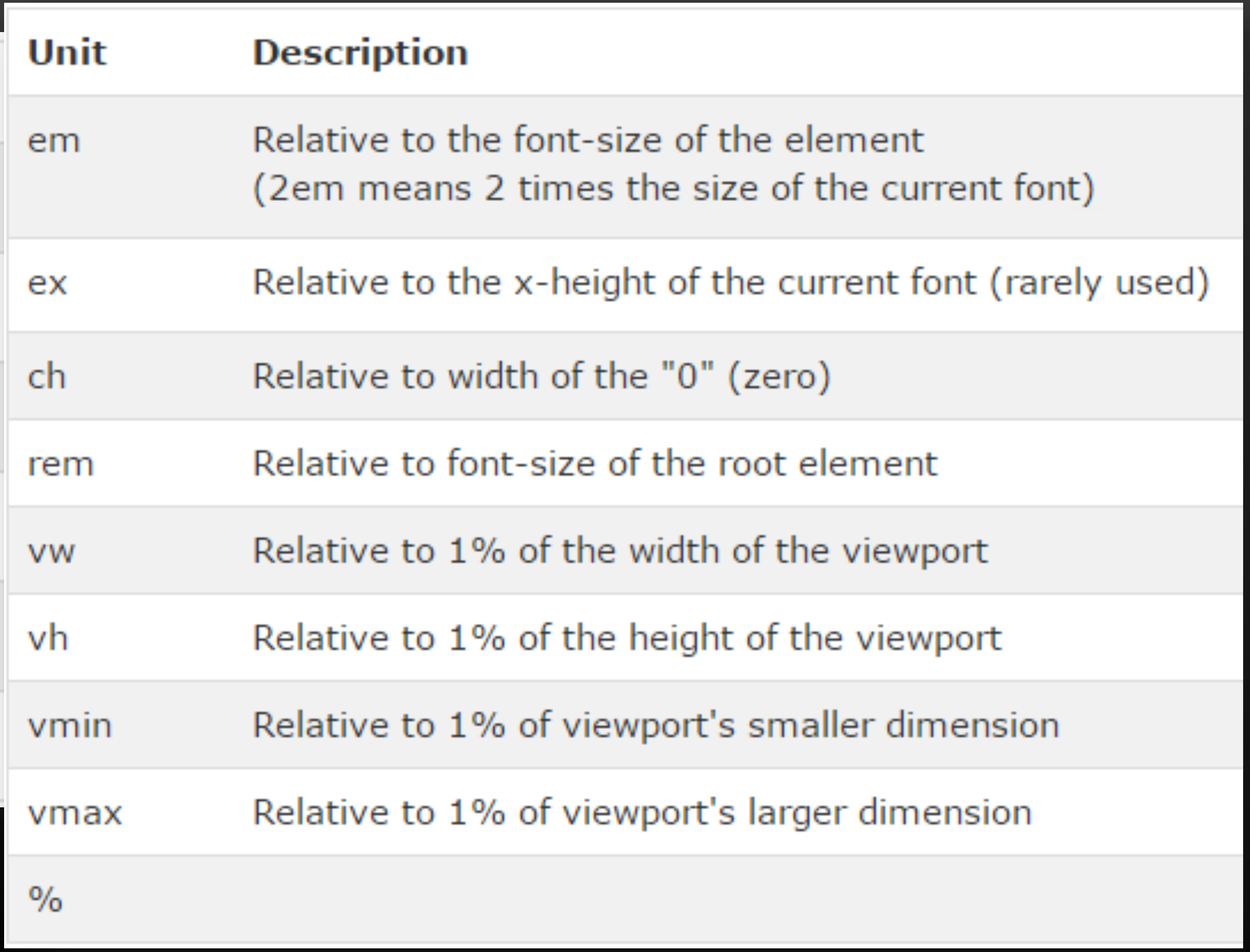
Absolute



Unit	Description
cm	centimeters
mm	millimeters
in	inches (1in = 96px = 2.54cm)
px *	pixels (1px = 1/96th of 1in)
pt	points (1pt = 1/72 of 1in)
pc	picas (1pc = 12 pt)

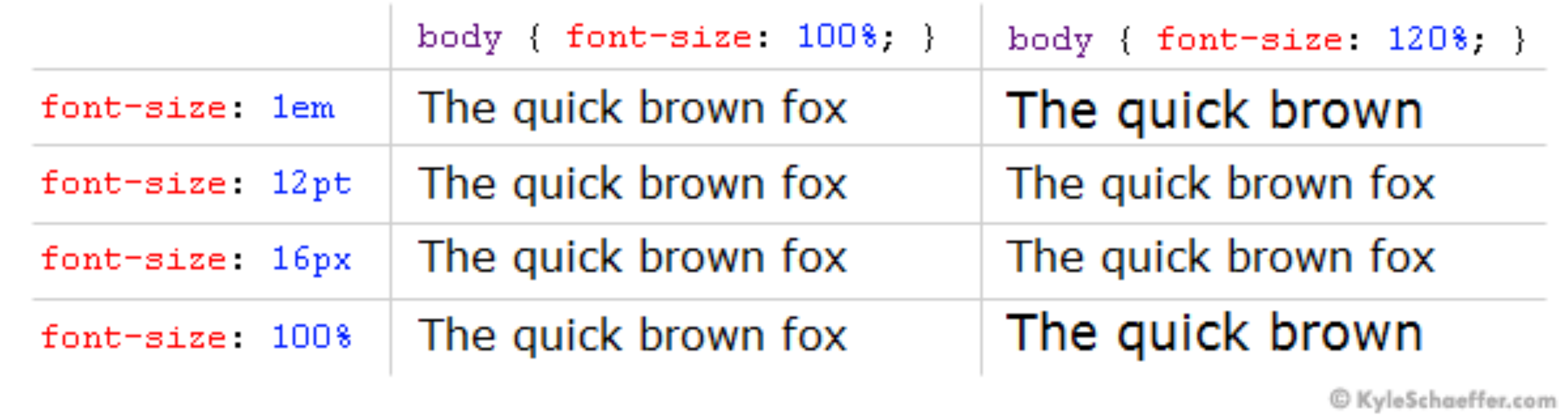
* px are viewing device relative.

Relative



Unit	Description
em	Relative to the font-size of the element (2em means 2 times the size of the current font)
ex	Relative to the x-height of the current font (rarely used)
ch	Relative to width of the "0" (zero)
rem	Relative to font-size of the root element
vw	Relative to 1% of the width of the viewport
vh	Relative to 1% of the height of the viewport
vmin	Relative to 1% of viewport's smaller dimension
vmax	Relative to 1% of viewport's larger dimension
%	

Use "em" whenever possible

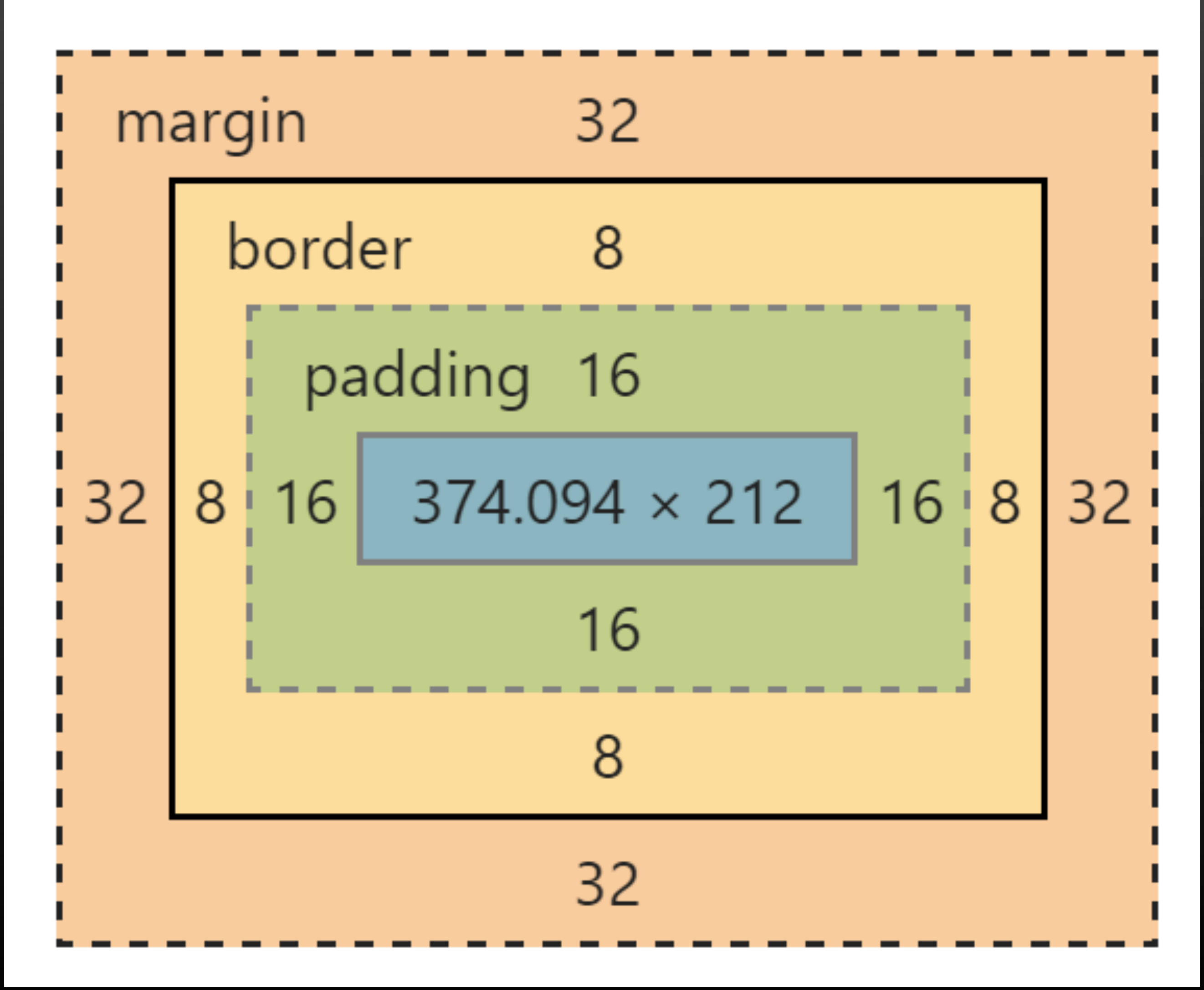


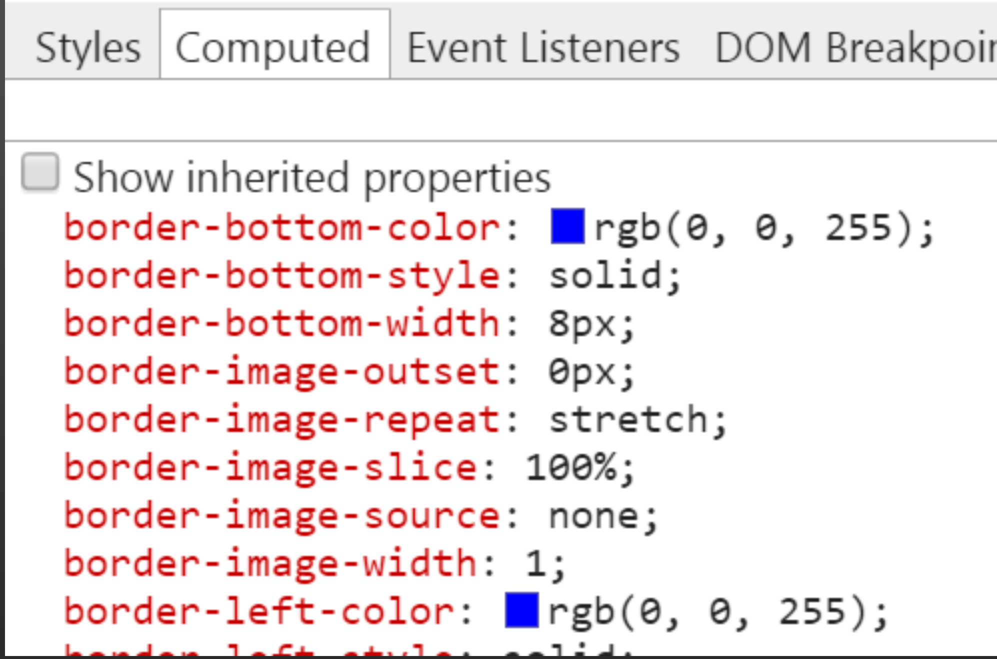
	body { font-size: 100%; }	body { font-size: 120%; }
font-size: 1em	The quick brown fox	The quick brown
font-size: 12pt	The quick brown fox	The quick brown fox
font-size: 16px	The quick brown fox	The quick brown fox
font-size: 100%	The quick brown fox	The quick brown

© KyleSchaeffer.com

Devtools can show you all of the styles for an element

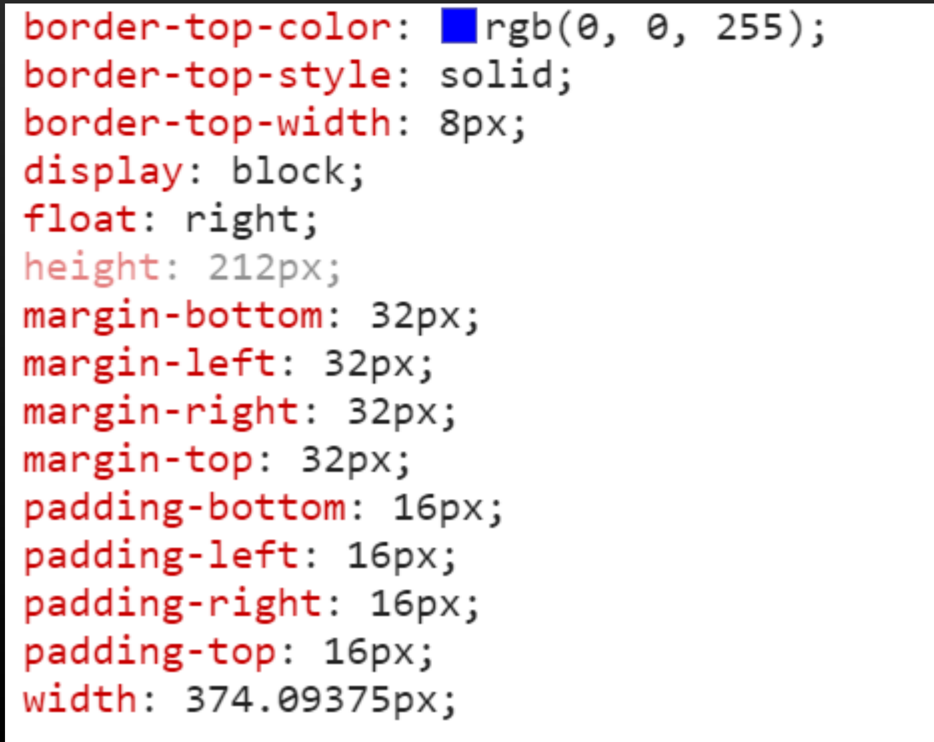
Box Model





□ Show inherited properties

```
border-bottom-color: 🟦rgb(0, 0, 255);
border-bottom-style: solid;
border-bottom-width: 8px;
border-image-outset: 0px;
border-image-repeat: stretch;
border-image-slice: 100%;
border-image-source: none;
border-image-width: 1;
border-left-color: 🟦rgb(0, 0, 255);
border-left-style: solid;
```



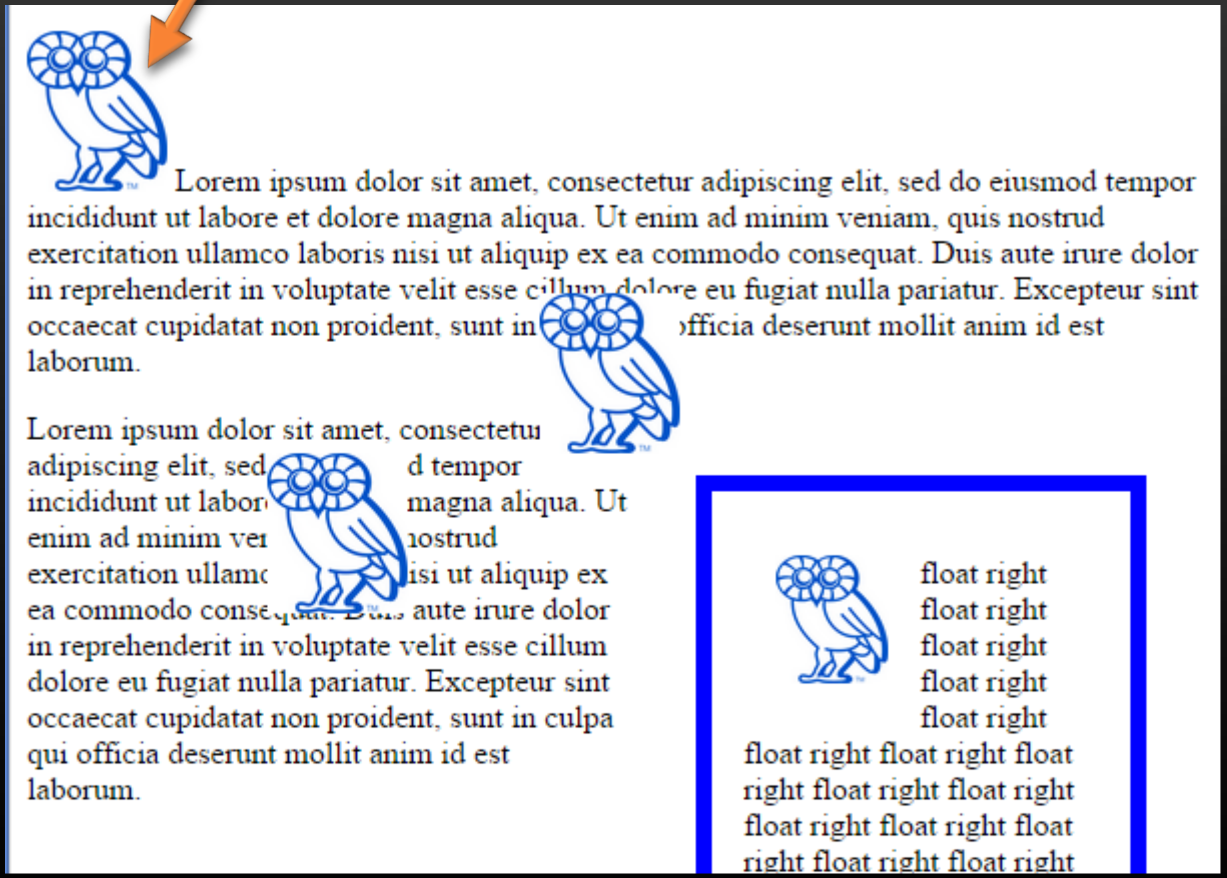
```
border-top-color: 🟦rgb(0, 0, 255);
border-top-style: solid;
border-top-width: 8px;
display: block;
float: right;
height: 212px;
margin-bottom: 32px;
margin-left: 32px;
margin-right: 32px;
margin-top: 32px;
padding-bottom: 16px;
padding-left: 16px;
padding-right: 16px;
padding-top: 16px;
width: 374.09375px;
```

https://www.clear.rice.edu/comp431/sample/css.html

Positioning

Visit the linked page to see how it functions with relation to resizing the screen and scrolling

Not so nice I think



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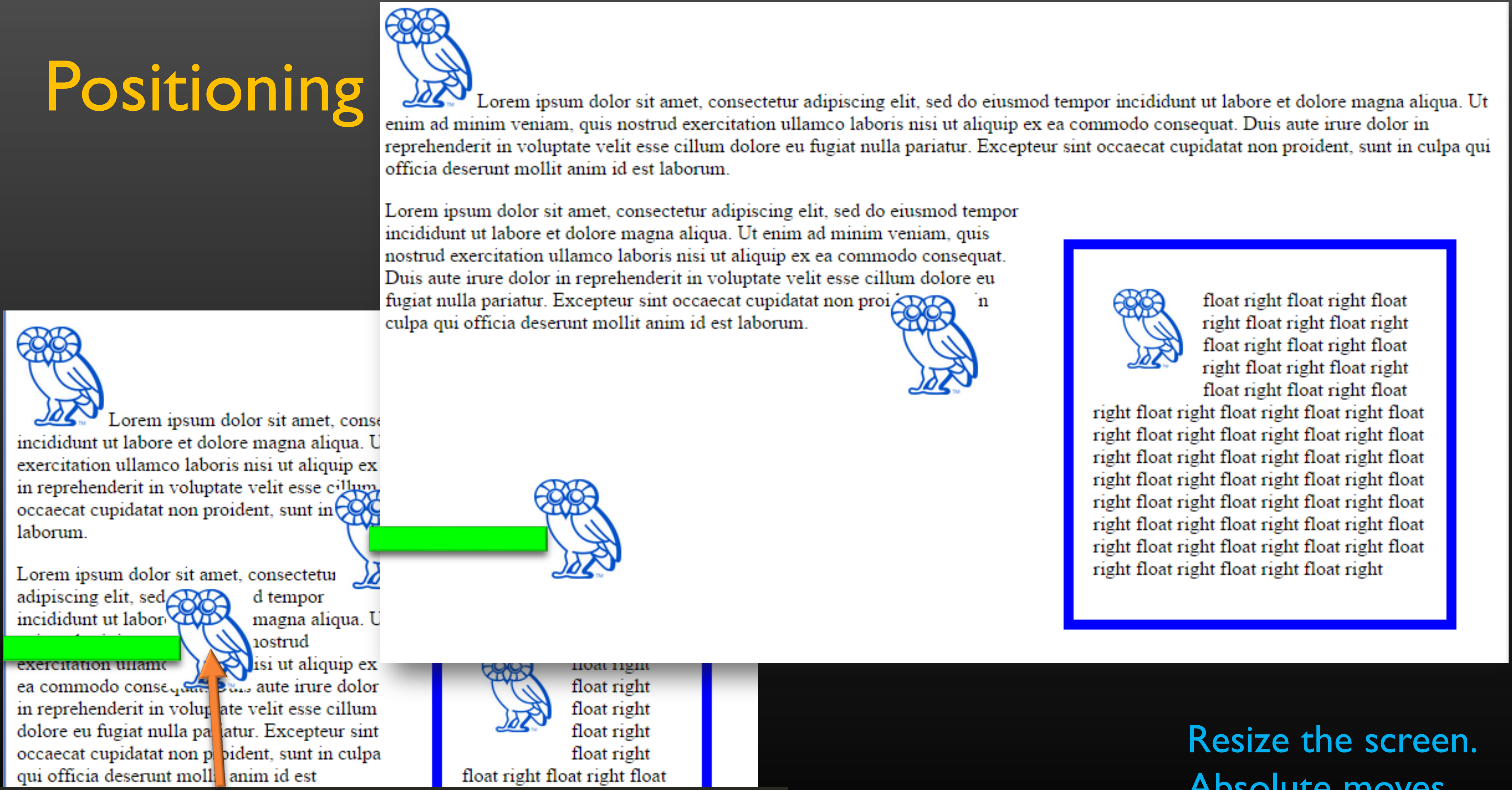
Positioning



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```
<img style="height: 5em;
position:absolute; left: 8em; top: 60em"
```

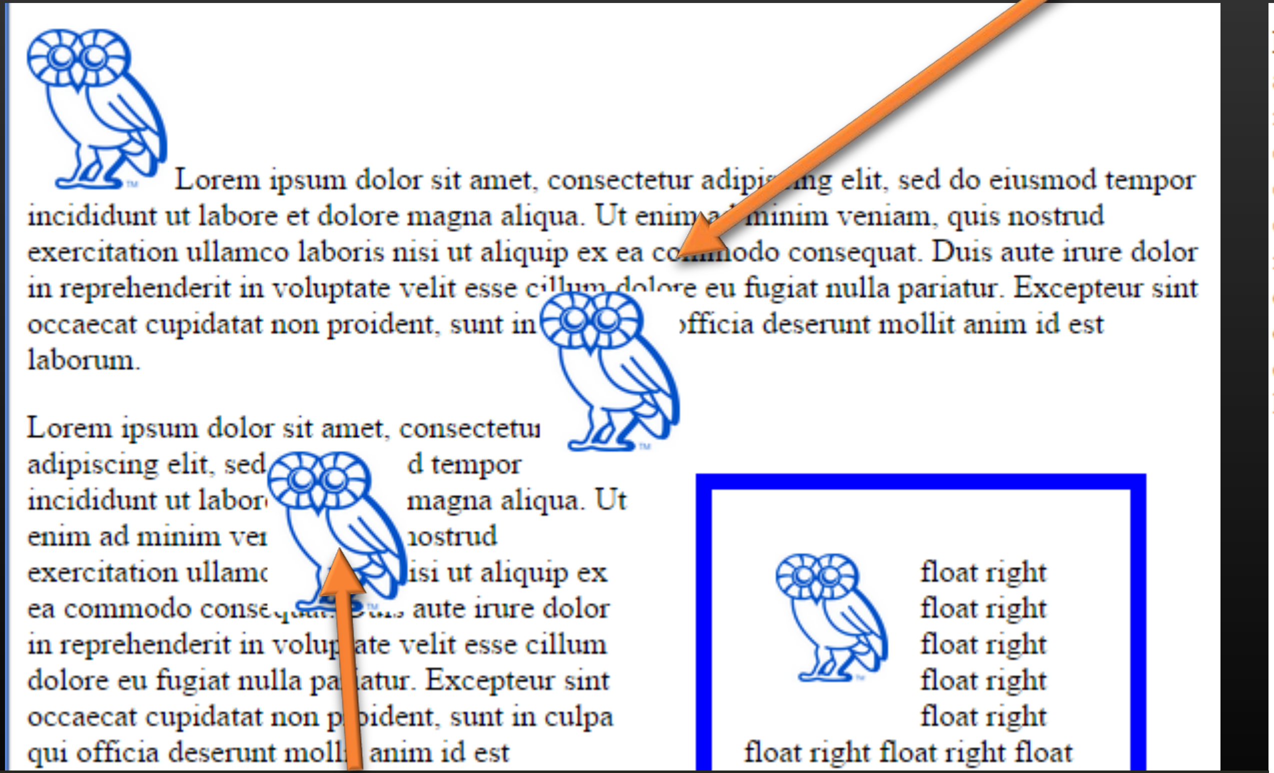
top/bottom, left/right

Resize the screen.
Absolute moves

Positioning

Scroll around, fixed stays fixed

```
<div style="position:fixed; left: 50%; top: 50%">
    <img style="height: 5em; position:relative; left: -2.5em"
</div>
```



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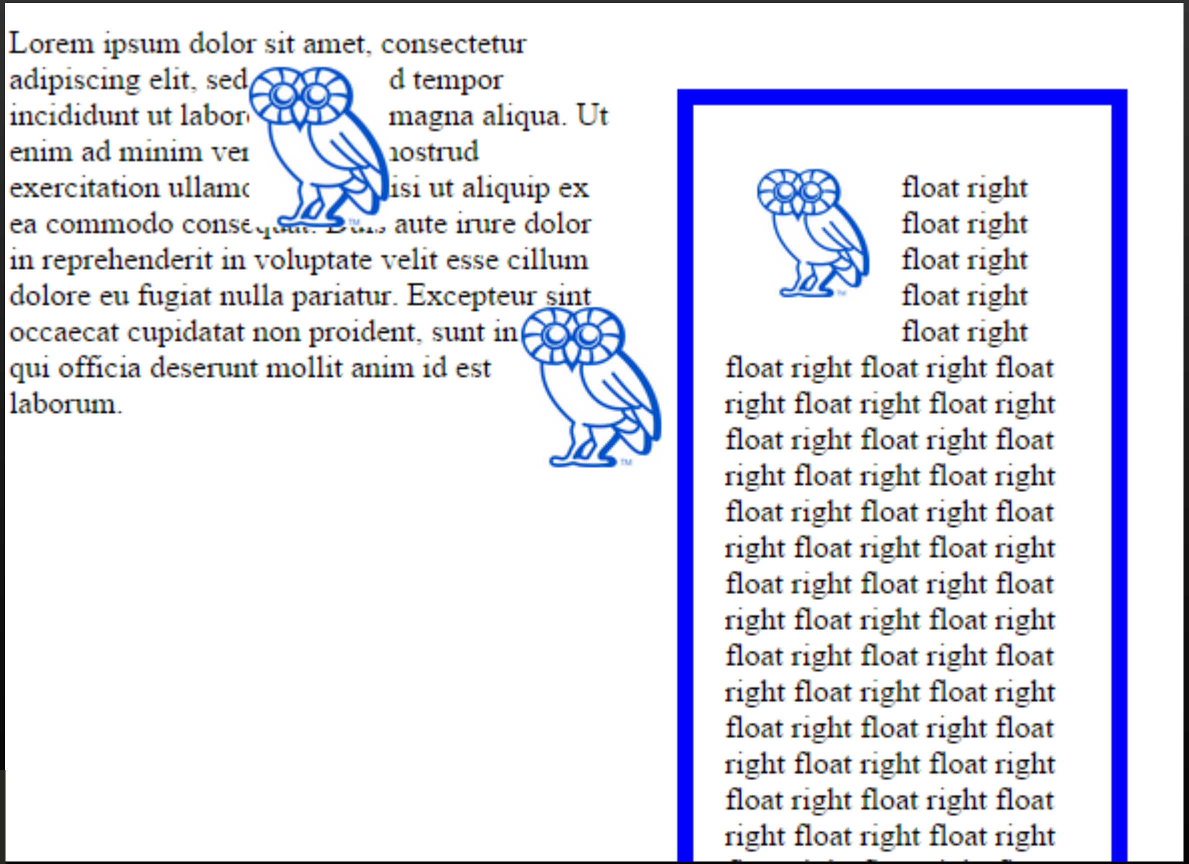
<img style="height: 5em;
position:absolute; left: 8em; top: 60em"
```



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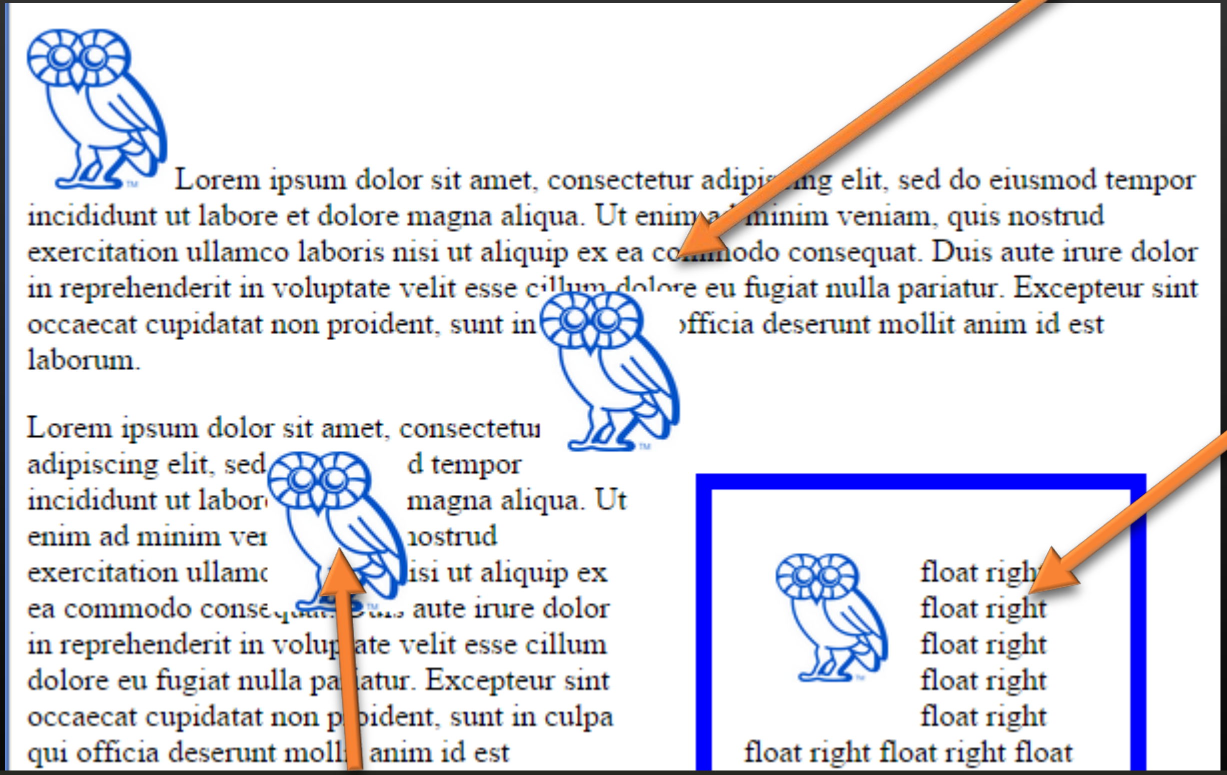
https://www.clear.rice.edu/comp431/sample/css.html

Positioning

```
<div style="position:fixed; left: 50%; top: 50%">
    <img style="height: 5em; position:relative; left: -2.5em"
</div>
```



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float right float right float right float right float right float right float right float

```
<div style="float:right; width: 30%;
border: 0.5em solid blue; padding: 1em;
margin: 2em">
    <img style="float:left; margin: 1em;
    height: 4em;" src="Rice_Owl_small.jpg">
    <p>
    float right float right float right
```

```
<img style="height: 5em;
position:absolute; left: 8em; top: 60em"
```

Recall: Inline vs Block

- We markup to control layout. Sometimes we want "blocks" of content that are positioned separately from other blocks.
- Other times we want inline layout or styling

Inline

<b>

<em>

<br>

<span>

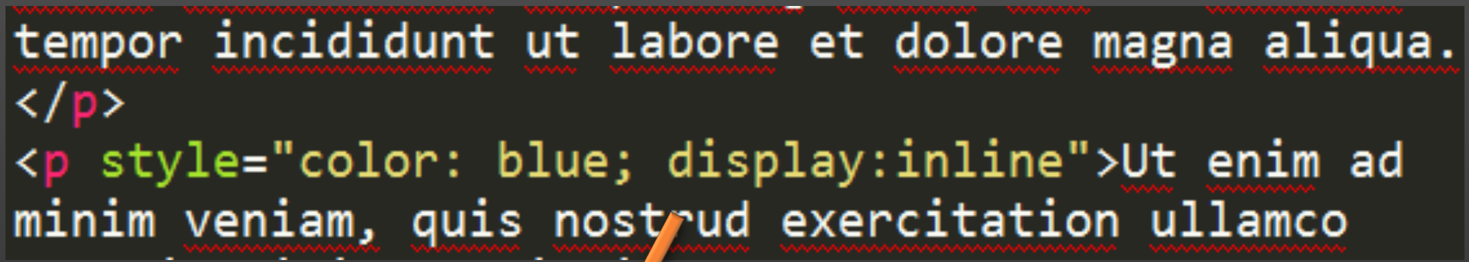
Block

<p>

<div>

We can control using *display*

Display



```
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</p>
<p style="color: blue; display:inline">Ut enim ad
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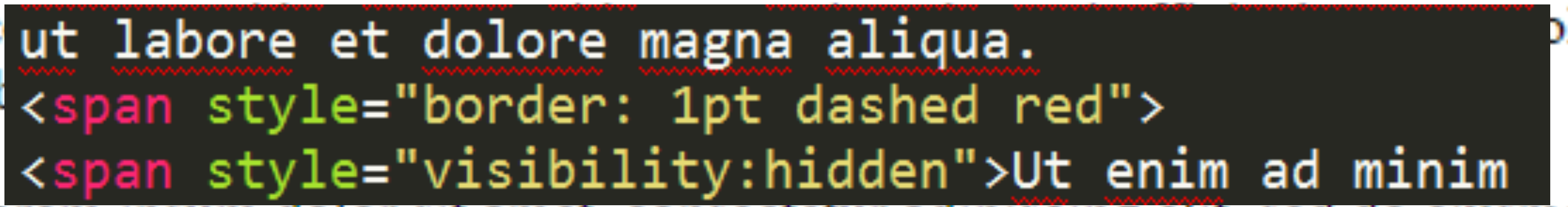

```
ut labore et dolore magna aliqua.
<span style="border: 1pt dashed red">
<span style="visibility:hidden">Ut enim ad minim
```

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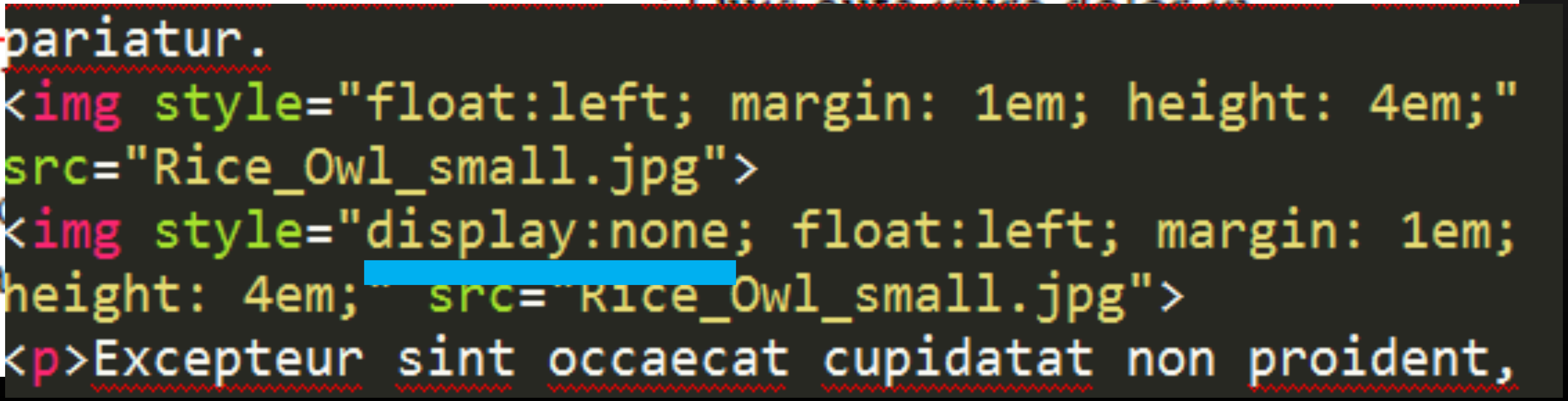

```
pariatur.
<img style="float:left; margin: 1em; height: 4em;"
src="Rice_Owl_small.jpg">
<img style="display:none; float:left; margin: 1em;
height: 4em;" src="Rice_Owl_small.jpg">
<p>Excepteur sint occaecat cupidatat non proident,
```

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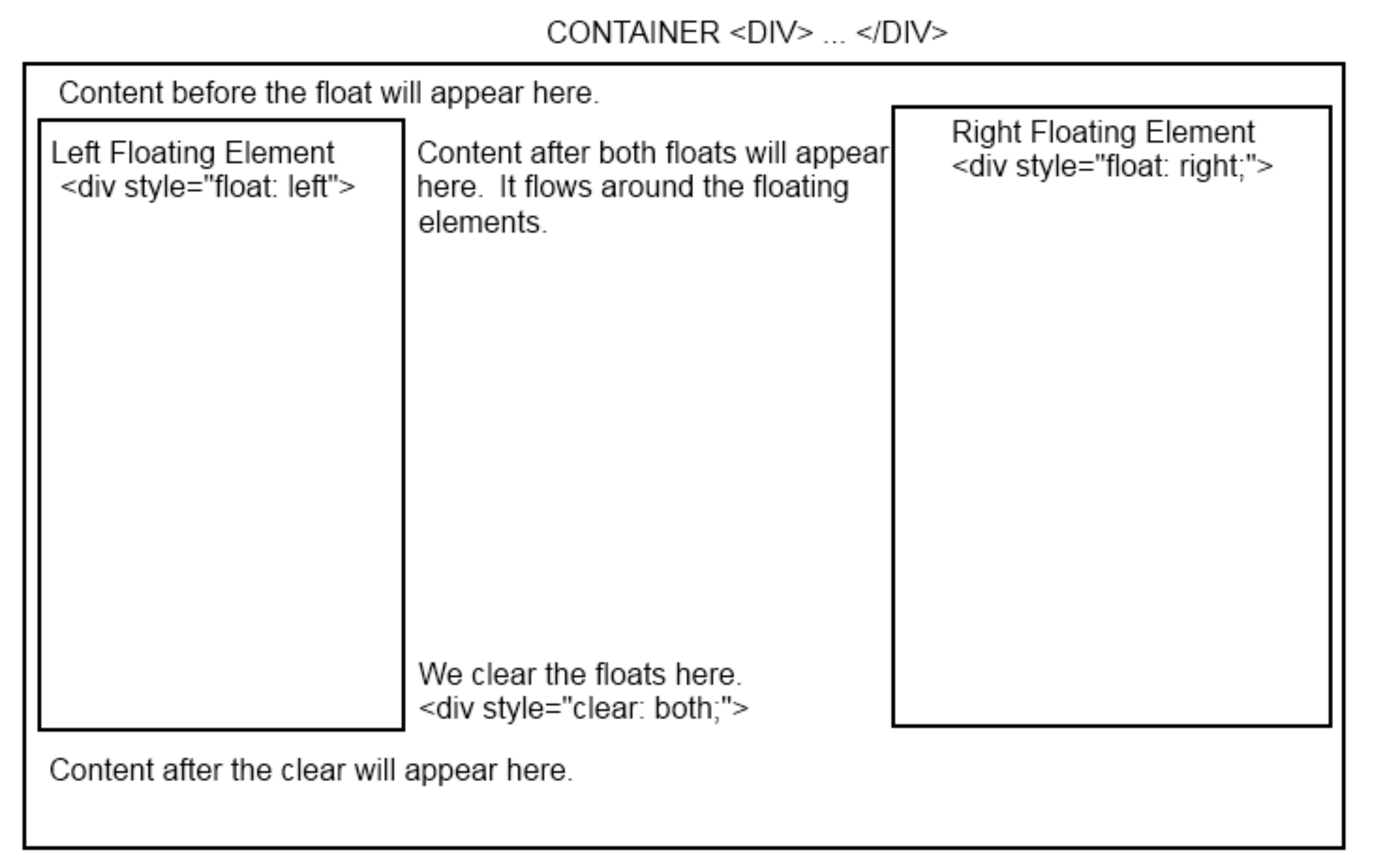


CONTAINER <DIV> ... </DIV>

Content before the float will appear here.

Left Floating Element
<div style="float: left">

Content after both floats will appear here. It flows around the floating elements.

Right Floating Element
<div style="float: right;">

We clear the floats here.
<div style="clear: both;">

Content after the clear will appear here.

More more more !!!

- Text-align: (left|center|right|justify)
- Vertical-align: (baseline|sub|super|top|text-top|middle|…)
- Text-shadow: 0.1em 0.1em #ff0022;
- Max-width / min-width / max-height / min-height
- Border-radius
- outline
- Box-shadow
- Overflow: (visible|hidden|scroll|auto|inherit)
- Positioning z-index
- Cursor: (crosshair|default|pointer|…)
- Transition
- Transform
- Opacity
- Filter
- gradients

Non-inline CSS: Selectors

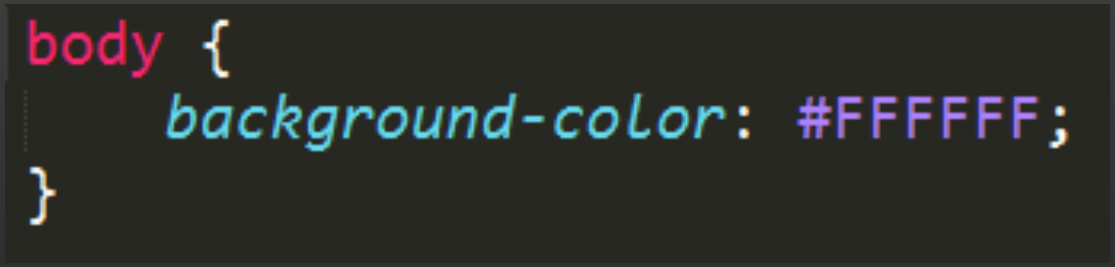
```
/* CSS Comment */
selector {
    key: value;
}
```

- No nesting
- Selectors are “rules”

```
        div > tr.fancy #rule
```

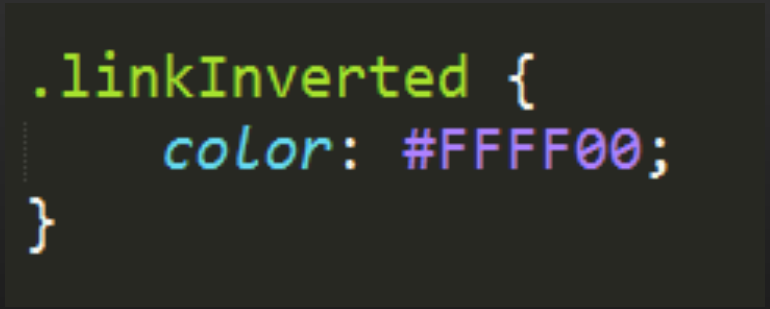
Selector Rules (the easy ones)

- Tag



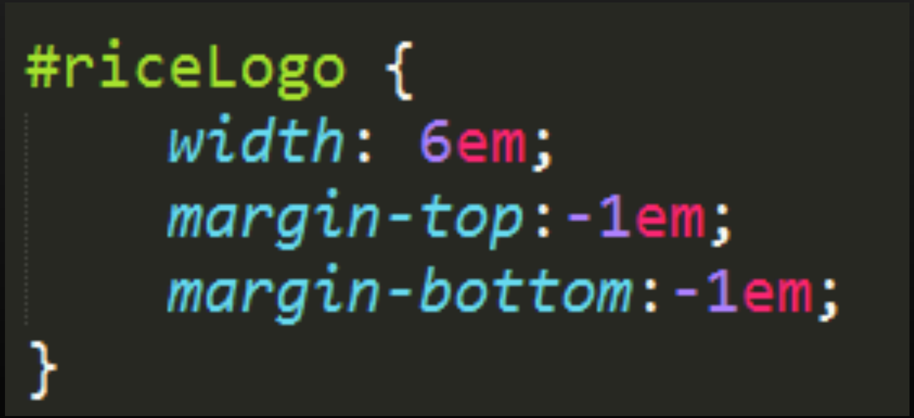
```css
body {
    background-color: #FFFFFF;
}
```

- Class



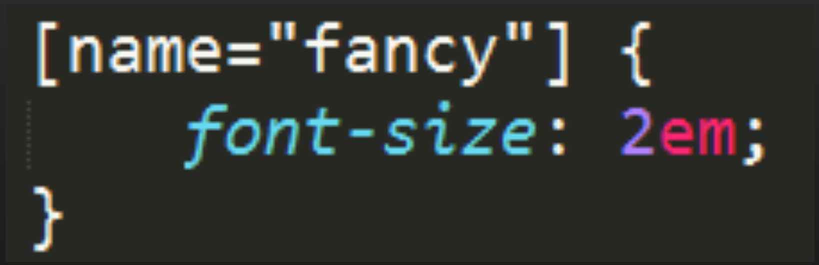
```css
.linkInverted {
    color: #FFFF00;
}
```

- Id



```css
#riceLogo {
    width: 6em;
    margin-top:-1em;
    margin-bottom:-1em;
}
```

- Attribute



```css
[name="fancy"] {
    font-size: 2em;
}
```

Selector Rules (some combinators)

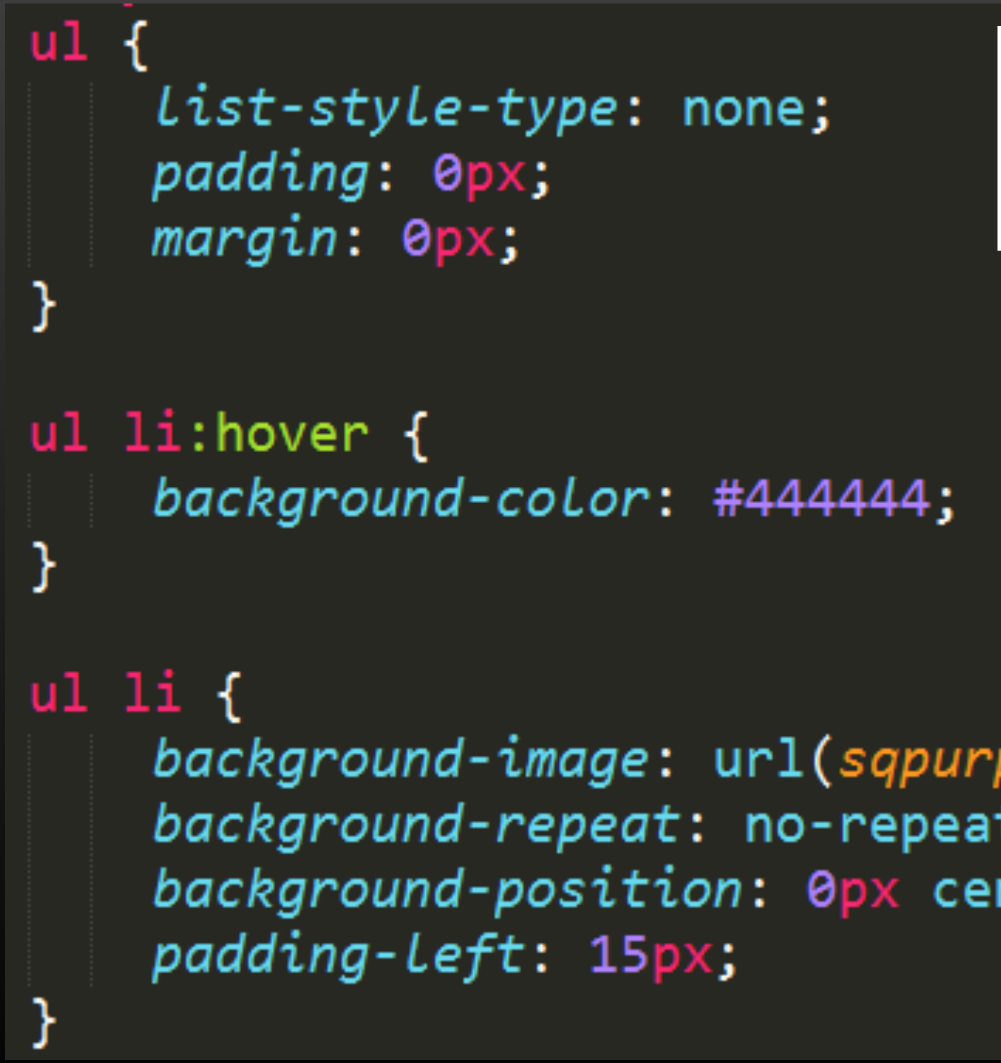
- div, p
  - Select all <div> and all <p>

- div p
  - Select all <p> directly within a <div>

- div > p
  - Select all <p> with an eventual parent of <div>

(slightly edited)

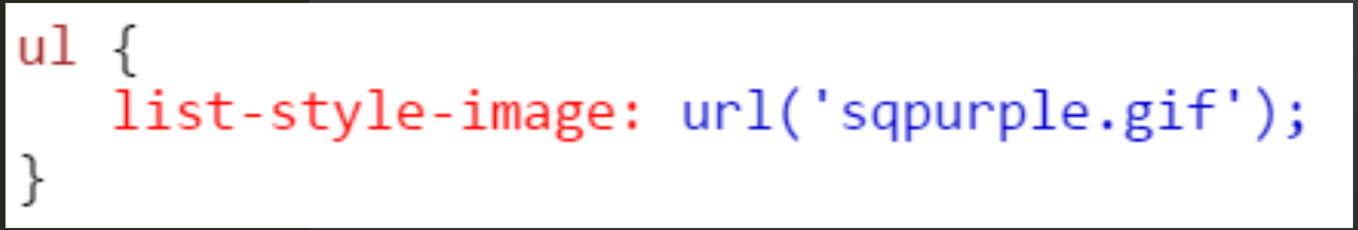
cross-browser example from w3schools



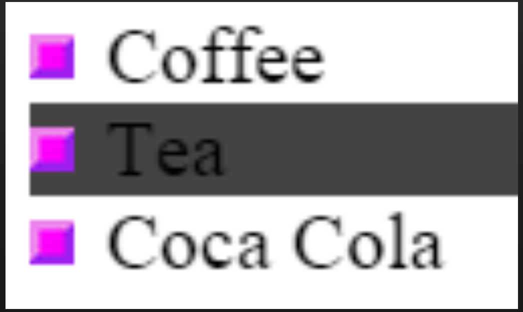
```
ul {
    list-style-type: none;
    padding: 0px;
    margin: 0px;
}

ul li:hover {
    background-color: #444444;
}

ul li {
    background-image: url(sqpurple.gif);
    background-repeat: no-repeat;
    background-position: 0px center;
    padding-left: 15px;
}
```



```
ul {
    list-style-image: url('sqpurple.gif');
}
```



- Coffee
- Tea
- Coca Cola

:hover is a "state selector"
:active, :focus, :link, :visited,
…

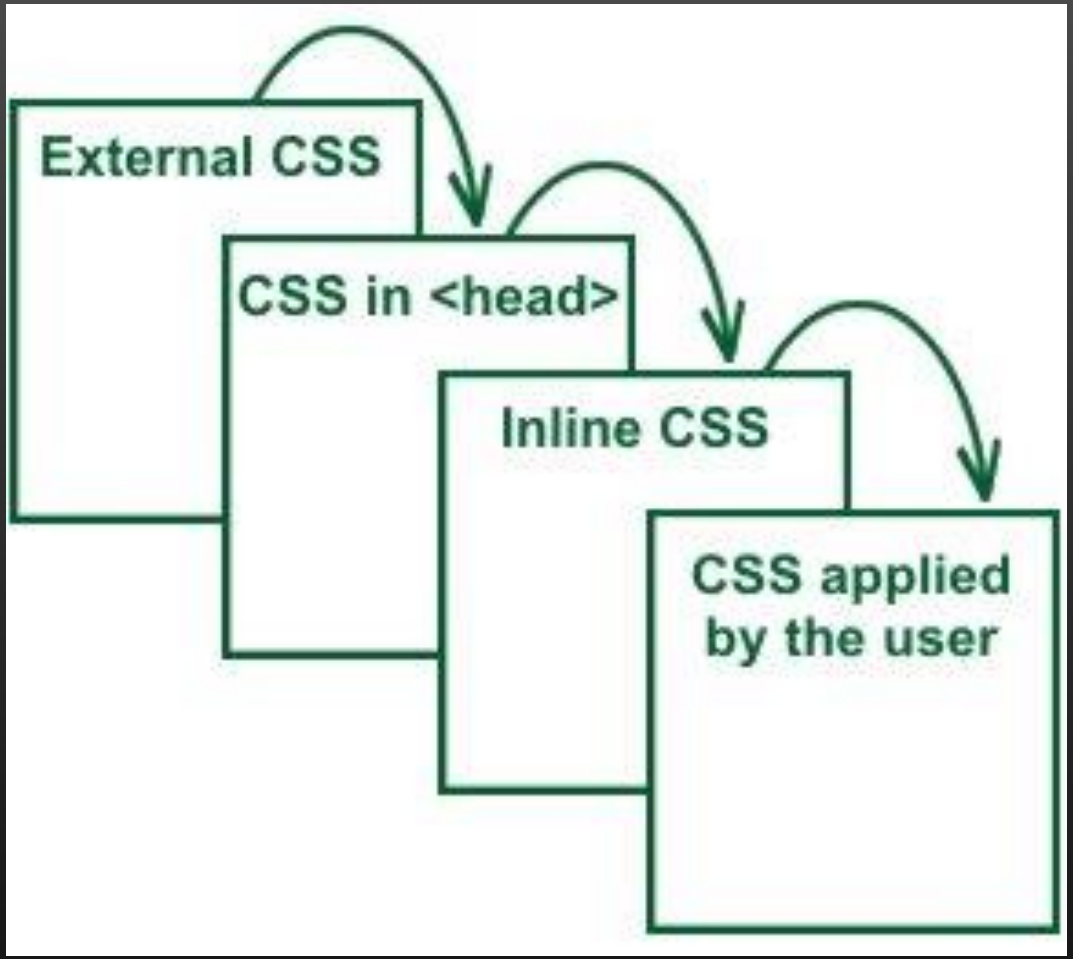
… spaces matter in selectors

- div.myclass#myid
  - Selects `<div class=“myclass” id=“myid”>`
- div .myclass #myid
  - Selects some element with id=“myid” that is contained within an element with class=“myclass” that is contained within a <div>. E.g.,

  -
    ```
    <div>
        <span class=“myclass”>
            <input id=“myid” type=“text”>
    ```

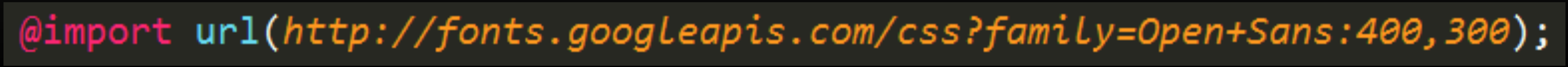
Cascading

- Style sheets cascade
- Externally imported or linked sheets
  - In order
- Followed by internal styles
- Then inline
- Finally overrides in the browser



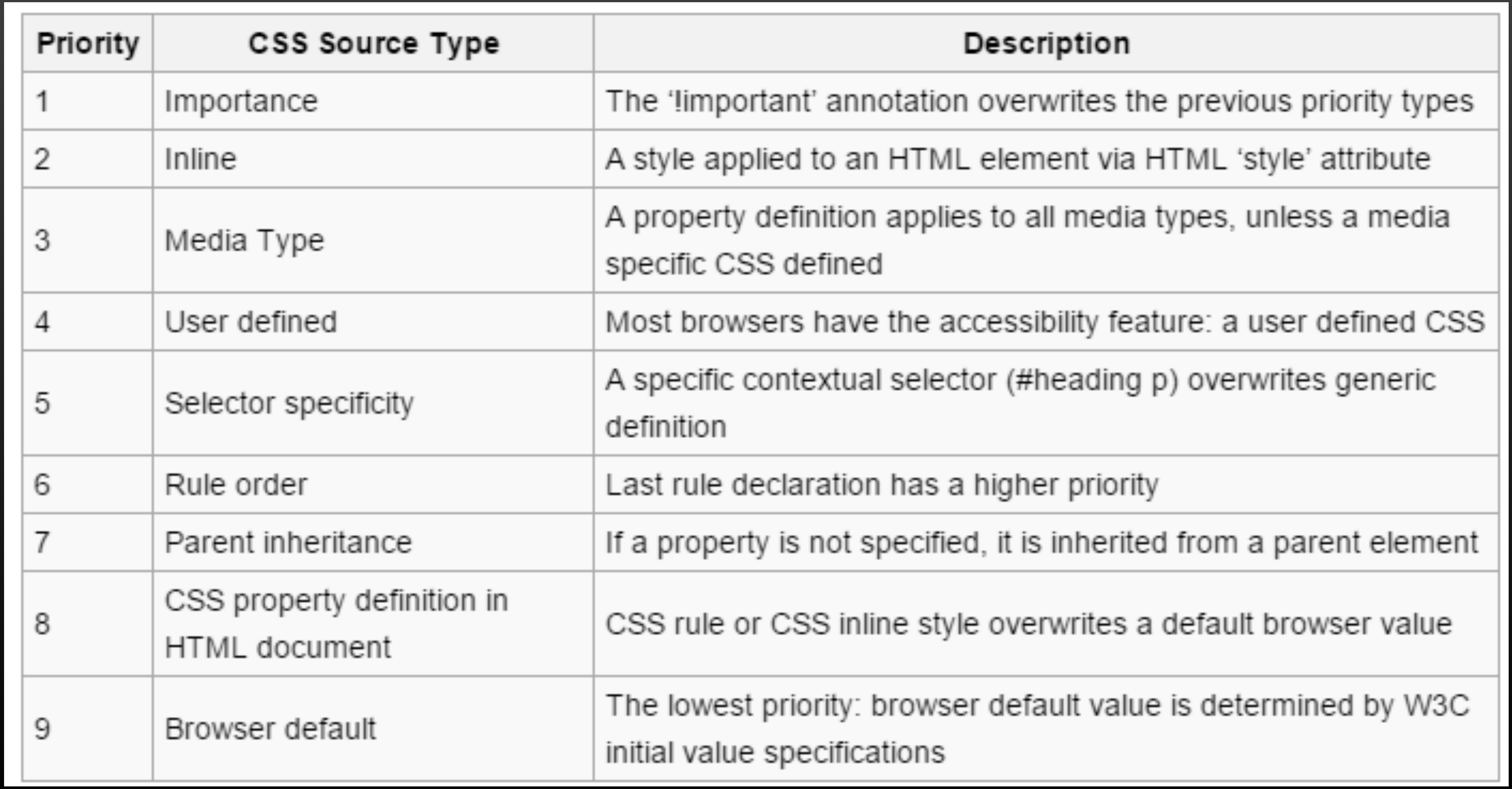
- Not everything cascades. E.g., border doesn't.

  border: inherit



```
@import url(http://fonts.googleapis.com/css?family=Open+Sans:400,300);
```

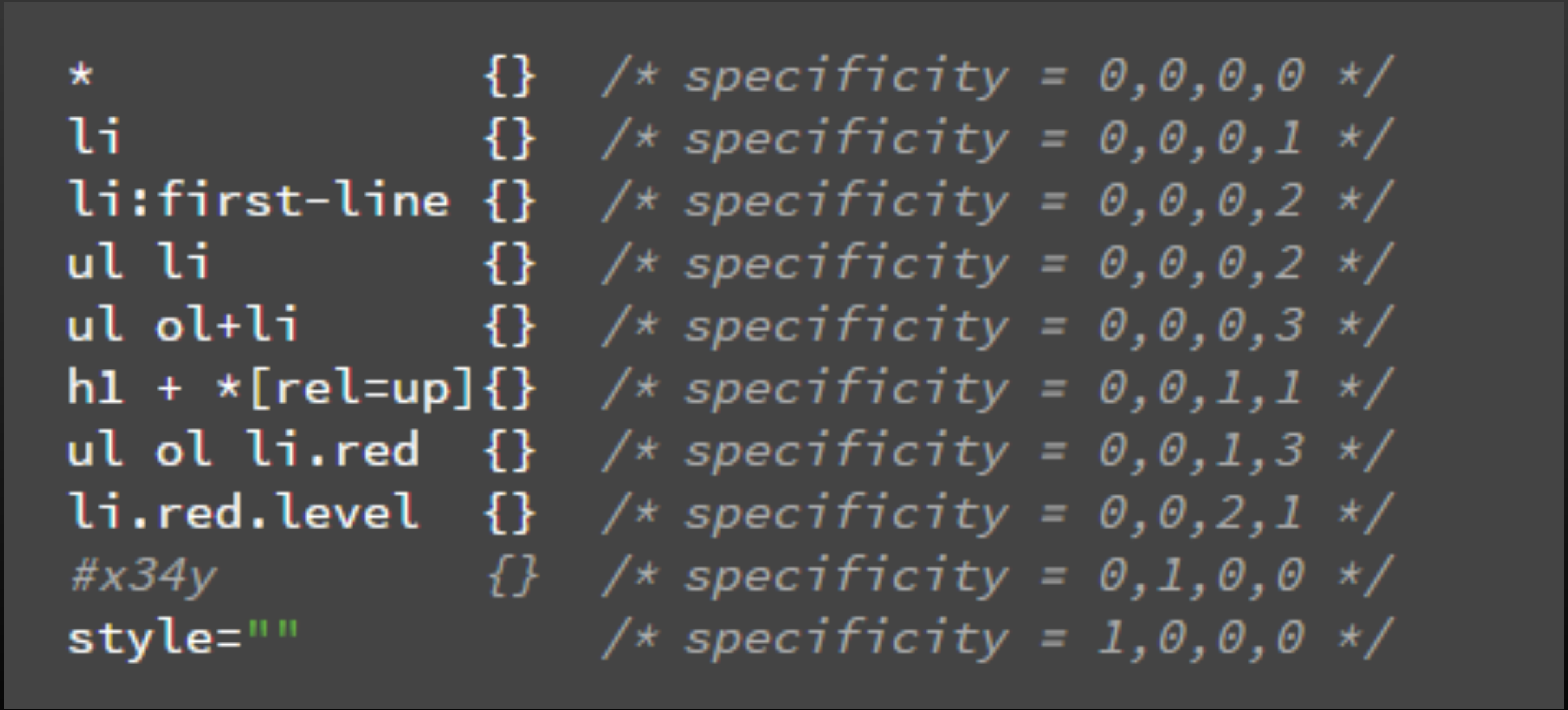
Style Cascade Order *(in reverse)*



Priority	CSS Source Type	Description
1	Importance	The ‘!important’ annotation overwrites the previous priority types
2	Inline	A style applied to an HTML element via HTML ‘style’ attribute
3	Media Type	A property definition applies to all media types, unless a media specific CSS defined
4	User defined	Most browsers have the accessibility feature: a user defined CSS
5	Selector specificity	A specific contextual selector (#heading p) overwrites generic definition
6	Rule order	Last rule declaration has a higher priority
7	Parent inheritance	If a property is not specified, it is inherited from a parent element
8	CSS property definition in HTML document	CSS rule or CSS inline style overwrites a default browser value
9	Browser default	The lowest priority: browser default value is determined by W3C initial value specifications

Style Computation by Specificity

(style attribute),(id),(attributes+class),(element)



```
*             {}  /* specificity = 0,0,0,0 */
li            {}  /* specificity = 0,0,0,1 */
li:first-line {}  /* specificity = 0,0,0,2 */
ul li         {}  /* specificity = 0,0,0,2 */
ul ol+li      {}  /* specificity = 0,0,0,3 */
h1 + *[rel=up]{}  /* specificity = 0,0,1,1 */
ul ol li.red  {}  /* specificity = 0,0,1,3 */
li.red.level  {}  /* specificity = 0,0,2,1 */
#x34y         {}  /* specificity = 0,1,0,0 */
style=""          /* specificity = 1,0,0,0 */
```

http://www.html5rocks.com/en/tutorials/internals/howbrowserswork/

Something to consider: Desktop vs Mobile

- Different sized viewports
- Text flow
- Layout
- Scaling and zooming

The Drive for Style

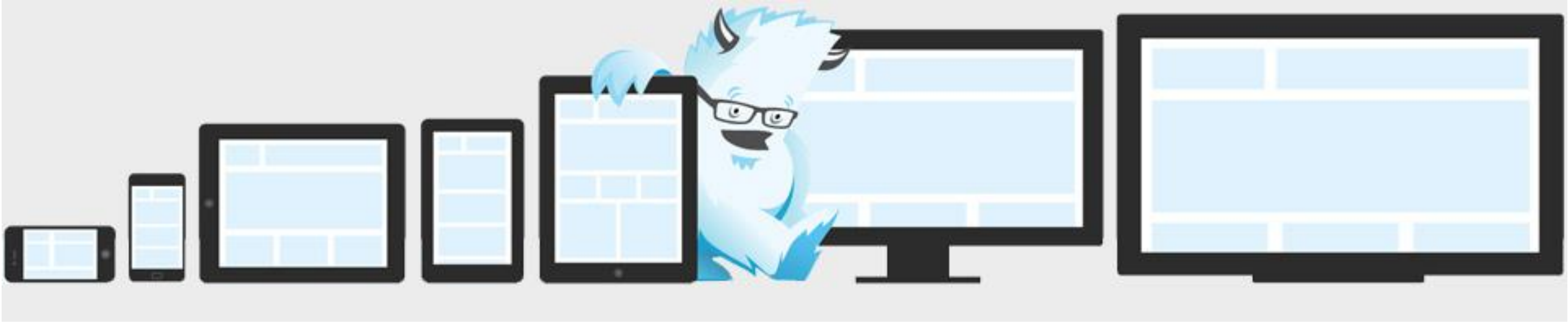
- We want awesome looking web pages
- Writing a bunch of CSS styling is… hard
- Especially having to do it multiple times for various devices
- Someone else has already done it for us
- Let’s build on the shoulders of giants

(Responsive) Style Frameworks

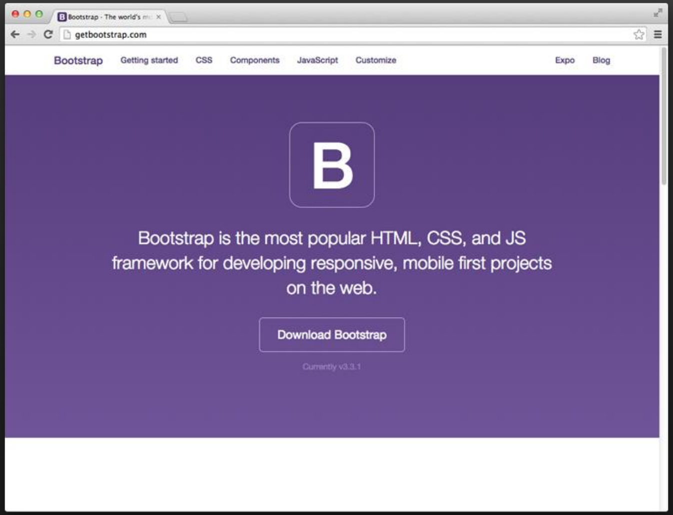
- Wikipedia says:

> - **Frameworks** are pre-prepared software frameworks that are meant to allow for easier, more standards-compliant web design using CSS
> - Most of these frameworks contain at least a grid.
> - More functional frameworks also come with more features and additional JavaScript based functions, but are mostly design oriented and unobtrusive.
> - This differentiates these from functional and full JS frameworks.

Responsive Framework



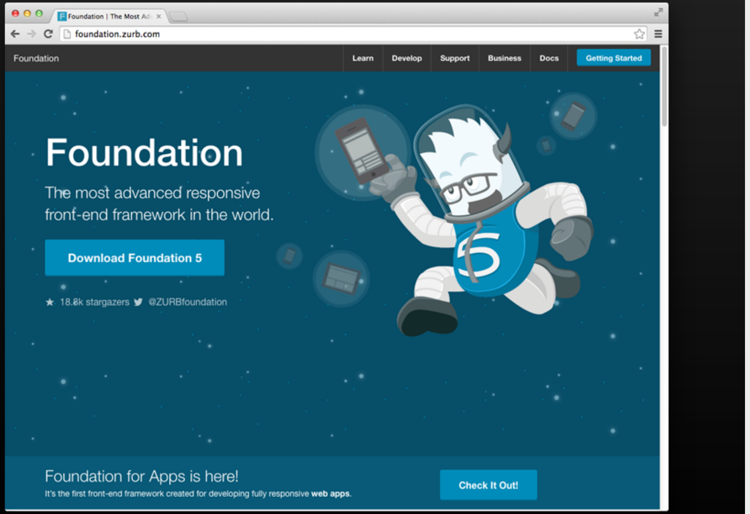
The Top Contenders *(not rigorously determined…)*



Bootstrap - The world's m…

getbootstrap.com

Bootstrap is the most popular HTML, CSS, and JS framework for developing responsive, mobile first projects on the web.



Foundation | The Most Ad…

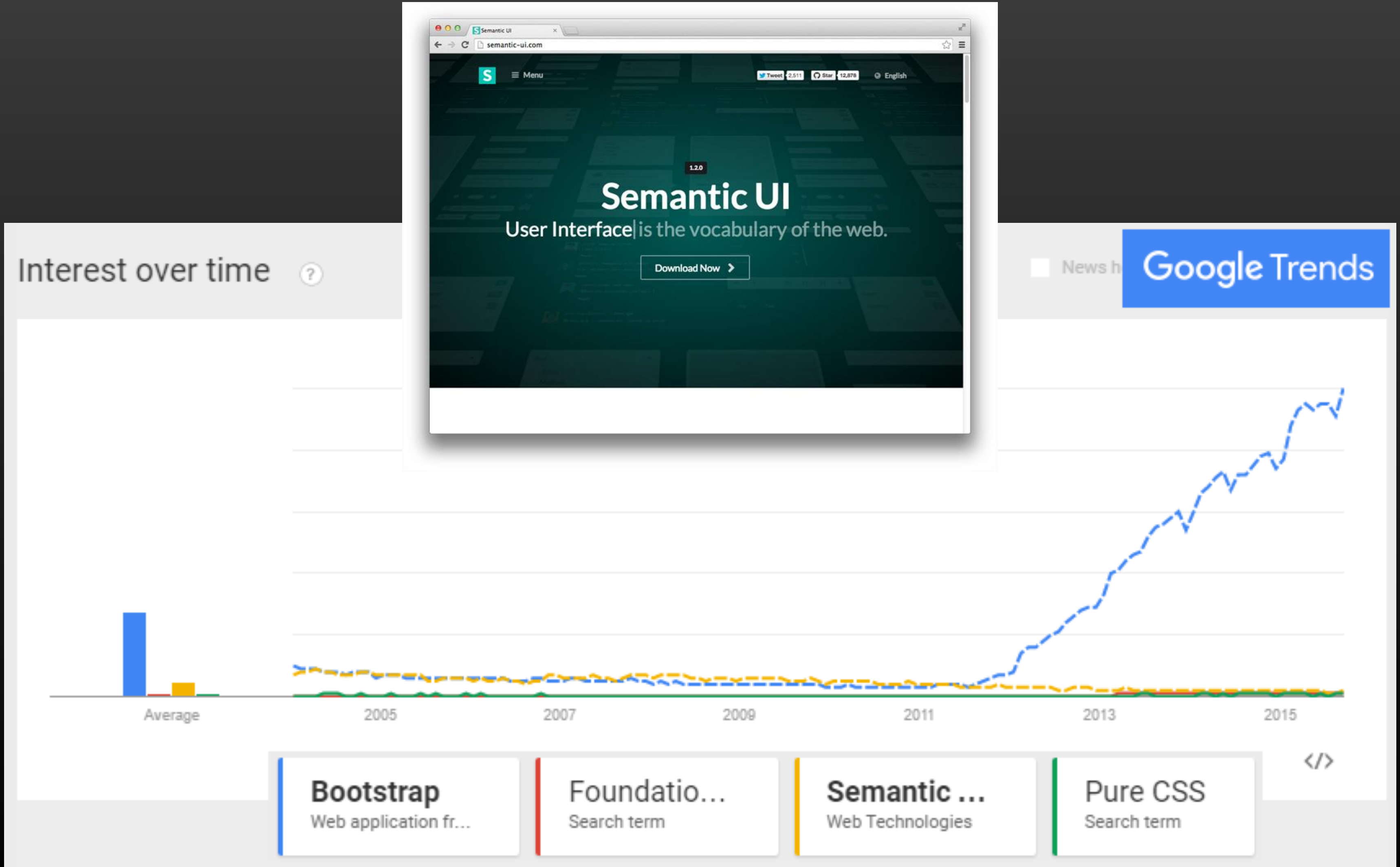
foundation.zurb.com

Foundation

The most advanced responsive front-end framework in the world.

Foundation for Apps is here!

It's the first front-end framework created for developing fully responsive web apps.



Semantic UI

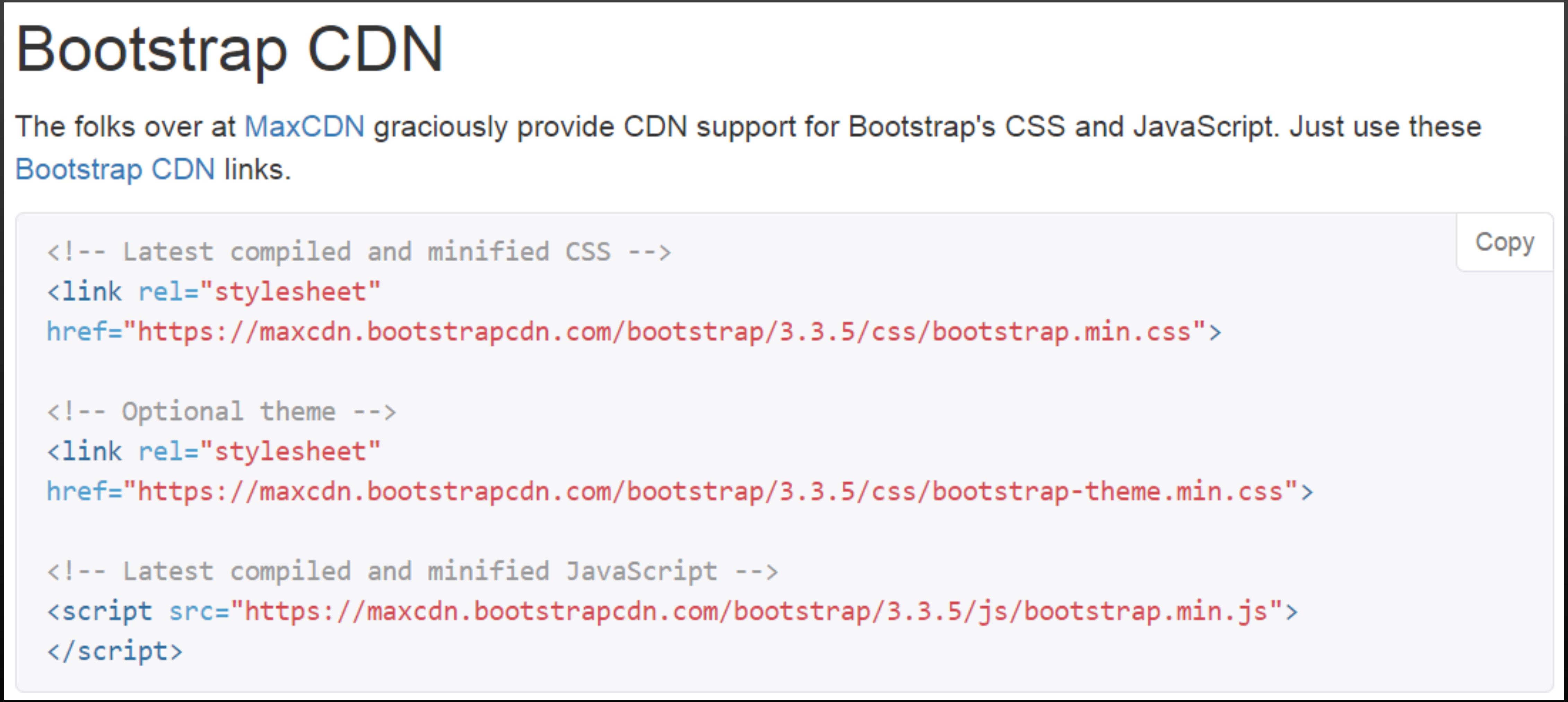
semantic-ui.com

Semantic UI

User Interface is the vocabulary of the web.

Bootstrap	Foundatio…	Semantic …	Pure CSS
Web application fr…	Search term	Web Technologies	Search term

Installing Bootstrap



Bootstrap CDN

The folks over at MaxCDN graciously provide CDN support for Bootstrap's CSS and JavaScript. Just use these Bootstrap CDN links.

```
<!-- Latest compiled and minified CSS -->
<link rel="stylesheet"
href="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.5/css/bootstrap.min.css">

<!-- Optional theme -->
<link rel="stylesheet"
href="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.5/css/bootstrap-theme.min.css">

<!-- Latest compiled and minified JavaScript -->
<script src="https://maxcdn.bootstrapcdn.com/bootstrap/3.3.5/js/bootstrap.min.js">
</script>
```

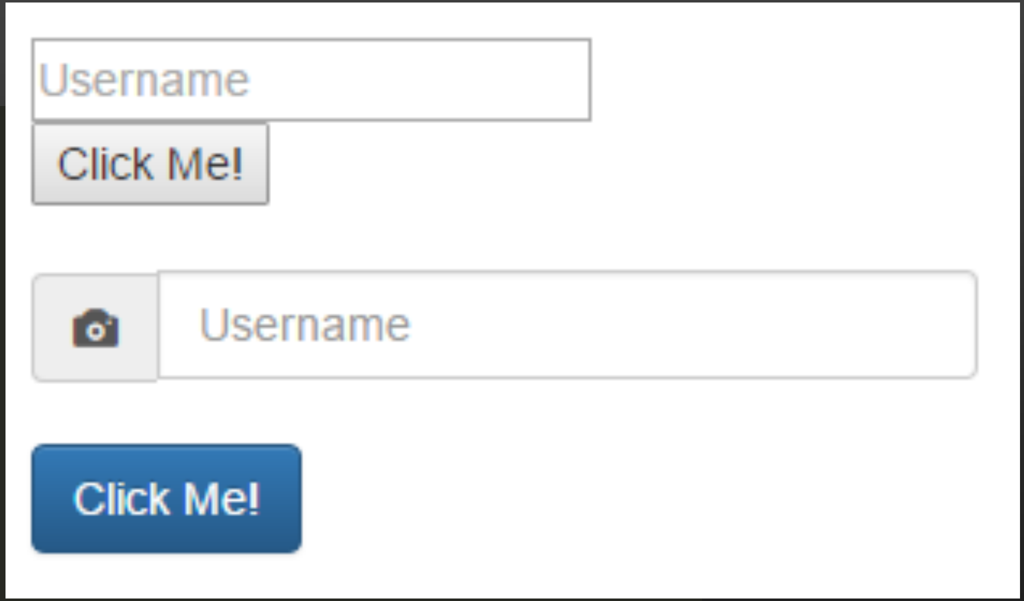
http://getbootstrap.com/
http://www.w3schools.com/bootstrap/

Using Bootstrap

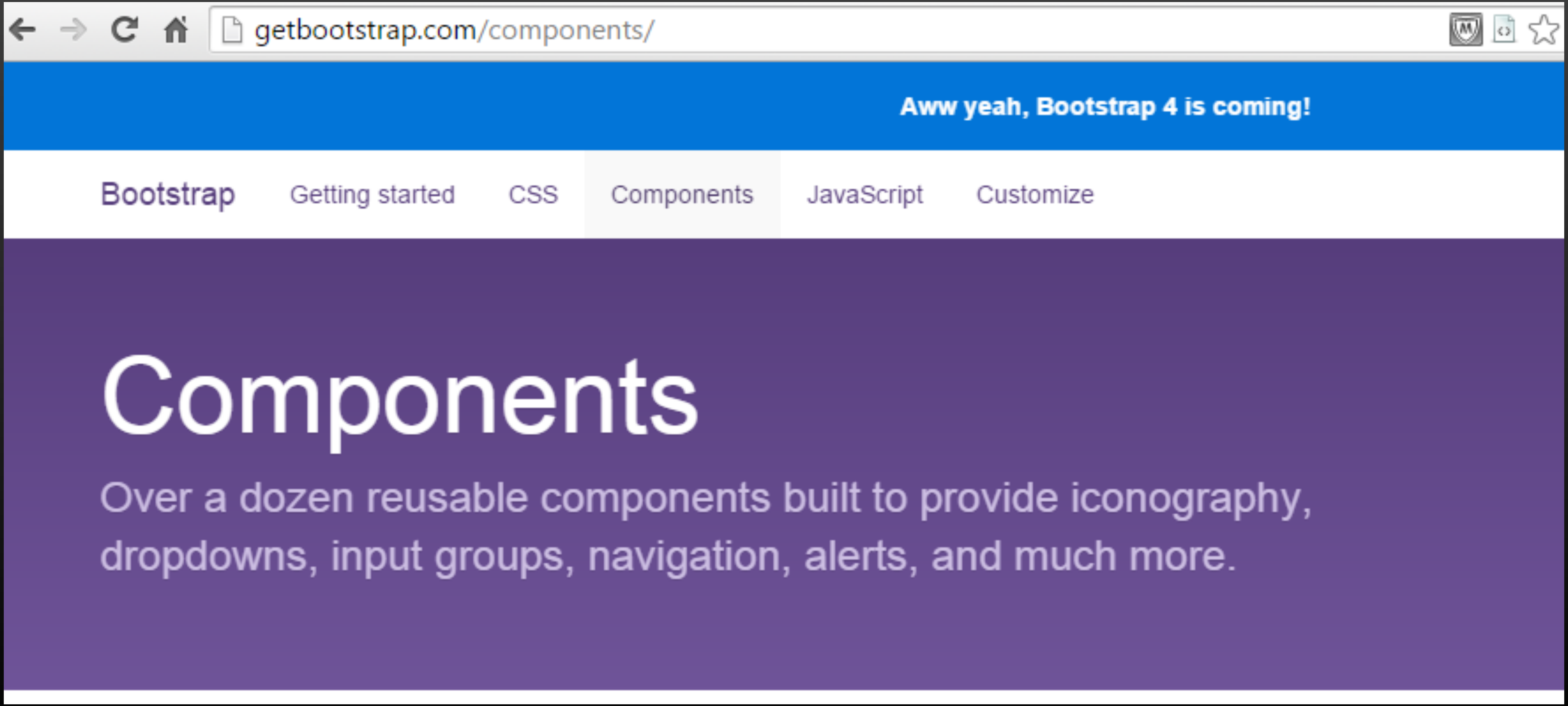
```
<input type="text" placeholder="Username">
<br>
<input type="button" value="Click Me!">

<br><br>

<div class="row">
  <div class="col-xs-6 col-md-3">
    <div class="input-group">
      <span class="input-group-addon glyphicon glyphicon-camera">
      </span>
      <input type="text" class="form-control" placeholder="Username">
    </div>
    <br><input type="button" class="btn btn-primary" value="Click Me!">
  </div>
</div>
```



More Bootstrap



Aww yeah, Bootstrap 4 is coming!

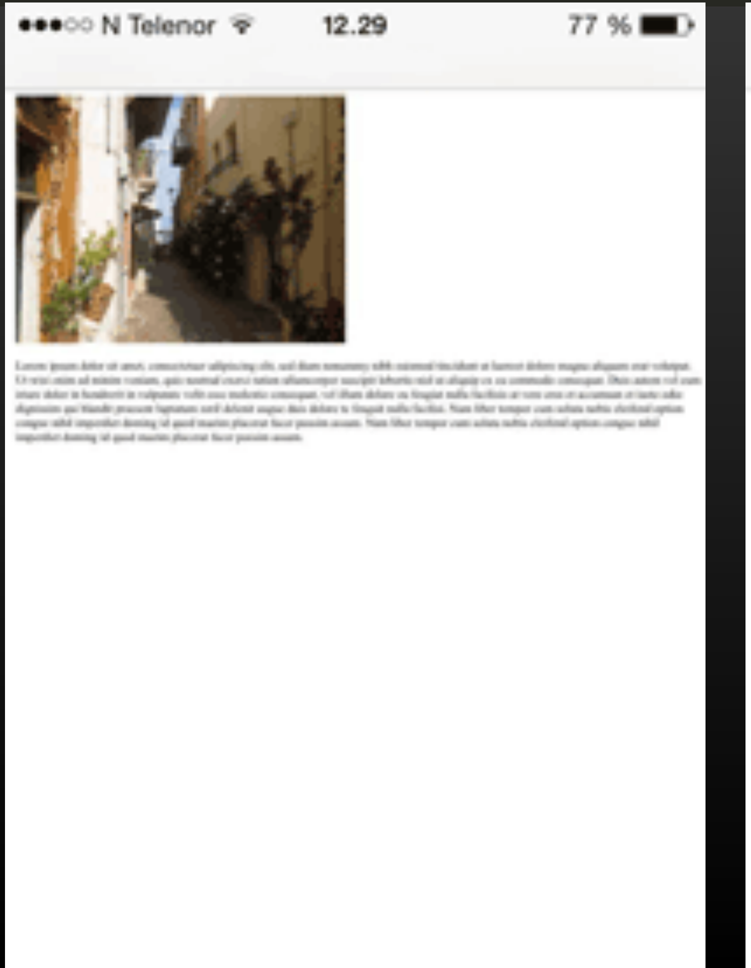
Components

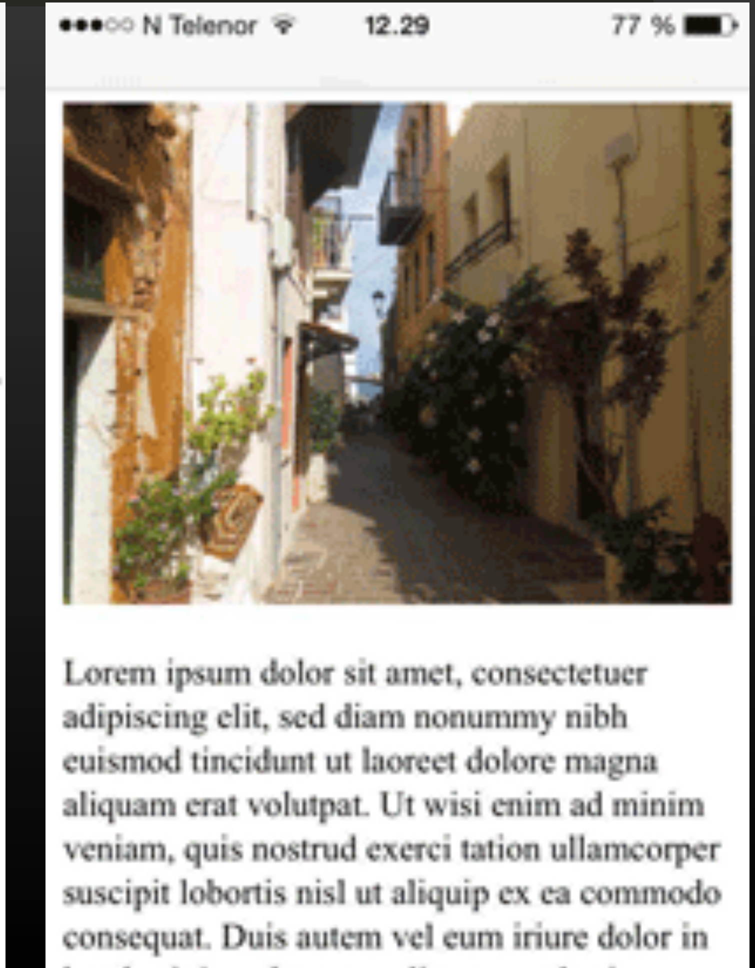
Over a dozen reusable components built to provide iconography, dropdowns, input groups, navigation, alerts, and much more.

Viewport

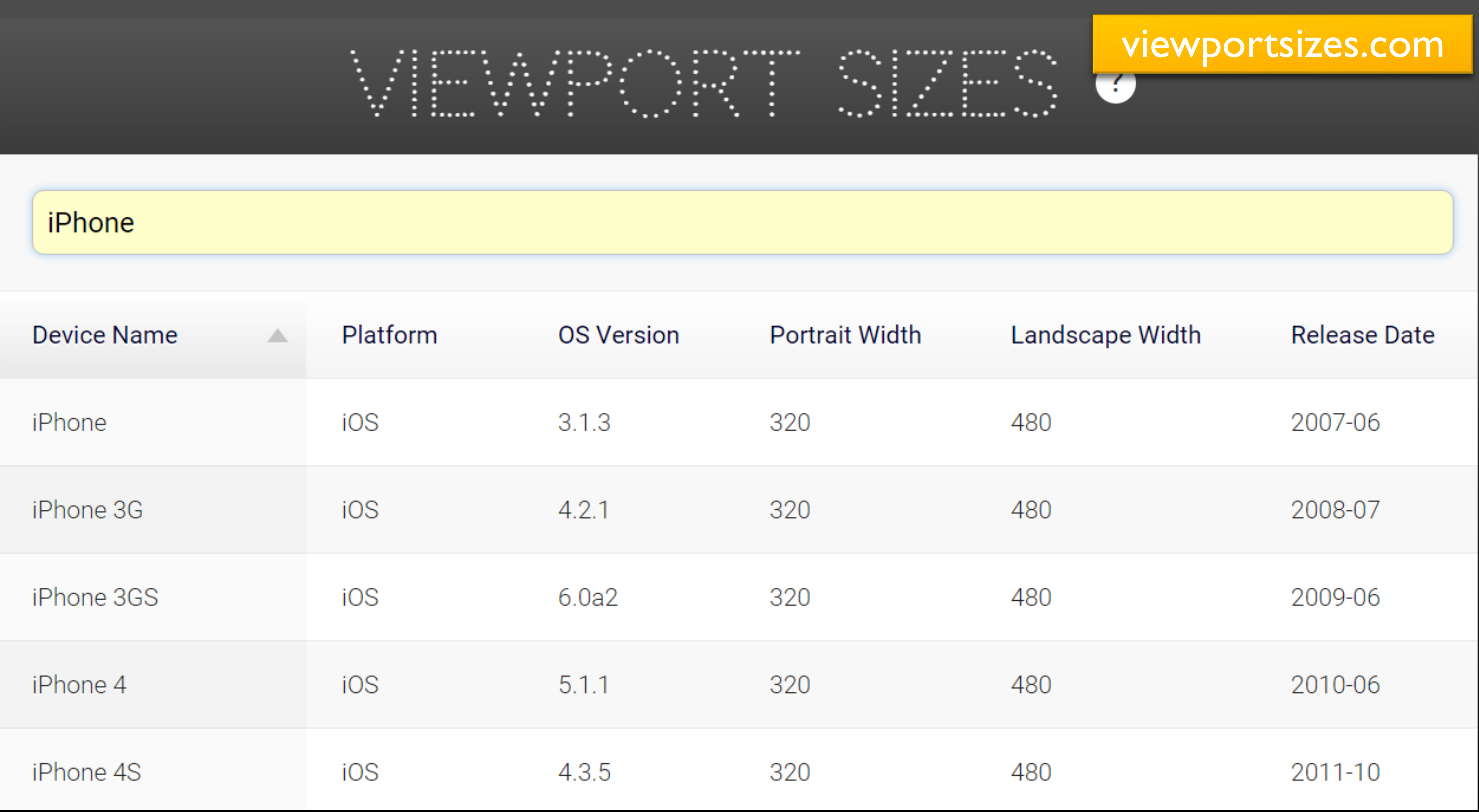
```
<meta name="viewport" content="width=device-width, initial-scale=1">
```

- User “viewable” area
- Set the width to the device–width
- Set the initial scaling





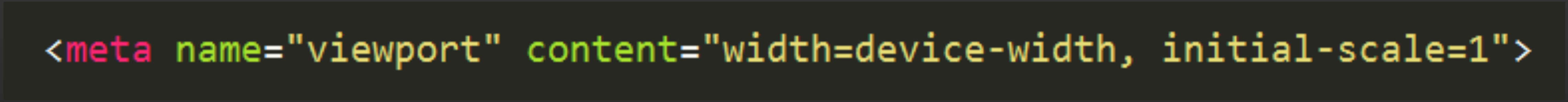
Lorem ipsum dolor sit amet, consectetuer adipiscing elit, sed diam nonummy nibh euismod tincidunt ut laoreet dolore magna aliquam erat volutpat. Ut wisi enim ad minim veniam, quis nostrud exerci tation ullamcorper suscipit lobortis nisl ut aliquip ex ea commodo consequat. Duis autem vel eum iriure dolor in


viewportsizes.com

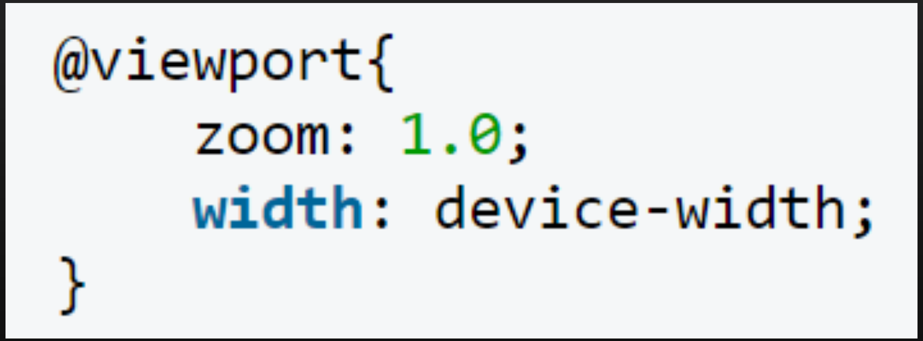
VIEWPORT SIZES

Device Name ▲	Platform	OS Version	Portrait Width	Landscape Width	Release Date
iPhone	iOS	3.1.3	320	480	2007-06
iPhone 3G	iOS	4.2.1	320	480	2008-07
iPhone 3GS	iOS	6.0a2	320	480	2009-06
iPhone 4	iOS	5.1.1	320	480	2010-06
iPhone 4S	iOS	4.3.5	320	480	2011-10

Viewport <meta> vs CSS



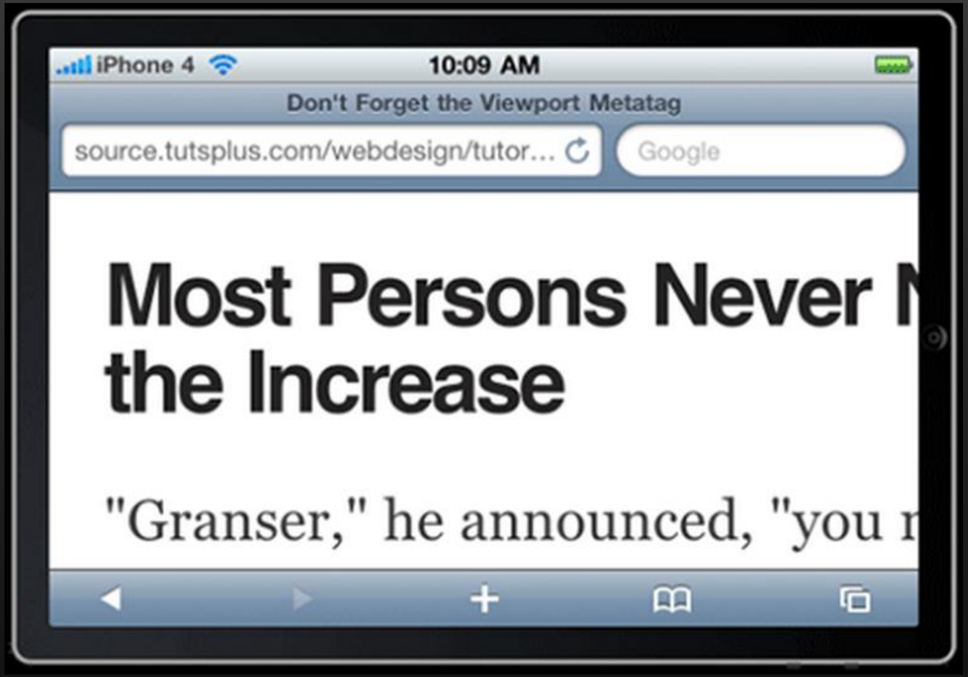
```
<meta name="viewport" content="width=device-width, initial-scale=1">
```



```
@viewport{
    zoom: 1.0;
    width: device-width;
}
```

Recommendation:
Do both.

Viewing in Landscape



iPhone 4 10:09 AM

Don't Forget the Viewport Metatag

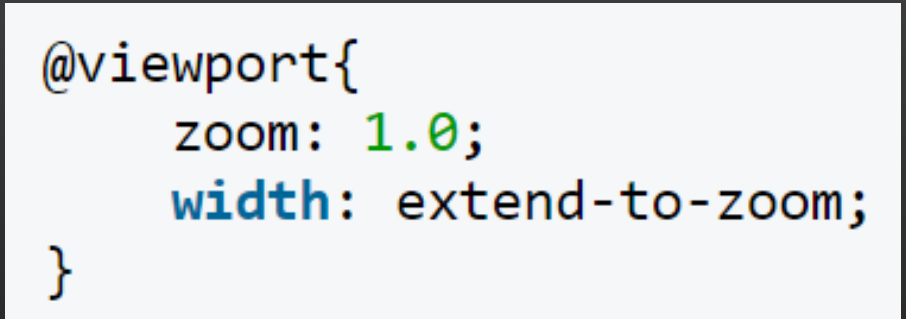
source.tutsplus.com/webdesign/tutor...

Most Persons Never N
the Increase

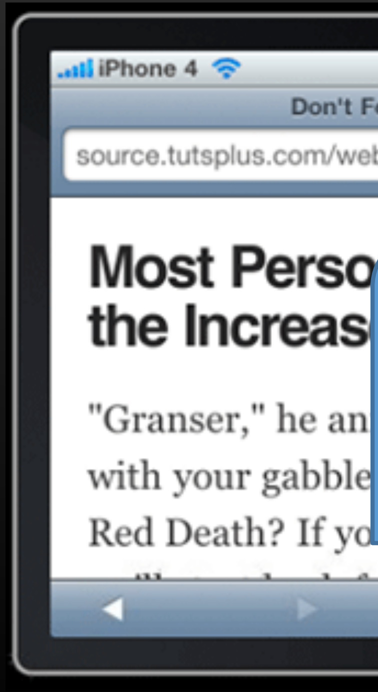
"Granser," he announced, "you r

width=device-height

Don't set width? only scale/zoom?



```
@viewport{
    zoom: 1.0;
    width: extend-to-zoom;
}
```



iPhone 4 10:11 AM

Don't Forget the Viewport Metatag

source.tutsplus.com/webdesign/tutor...

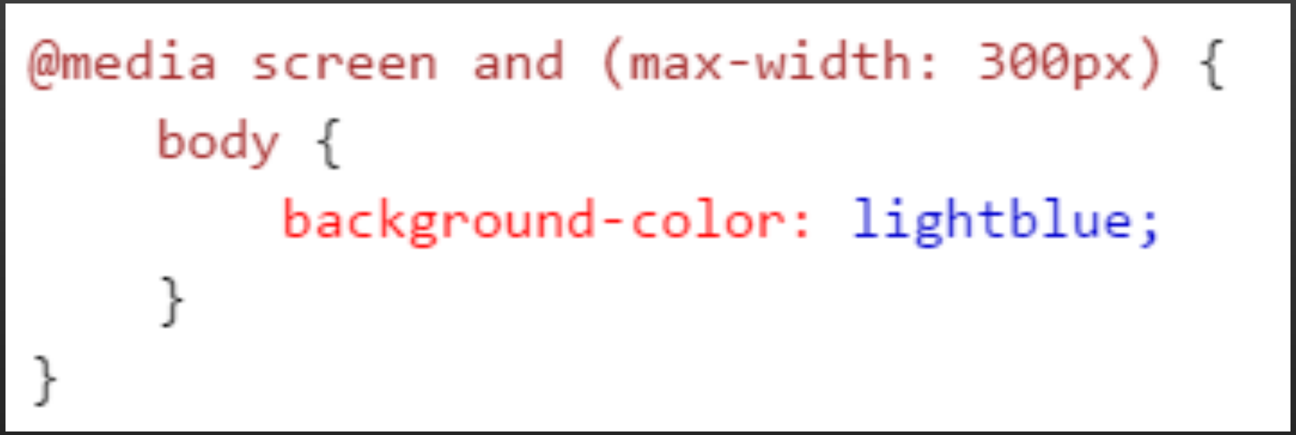
Most Perso
the Increas

"Granser," he an
with your gabble
Red Death? If yo

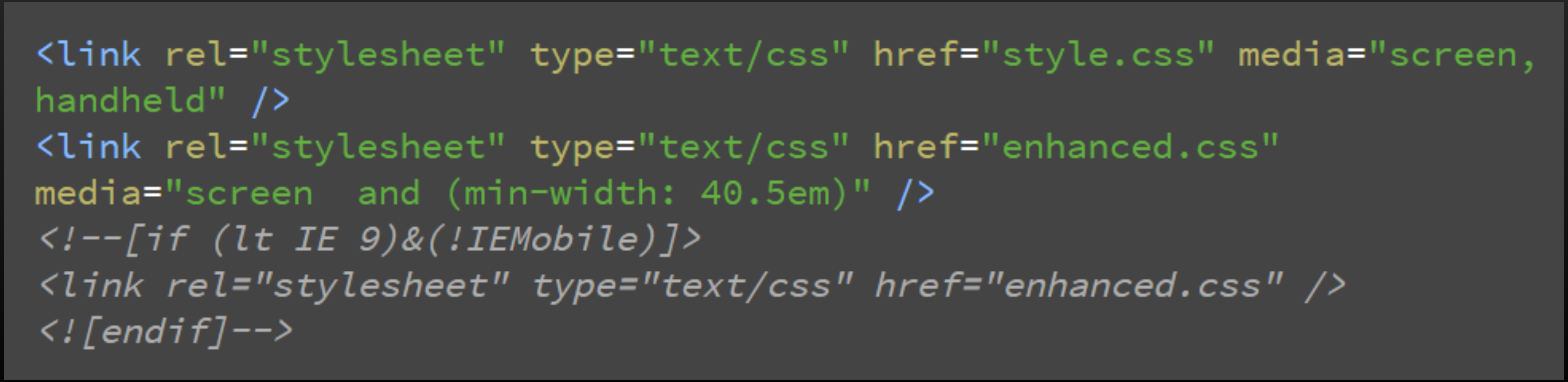
Recommendation:
width=device-width
and field test

http://webdesign.tutsplus.com/articles/quick-tip-dont-forget-the-viewport-meta-tag--webdesign-5972

CSS @media queries



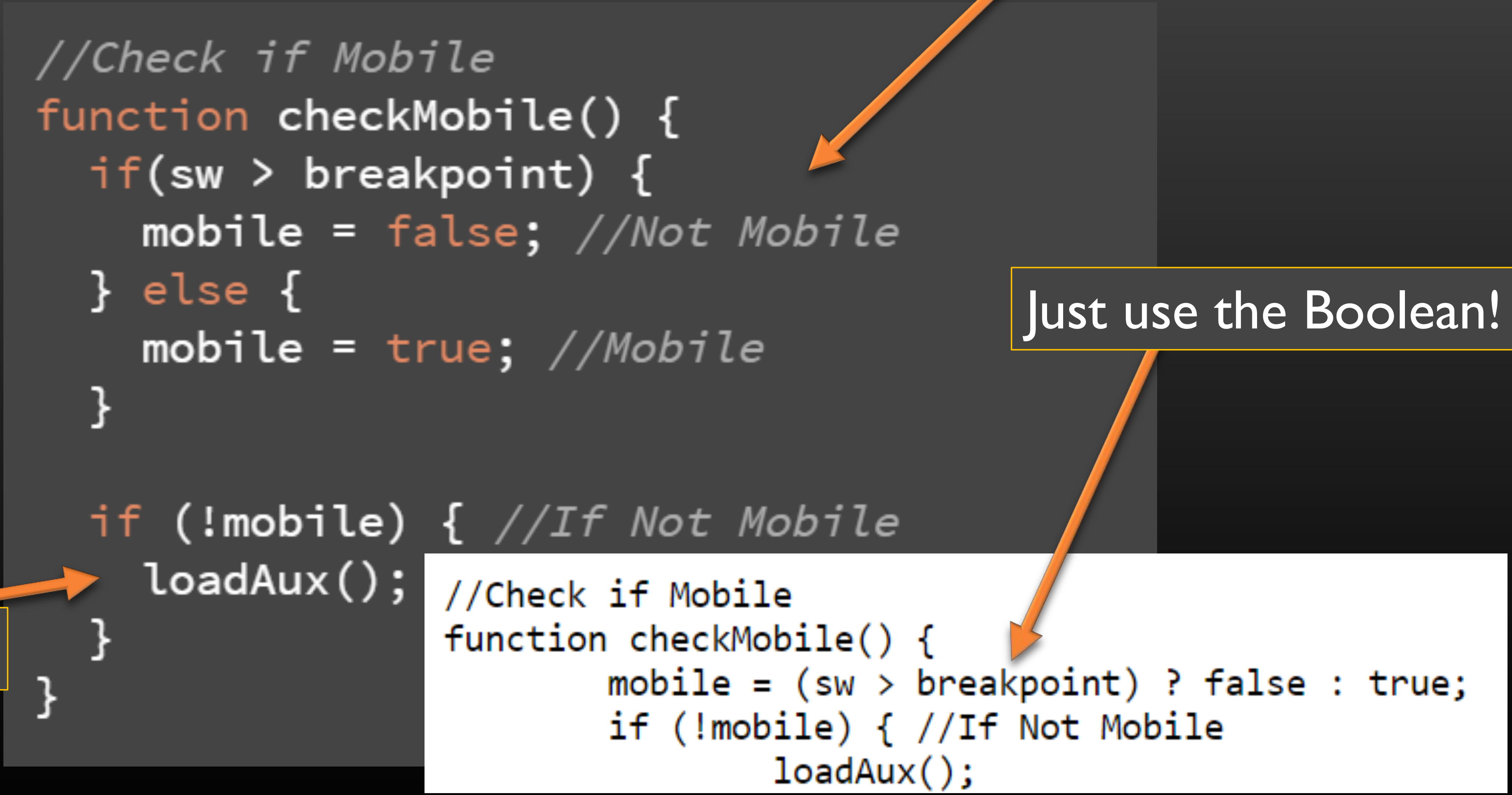
```css
@media screen and (max-width: 300px) {
    body {
        background-color: lightblue;
    }
}
```



```html
<link rel="stylesheet" type="text/css" href="style.css" media="screen,
handheld" />
<link rel="stylesheet" type="text/css" href="enhanced.css"
media="screen  and (min-width: 40.5em)" />
<!--[if (lt IE 9)&(!IEMobile)]>
<link rel="stylesheet" type="text/css" href="enhanced.css" />
<![endif]-->
```

http://www.html5rocks.com/en/mobile/responsivedesign/

… bad code is everywhere



```
//Check if Mobile
function checkMobile() {
  if(sw > breakpoint) {
    mobile = false; //Not Mobile
  } else {
    mobile = true; //Mobile
  }

  if (!mobile) { //If Not Mobile
    loadAux();
  }
}
```

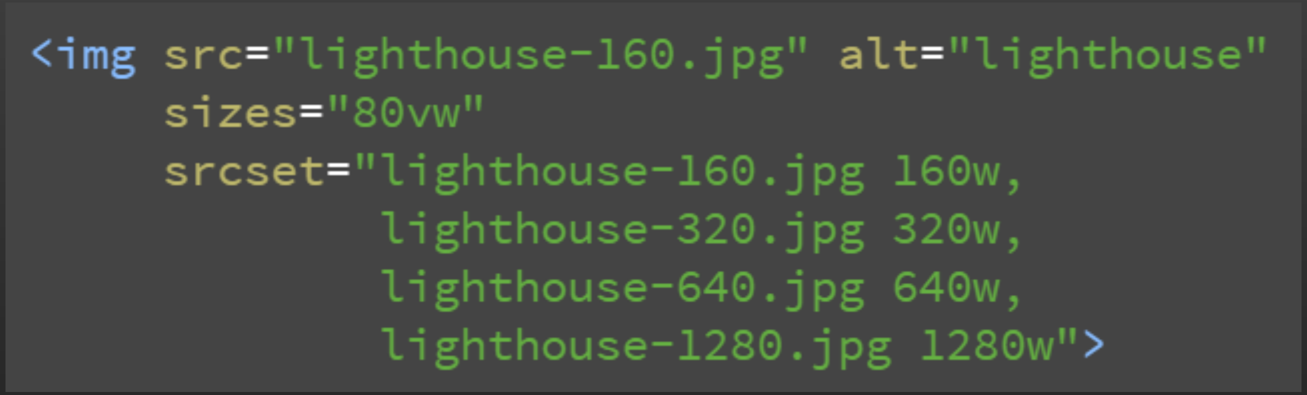
```
//Check if Mobile
function checkMobile() {
        mobile = (sw > breakpoint) ? false : true;
        if (!mobile) { //If Not Mobile
                loadAux();
```

useless comments

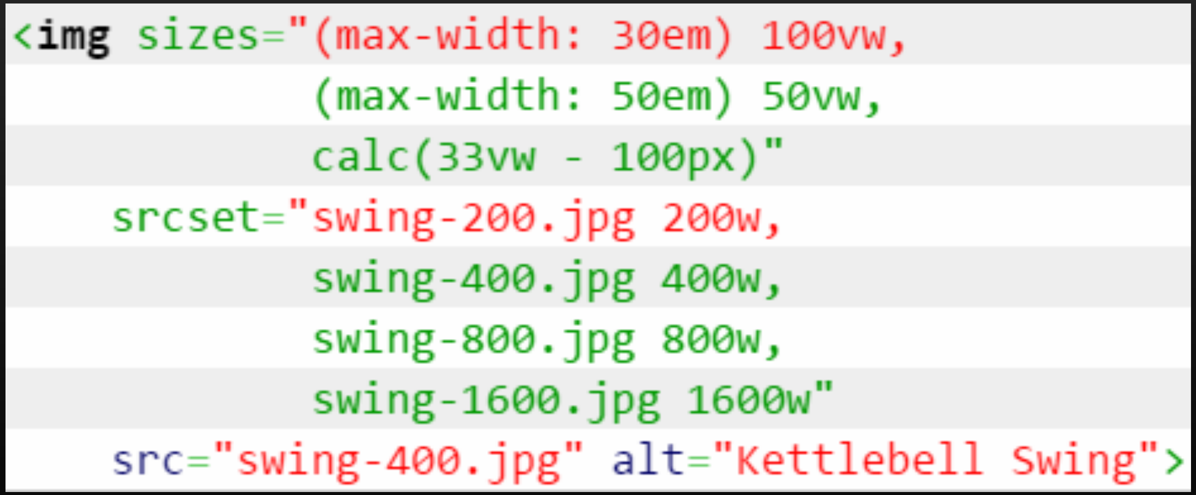
Just use the Boolean!

Not descriptive

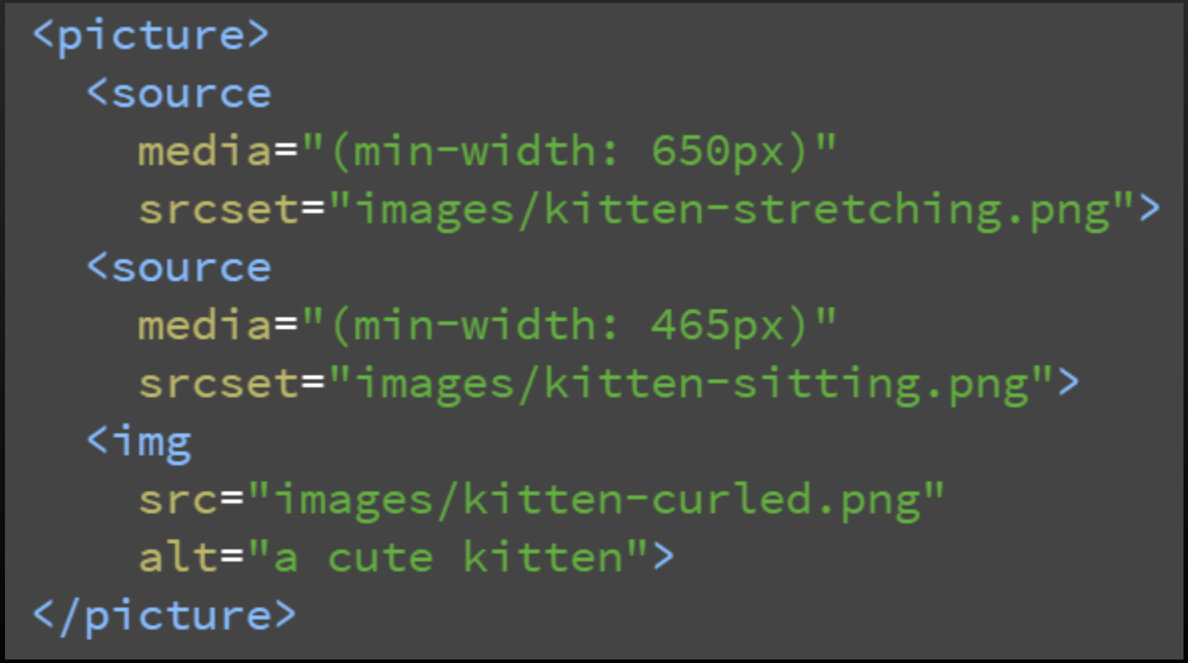
Better Responsive Images



```
<img src="lighthouse-160.jpg" alt="lighthouse"
     sizes="80vw"
     srcset="lighthouse-160.jpg 160w,
             lighthouse-320.jpg 320w,
             lighthouse-640.jpg 640w,
             lighthouse-1280.jpg 1280w">
```



```
<img sizes="(max-width: 30em) 100vw,
            (max-width: 50em) 50vw,
            calc(33vw - 100px)"
    srcset="swing-200.jpg 200w,
            swing-400.jpg 400w,
            swing-800.jpg 800w,
            swing-1600.jpg 1600w"
    src="swing-400.jpg" alt="Kettlebell Swing">
```

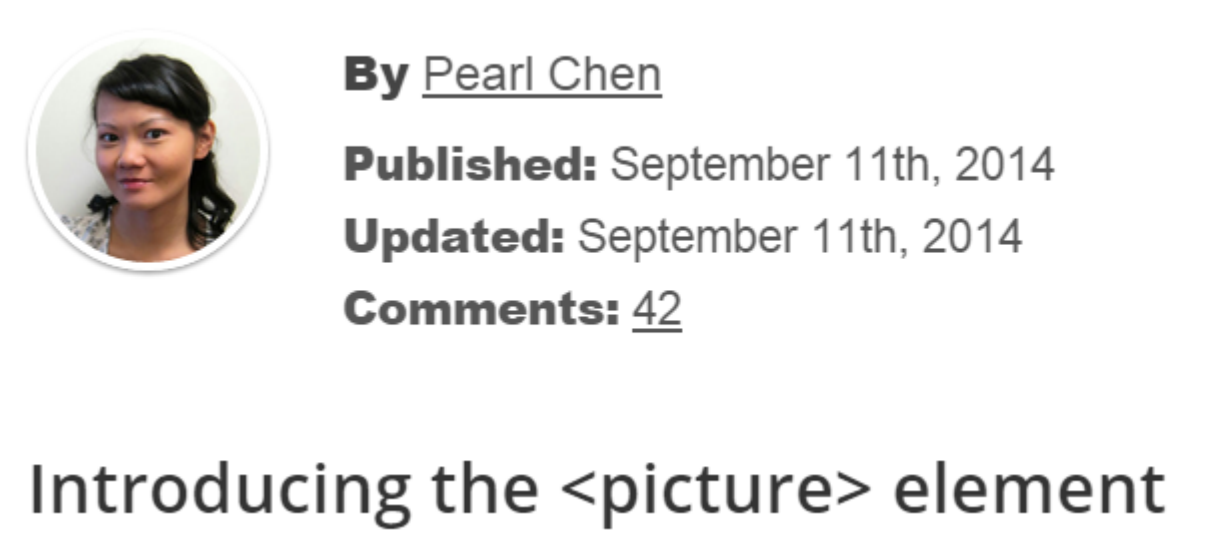


```
<picture>
  <source
    media="(min-width: 650px)"
    srcset="images/kitten-stretching.png">
  <source
    media="(min-width: 465px)"
    srcset="images/kitten-sitting.png">
  <img
    src="images/kitten-curled.png"
    alt="a cute kitten">
</picture>
```

http://www.html5rocks.com/en/tutorials/responsive/picture-element/

http://blog.cloudfour.com/dont-use-picture-most-of-the-time/

Better Responsive Images



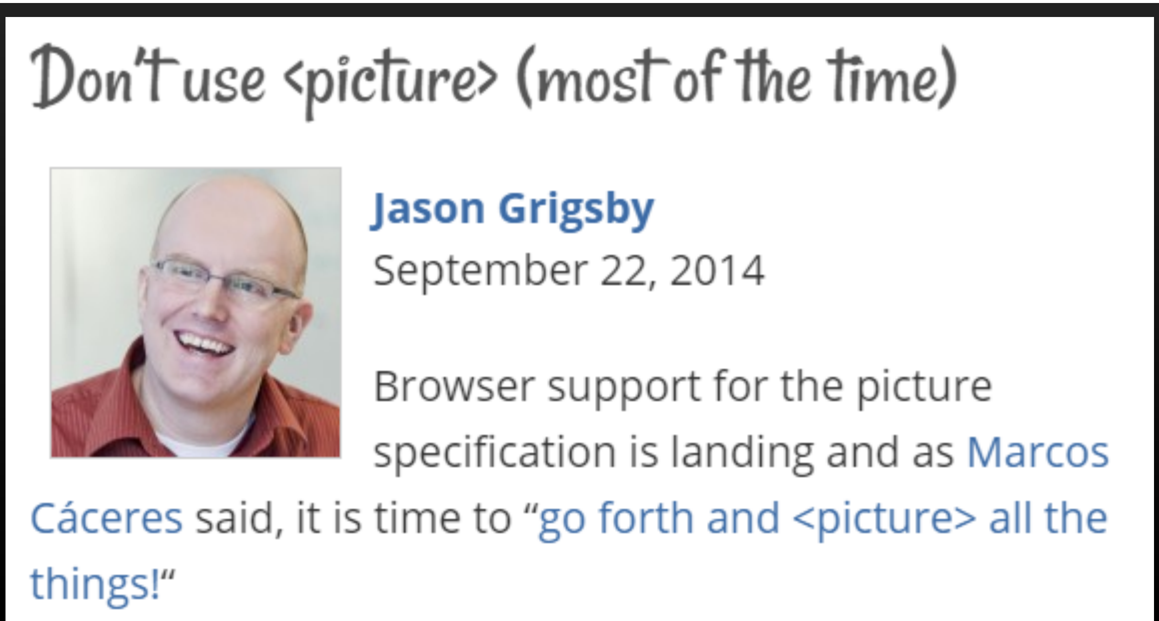
By Pearl Chen

Published: September 11th, 2014

Updated: September 11th, 2014

Comments: 42

Introducing the <picture> element



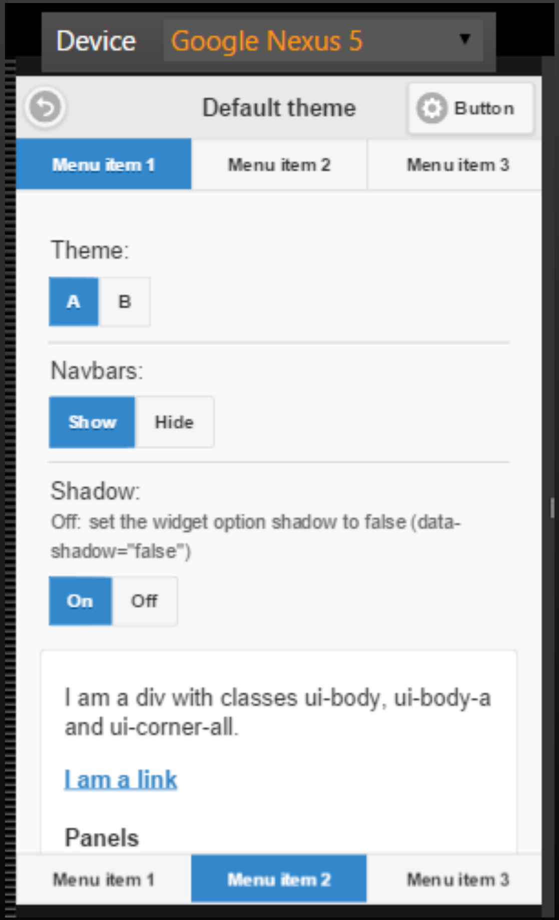
Don't use <picture> (most of the time)

Jason Grigsby

September 22, 2014

Browser support for the picture specification is landing and as Marcos Cáceres said, it is time to “go forth and <picture> all the things!“

Mobile First with jQuery Mobile



Device: Google Nexus 5

Default theme

Theme: A | B

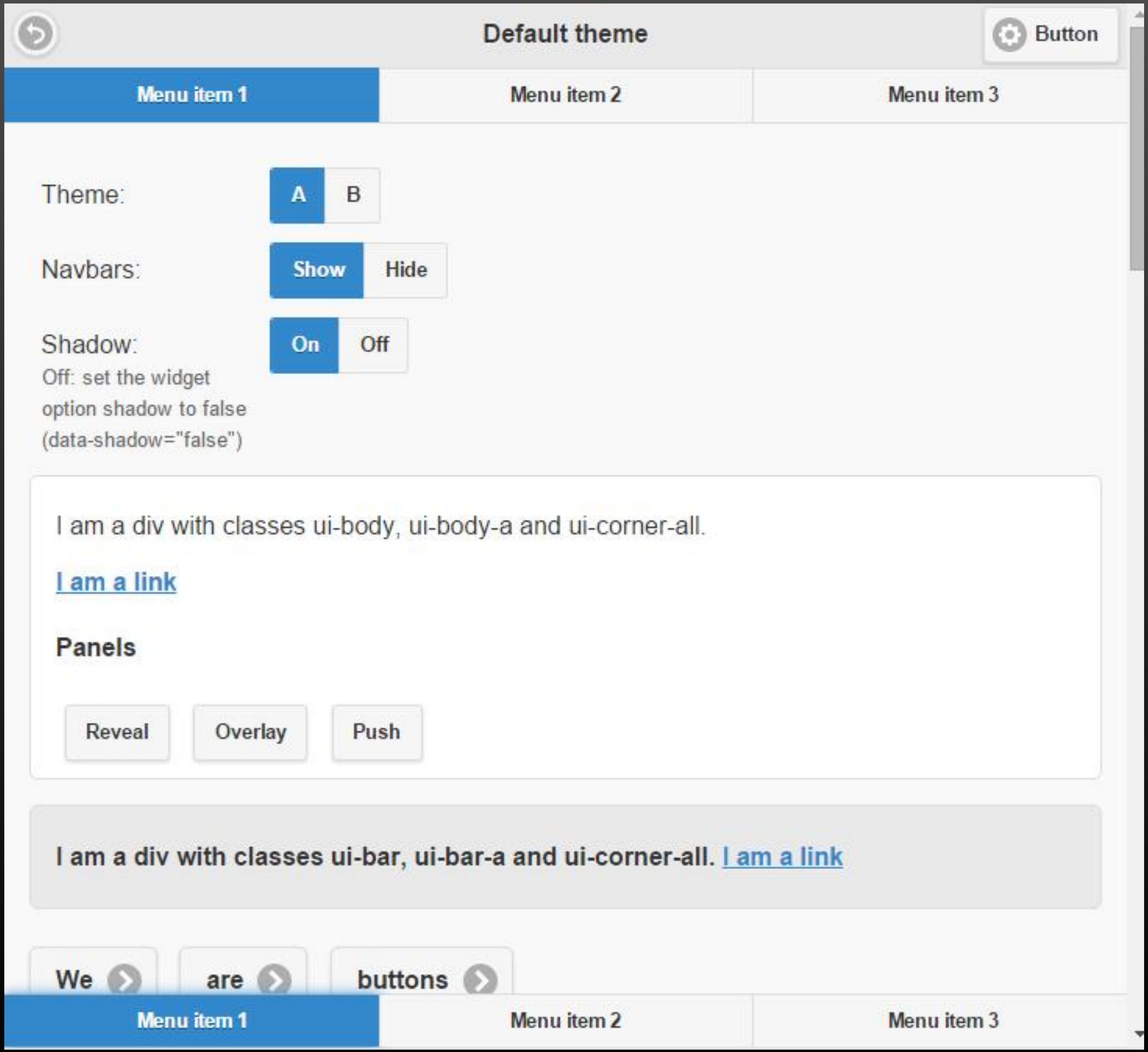
Navbars: Show | Hide

Shadow:
Off: set the widget option shadow to false (data-shadow="false")
On | Off

I am a div with classes ui-body, ui-body-a and ui-corner-all.

I am a link

Panels



Default theme

Theme: A | B

Navbars: Show | Hide

Shadow:
Off: set the widget option shadow to false (data-shadow="false")
On | Off

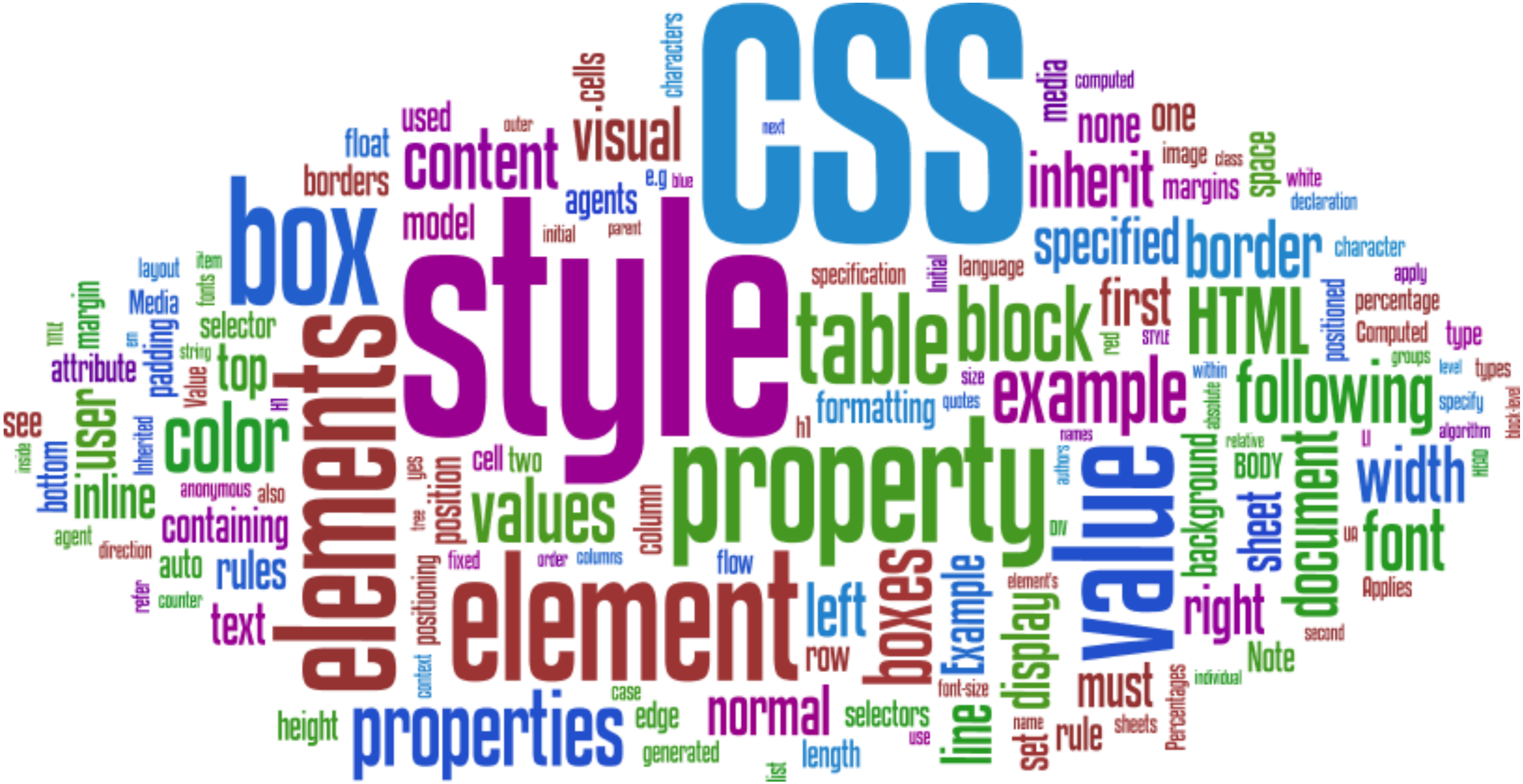
I am a div with classes ui-body, ui-body-a and ui-corner-all.

I am a link

Panels

I am a div with classes ui-bar, ui-bar-a and ui-corner-all. I am a link

https://jquerymobile.com/


CSS
style
property
element
elements
value
box
table
block
example
following
properties
content
visual
inherit
specified
border
HTML
first
color
values
boxes
document
font
width
normal
display
must
right
left
line
Example
sheet
background
rule
set
row
length
selectors
edge
generated
height
text
rules
auto
containing
inline
user
top
selector
padding
attribute
margin
Media
layout
item
fonts
borders
float
used
outer
model
initial
parent
agents
e.g
blue
next
cells
characters
media
computed
none
one
image
class
margins
space
white
declaration
character
apply
percentage
Computed
type
types
positioned
groups
level
specify
algorithm
block-level
HIDDEN
UA
Applies
second
Note
individual
Percentages
sheets
name
font-size
use
list
names
authors
DIV
element's
relative
absolute
within
BODY
UI
red
STYLE
size
quotes
formatting
h1
language
Initial
specification
flow
column
columns
order
fixed
positioning
position
cell
two
yes
tree
context
case
also
anonymous
Inherited
H1
Value
string
em
TITLE
see
bottom
inside
agent
direction
refer
counter

References

- w3schools
- CSS Zen garden
- CSS-tricks (Chris Coyler)