

# Web Programming

## CSS Part I.



# Using styles

- Most important benefit:  
imposing consistency

```
<head>  
<style>  
  p {color:red;}  
</style>  
</head>
```

**{css}**

# CSS

- Cascading Style Sheets
- Describe the appearance of HTML documents
- Main advantages
  - Separate content from presentation
  - Consistency
  - Easier website maintenance
- Main disadvantage
  - Browser support – cross-browser testing is a must!

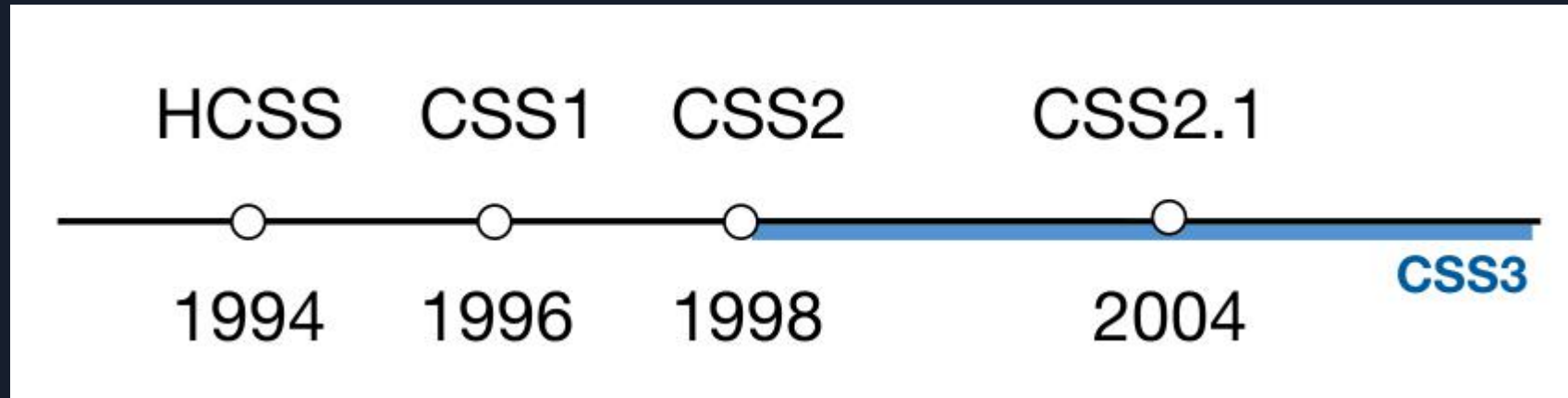
# Form

- In between <form> and </form>
- action is the address where the form is sent
- required attribute, but can be set empty

```
<form action="">
```

```
</form>
```

# CSS development



- Currently: CSS3
- Specification is maintained by W3C
- Most properties have already been implemented in modern browsers

# CSS levels

- Three levels
- Inline
- Document level
- External
- Levels also reflect priorities

# Inline

- Using the style attribute
- can be used with almost all tags
- exceptions: <html>, <head>, <title>, <meta>, <param>, <style>, <script>
- property:value pairs separated with ;
- overrides any style set globally

## HTML

```
<p style="color:green;font-size:16px;" >Large green text</p>
```

Large green text

# CSS syntax (document-level and external)



- Selectors indicate which element(s) the rule applies to
- Declarations describe the styling
- List of property: value pairs separated by a semicolon



# Document level

- Defined in the <head> of the HTML document

## HTML

```
<head>
[...]  
<style>  
  p {  
    color: blue;  
    text-align: right;  
  }  
</style>  
</head>
```

# External

- In a separate CSS file, linked from the HTML

## HTML

```
<head>  
  <link rel="stylesheet" href="style.css" />  
</head>
```

## CSS FILE

```
p {  
  color: blue;  
  text-align: right;  
}  
/* you can comment, too */
```

# Advantages of having external CSS file(s)

- Separate content and structure from presentation
- Reduce repetition (remember: DRY)
- Enable multiple pages to share the same design
- Maintain site-wide consistency
  - Changes are to made in a single place
- Reduce bandwidth
  - CSS file is accessed only once, size of HTML files is reduced

# Outline

- Part I - Properties

- To customize the styling of elements

- Part II - Selectors

- To select which elements to apply a style to

- Part III - Positioning

- To set the alignment of elements and layout of a page

# Today

- We only use document level and inline css
  - So that both HTML and CSS is in a single file
  - Normally, you should always use an external CSS file
- Use a text editor or the w3school try-it editor

# Part I.

# Properties

# Properties

- Among other things...
- Fonts
- Lists
- Text alignment
- Margins
- Colors
- Backgrounds
- Borders

# Text

- Font
- Family, size, weight, style, stretch, spacing, ...
- Alignment
- Color
- Decoration
- Underline, strike-through, ...



# Font families

## SERIF

Extra details on the ends of the main strokes of the letters. These details are known as serifs.

im

In print, traditionally used for long passages of text because they are considered easier to read.

## SANS-SERIF

Straight ends to letters, therefore have a much cleaner design.

im

Screens have a lower resolution than print. If the text is small, sans-serif fonts can be clearer to read.

## MONOSPACE

Every letter in a monospace (or fixed-width) font is the same width.

im

Monospace fonts are commonly used for code because they align nicely, making the text easier to follow.

# Examples

## SERIF

Times New Roman

Georgia

## SANS-SERIF

Arial

Verdana

Helvetica

## MONOSPACE

Courier

Courier New

Lucida console

# Setting font family

- Property: font-family
- Value: name(s) of the font(s)
- Alternatives can be defined
- In case the given font is not present on the user's computer, the next in the sequence will be used
- Put the general font family as last in the list

## CSS FILE

```
h1 {  
    font-family: "Helvetica Neue", Helvetica, Arial, sans-serif;  
}
```

First choice

Fall-back choice

# Importing fonts



- Add at beginning of style file `@import url(address);`
- Alternative: use `@font-face`
- See [http://www.w3schools.com/css/css3\\_fonts.asp](http://www.w3schools.com/css/css3_fonts.asp)
- Great font resource: <https://www.google.com/fonts>


## CSS FILE

```
@import url(https://fonts.googleapis.com/css?family=Roboto);  
h2 {  
    font-family: "Roboto", sans-serif;  
}
```


# Importing fonts


<https://fonts.google.com/selection/embed>

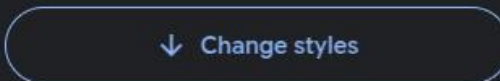


Inter Variable ⓘ 

Whereas recognition of the

 Reset all

Optical Size ⓘ 



3 styles

Italic: 0

Optical Size: Auto


Weight: 100 – 900

Web Android iOS Flutter

☒ <link> ☐ @import

Embed code in the <head> of your html


```
<link rel="preconnect" href="https://fonts.googleapis.com">
<link rel="preconnect" href="https://fonts.gstatic.com" crossorigin>
<link href="https://fonts.googleapis.com/css2?family=Inter:ital,opsz,wght@0,14..32,100..900;1,14..32,100..900&
display=swap" rel="stylesheet">
```

 Copy code

Inter: CSS class for a variable style

```
// <weight>: Use a value from 100 to 900
// <uniquifier>: Use a unique and descriptive class name

.inter-<uniquifier> {
  font-family: "Inter", serif;
  font-optical-sizing: auto;
  font-weight: <weight>;
  font-style: normal;
}
```

 Copy code

# Importing fonts @import

<https://fonts.google.com/selection/embed>

Web

Android

iOS

Flutter

☐ <link> ☒ @import

Embed code in the <head> of your html

```
<style>
@import url('https://fonts.googleapis.com/css2?family=Inter:ital,opsz,wght@0,14..32,100..900;1,14..32,100..900
&display=swap');
</style>
```

Copy code

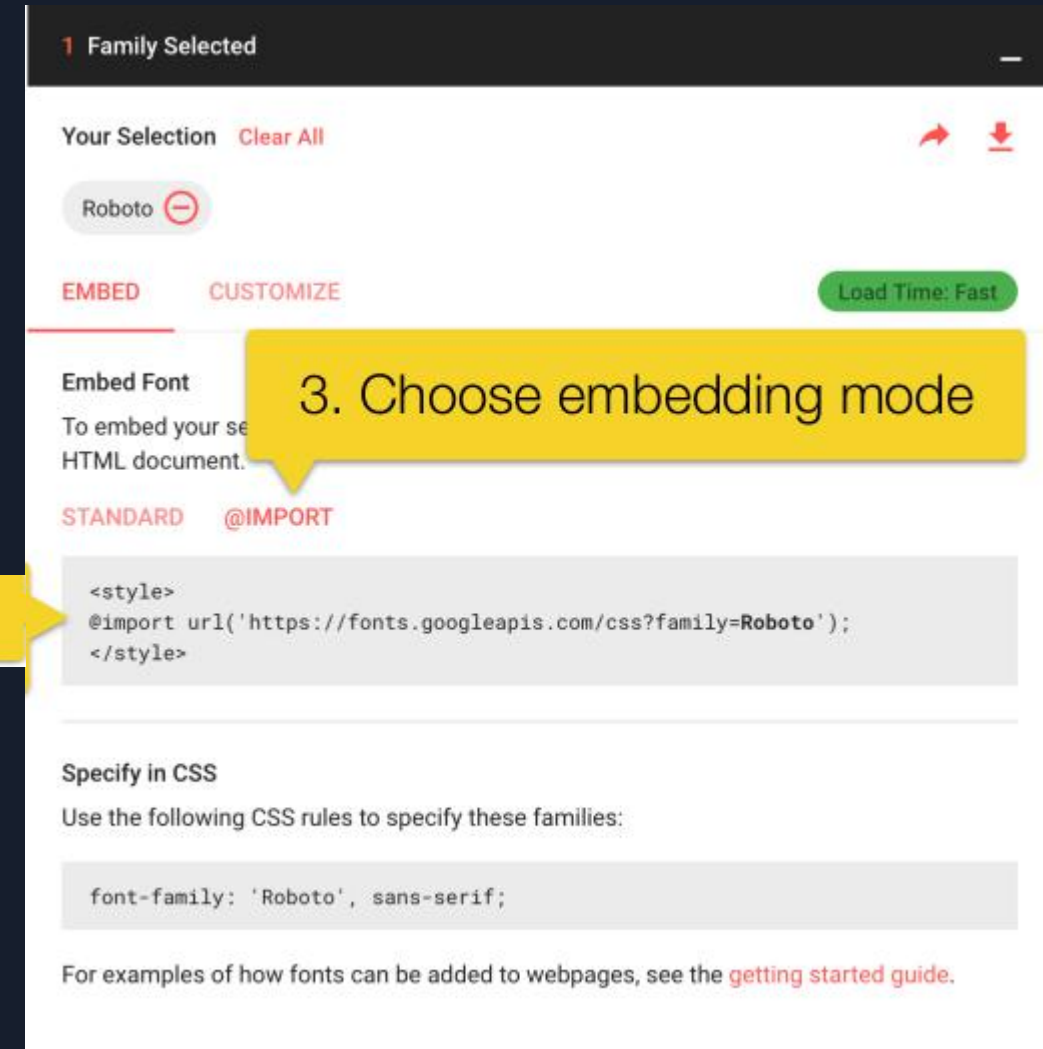
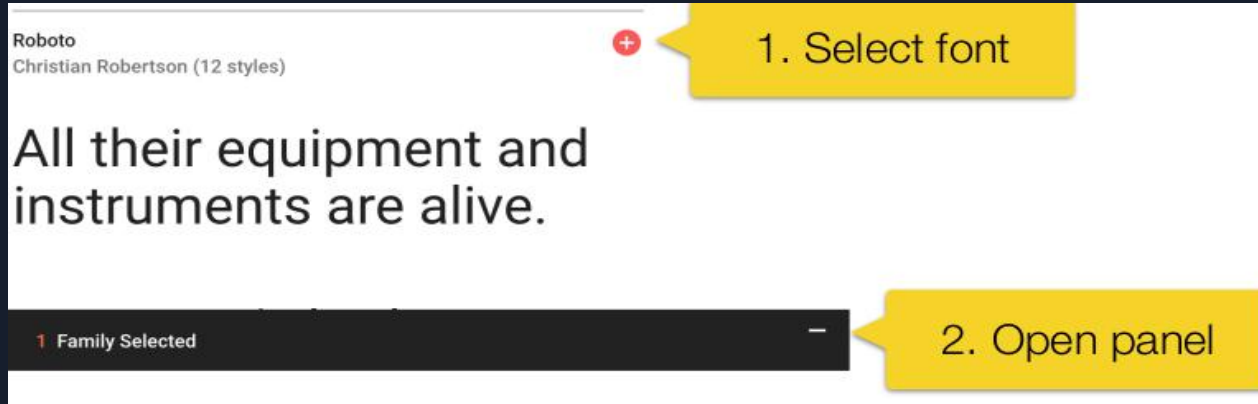
Inter: CSS class for a variable style

```
// <weight>: Use a value from 100 to 900
// <uniquifier>: Use a unique and descriptive class name

.inter-<uniquifier> {
  font-family: "Inter", serif;
  font-optical-sizing: auto;
  font-weight: <weight>;
  font-style: normal;
}
```

Copy code

# How to use Google Fonts



4. Copy-paste code into CSS

# Font size

- Property: font-size
- Value: size in one of these units
- Absolute
- cm, mm, in
- px pixels
- pt points
- Relative
- **em** relative to the current font size (**recommended**), (rem)
- % percentage
- Keywords
- xx-small, x-small, small, medium, large, x-large, xx-large
- [https://www.w3schools.com/cssref/css\\_units.asp](https://www.w3schools.com/cssref/css_units.asp)

## CSS FILE

```
h1 {  
    font-size: 2em;  
}  
h2 {  
    font-size: 16pt;  
}  
h3 {  
    font-size: medium;  
}
```



# Example

## CSS FILE

```
@import url(https://fonts.googleapis.com/css?family=Roboto);  
h1 {  
  font-family: "Helvetica Neue", Helvetica, Arial, sans-serif;  
  font-size: 2em;  
}  
h2 {  
  font-family: "Roboto", sans-serif;  
  font-size: 12pt;  
}
```

## Potatoes

There are dozens of different potato varieties. They are usually described as early, second early and maincrop potatoes.

# Weight, style, stretch

## WEIGHT

Light  
Medium  
**Bold**  
**Black**

The font weight not only adds emphasis but can also affect the amount of white space and contrast on a page.

## STYLE

Normal  
*Italic*  
*Oblique*

Italic fonts have a cursive aspect to some of the lettering. Oblique font styles take the normal style and put it on an angle.

## STRETCH

**Condensed**  
**Regular**  
**Extended**

In condensed (or narrow) versions of the font, letters are thinner and closer together. In expanded versions they are thicker and further apart.

# Weight, style, stretch

- Weight
- Property: font-weight
- Values: normal, bold, ...
- [http://www.w3schools.com/cssref/pr\\_font\\_weight.asp](http://www.w3schools.com/cssref/pr_font_weight.asp)
- When using non-default font weight, consider importing font with specific weight.

## CSS FILE

```
@import url(https://fonts.googleapis.com/css?family=Roboto:500);
```

```
body {  
  font-family: "Roboto", sans-serif;  
  font-weight: 500;  
}
```

1. Import specific weight

2. Change for complete body

# Weight, style, stretch (2)

## - Style

- Property: font-style
- Values: normal, italic, oblique
- [http://www.w3schools.com/cssref/pr\\_font\\_font-style.asp](http://www.w3schools.com/cssref/pr_font_font-style.asp)

## - Stretch

- Property: font-stretch
- Values: normal, condensed, expanded, ...
- [http://www.w3schools.com/cssref/css3\\_pr\\_font-stretch.asp](http://www.w3schools.com/cssref/css3_pr_font-stretch.asp)

# Spacing

- Letter spacing

- Property: **letter-spacing**
- Value: length of extra space (px, cm, em, etc); negative values are allowed
- [http://www.w3schools.com/cssref/pr\\_text\\_letter-spacing.asp](http://www.w3schools.com/cssref/pr_text_letter-spacing.asp)

- Word spacing

- Property: **word-spacing**
- Value: length of extra space (px, cm, etc); negative values are allowed
- [http://www.w3schools.com/cssref/pr\\_text\\_word-spacing.asp](http://www.w3schools.com/cssref/pr_text_word-spacing.asp)

# Text alignment

- Property: `text-align`
- Values: `center`, `left`, `right`, `justify`
- [http://www.w3schools.com/cssref/pr\\_text\\_text-align.asp](http://www.w3schools.com/cssref/pr_text_text-align.asp)

## HTML

```
<p style="text-align: right;">Right aligned text</p>
```

Right aligned text

# Color

- Property: color
- Value: color given as
  - A HEX value, e.g., #ff0000
  - An rgb value, e.g., rgb(255,0,0)
  - A color name, e.g., red

## HTML

```
<p style="color: #ff0000;" >Red text</p>
```

Red text

# Decoration

- Property: text-decoration
- Values: none, underline, overline, line-through
- [http://www.w3schools.com/cssref/pr\\_text\\_text-decoration.asp](http://www.w3schools.com/cssref/pr_text_text-decoration.asp)

## HTML

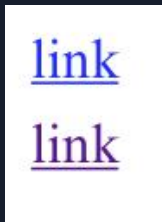
```
<p>Lorem ipsum dolor sit amet, consectetur adipiscing elit. Cras a  
    <span style="text-decoration: line-through;"> maximus </span>  
diam.</p>
```

Lorem ipsum dolor sit amet, consectetur adipiscing elit.  
Cras a ~~maximus~~ diam.



# Links

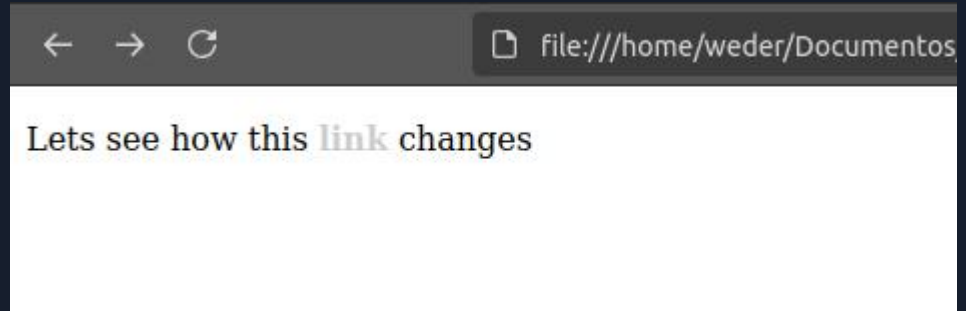
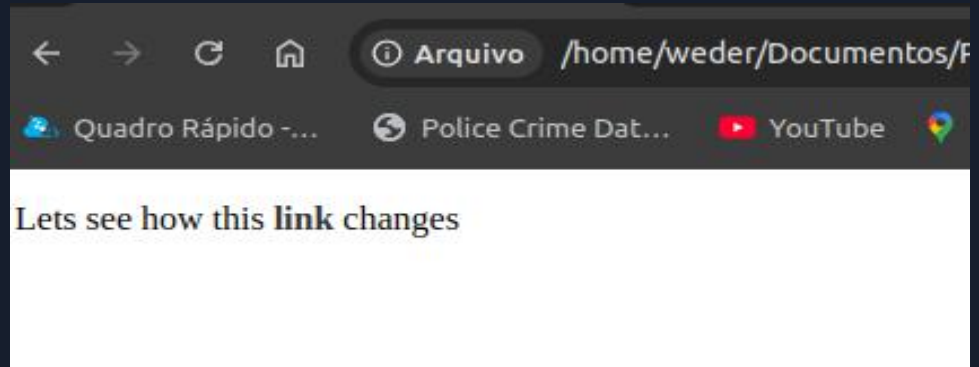
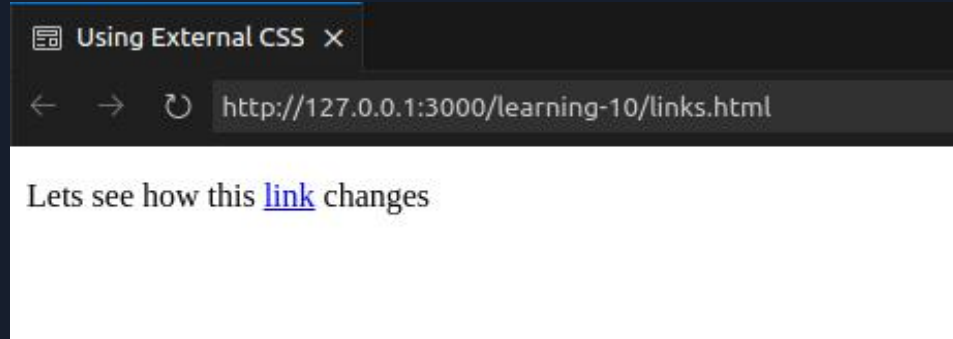
- Links can be styled with any CSS property
- In addition, they can be styled differently based on their state
  - `a:link` a normal, unvisited link
  - `a:visited` a link the user has visited
  - `a:hover` a link when the user mouses over it
  - `a:active` a link the moment it is clicked
- Default behavior:
  - normal: blue, underlined
  - visited: purple, underlined



# Example

## CSS FILE

```
<style>
a {
  color: #333333;
  font-weight: bold;
  text-decoration: none;
}
a:hover {
  text-decoration: underline;
}
a:visited {
  color: #cccccc;
}
</style>
```



# Colors and Backgrounds

# Color

## CSS FILE

```
/* color name */
h1 {
  color: DarkCyan;
}
/* hex code */
h2 {
  color: #ee3e80;
}
/* rgb value */
p {
  color: rgb(100,100,90);
}
```

# Background color

## CSS FILE

```
body {  
  background-color: rgb(200,200,200);  
}  
h1 {  
  background-color: DarkCyan;  
}  
p {  
  background-color: #ee3e80;  
}
```

# Color values

- by name (blue)
- hex RGB code (#0000FF)
- see color names

<http://www.w3.org/TR/css3-color/#svg-color>

Named	Numeric	Color name	Hex rgb	Decimal
		<i>aliceblue</i>	#F0F8FF	240,248,255
		<i>antiquewhite</i>	#FAEBD7	250,235,215
		<i>aqua</i>	#00FFFF	0,255,255
		<i>aquamarine</i>	#7FFFD4	127,255,212
		<i>azure</i>	#F0FFFF	240,255,255
		<i>beige</i>	#F5F5DC	245,245,220
		<i>bisque</i>	#FFE4C4	255,228,196
		<i>black</i>	#000000	0,0,0
		<i>blanchedalmond</i>	#FFEBCD	255,235,205
		<i>blue</i>	#0000FF	0,0,255
		<i>blueviolet</i>	#8A2BE2	138,43,226
		<i>brown</i>	#A52A2A	165,42,42
		<i>burlywood</i>	#DEB887	222,184,135
		<i>cadetblue</i>	#5F9EA0	95,158,160
		<i>chartreuse</i>	#7FFF00	127,255,0
		<i>chocolate</i>	#D2691E	210,105,30
		<i>coral</i>	#FF7F50	255,127,80
		<i>cornflowerblue</i>	#6495ED	100,149,237
		<i>cornsilk</i>	#FFF8DC	255,248,220
		<i>crimson</i>	#DC143C	220,20,60
		<i>cyan</i>	#00FFFF	0,255,255
		<i>darkblue</i>	#00008B	0,0,139
		<i>darkcyan</i>	#008B8B	0,139,139
		<i>darkgoldenrod</i>	#B8860B	184,134,11
		<i>darkgray</i>	#A9A9A9	169,169,169
		<i>darkgreen</i>	#006400	0,100,0
		<i>darkgrey</i>	#A9A9A9	169,169,169
		<i>darkkhaki</i>	#BDB76B	189,183,107
		<i>darkmagenta</i>	#8B008B	139,0,139
		<i>darkolivegreen</i>	#556B2F	85,107,47

# CSS3 colors: RGBA

- RGBA allows us to set opacity
- alpha value between 0.0 and 1.0

## CSS FILE

```
.one {  
  background-color: rgb(0,0,0);  
  opacity: 0.5;  
}  
.two {  
  background-color: rgba(0,0,0,0.5);  
}
```



result



result in older browsers

# CSS3 colors: HSL/HSLa

- Specify colors using Hue, Saturation, and Lightness (and alpha)



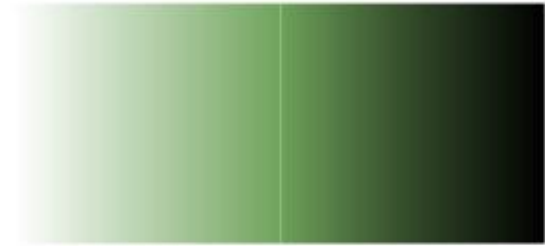
## HUE

angle represents the color



## Saturation

amount of grey (in %)



## Lightness

white (100%) vs. black (0%)



# CSS3 colors: HSL/HSLa

- HSLa allows us to set opacity
- alpha value between 0.0 and 1.0

## CSS FILE

```
body {  
  background-color: hsl(0,0%,78%);  
}  
p {  
  background-color: hsla(0,100%,100%,0.5);  
}
```

# Page background color

- Set the background-color property of the body tag

## HTML

```
<body style="background-color: #0033cc;">
```

Introducing CSS ×

← → ↺ http://127.0.0.1:3000/learning-10/bodybg.html

## From Garden to Plate

A *potager* is a French term for an ornamental vegetable or kitchen garden. Often flowers (edible and non-edible) and herbs are planted with the vegetables to enhance the garden's beauty. The goal is to make the function of providing food aesthetically pleasing.

### What to Plant

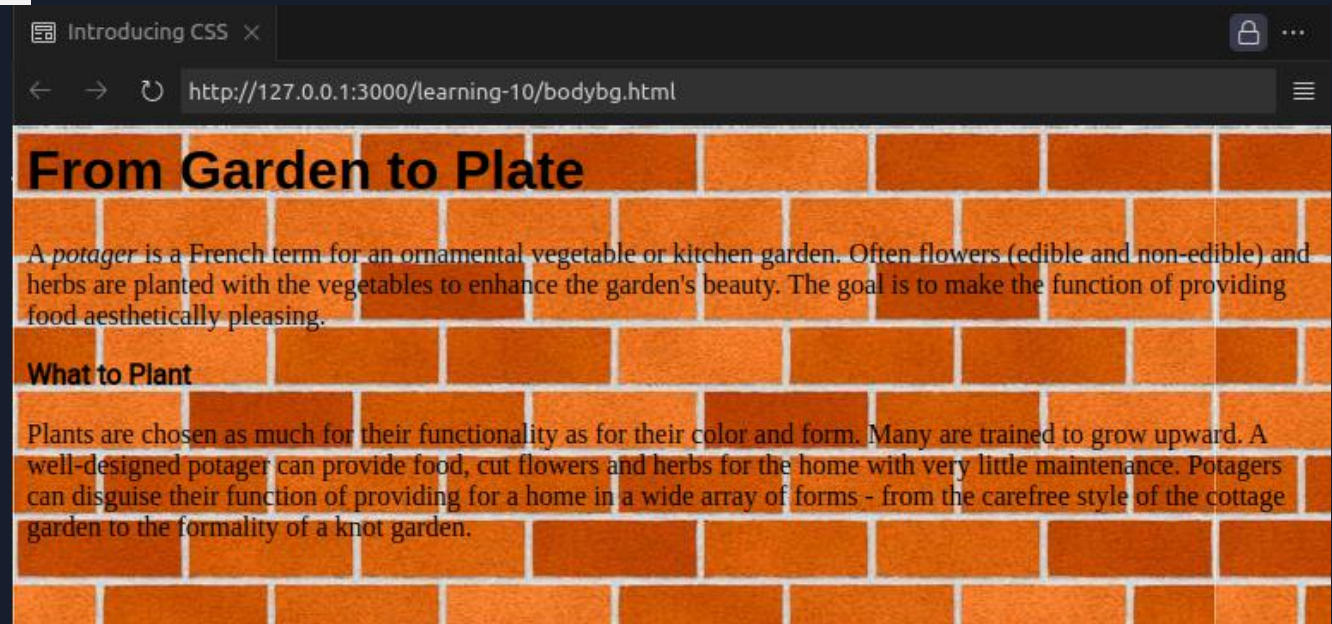
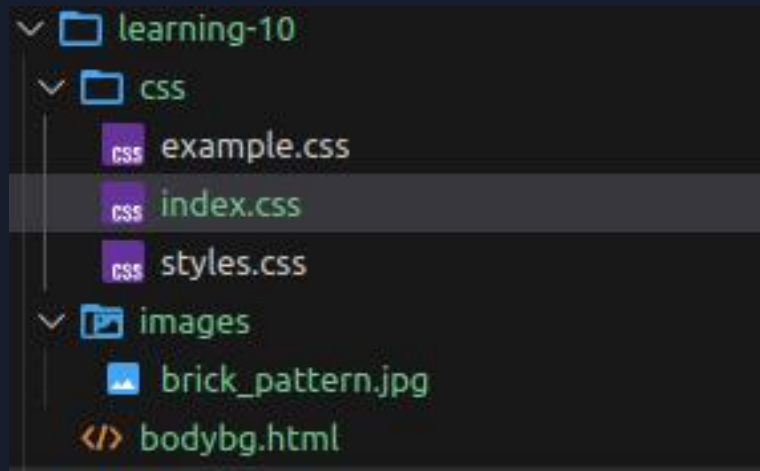
Plants are chosen as much for their functionality as for their color and form. Many are trained to grow upward. A well-designed potager can provide food, cut flowers and herbs for the home with very little maintenance. Potagers can disguise their function of providing for a home in a wide array of forms - from the carefree style of the cottage garden to the formality of a knot garden.

# Background image

- Property: background-image
- See also background-repeat
- [http://www.w3schools.com/cssref/pr\\_background-repeat.asp](http://www.w3schools.com/cssref/pr_background-repeat.asp)

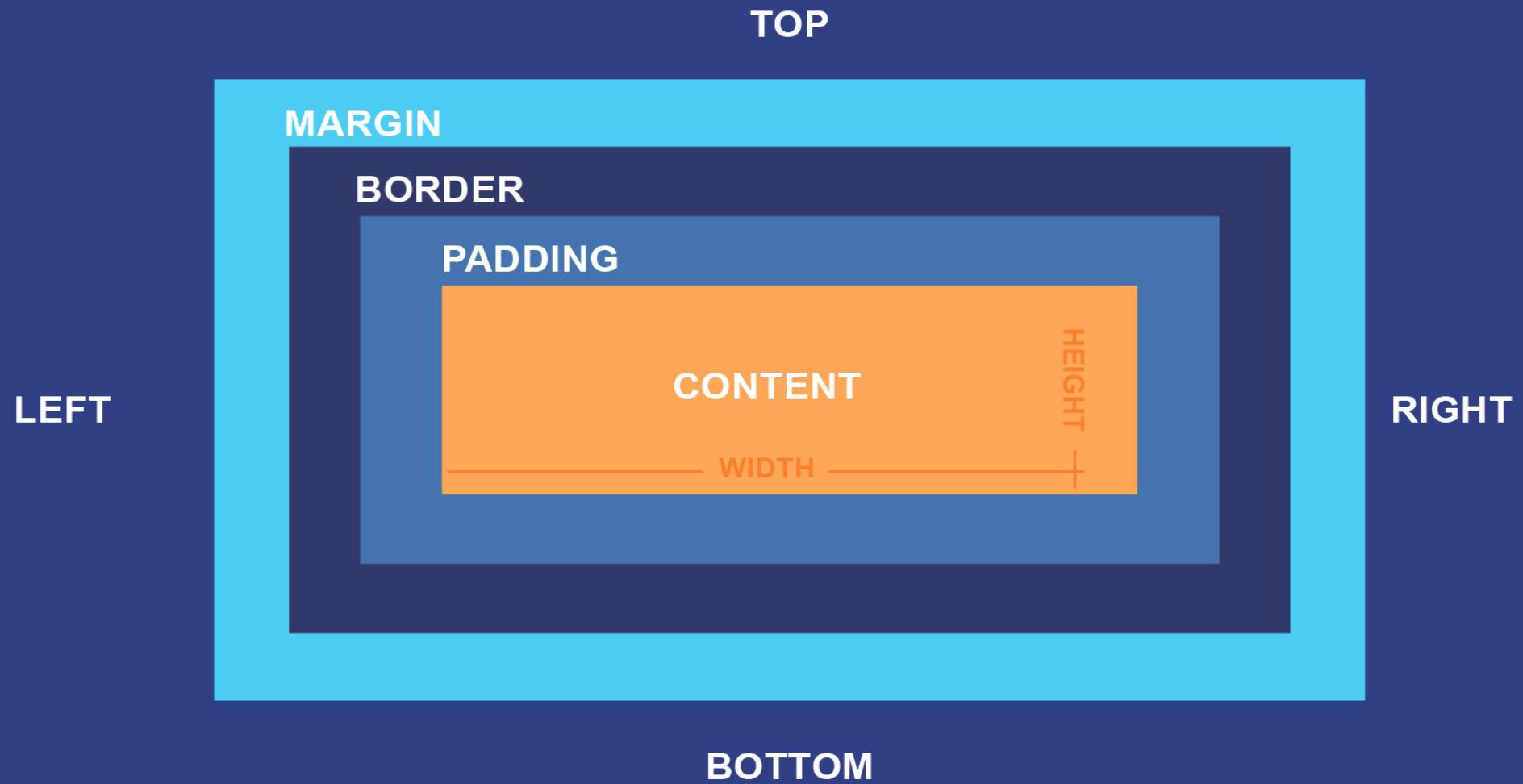
## CSS FILE(index.css)

```
body {  
  background-image: url("../images/brick_pattern.jpg");  
}
```



# Boxes

# The Box Model



# What margin and padding values were used here?

margin: 0px;  
padding: 0px;

**Newsitem #1**

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Sed vestibulum non orci quis porta. Integer ac malesuada mauris, ut gravida metus. Pellentesque habitant morbi tristique senectus et netus et malesuada fames ac turpis egestas.

**Newsitem #2**

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Sed vestibulum non orci quis porta. Integer ac malesuada mauris, ut gravida metus. Pellentesque habitant morbi tristique senectus et netus

margin: 0px;  
padding: 10px;

**Newsitem #1**

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**Newsitem #2**

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margin: 10px;  
padding: 0px;

**Newsitem #1**

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margin: 10px;  
padding: 10px;

**Newsitem #1**

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**Newsitem #2**

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# Border width

- border-width
  - in pixels (1px)
  - or thin, medium, thick
- Possible to set values for each side
  - border-top-width, border-right-width, border-bottom-width, border-left-width
- Shorthand
  - border-width: 2px 1px 1px 2px;
  - clockwise order: top, right, bottom, left

# Border style

- border-style

solid

dotted

dashed

double

groove

ridge

inset

outset

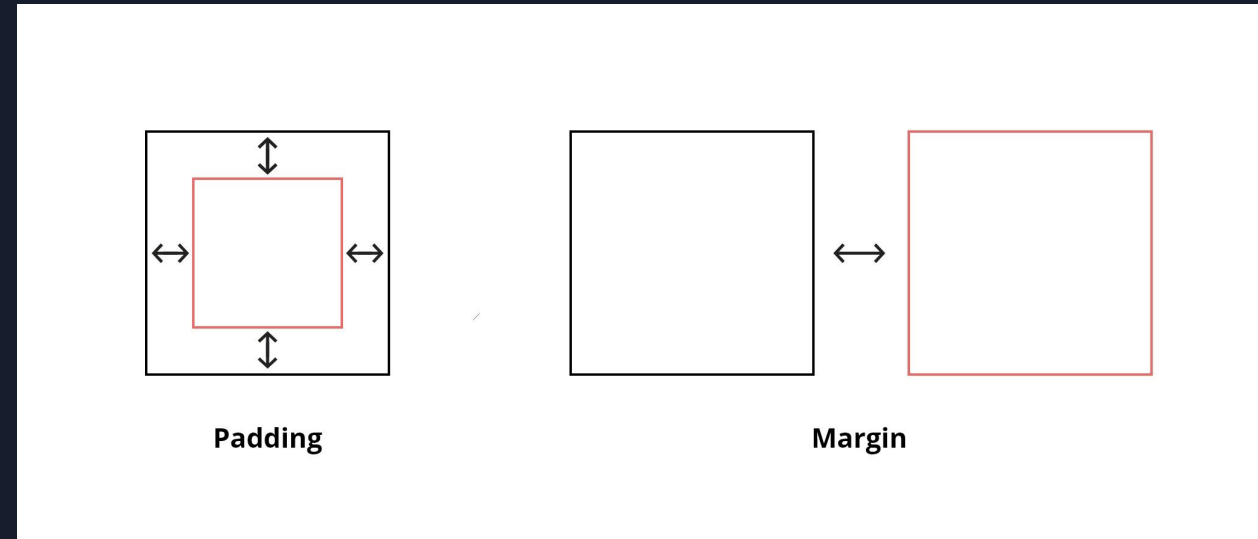


# Borders

- `border-color`
- Possible to control the color of each side separately
- `border-top-color`, `border-right-color`, ...
- Shorthand
- `border: 3px dotted #0088bb;`

# Margin, padding

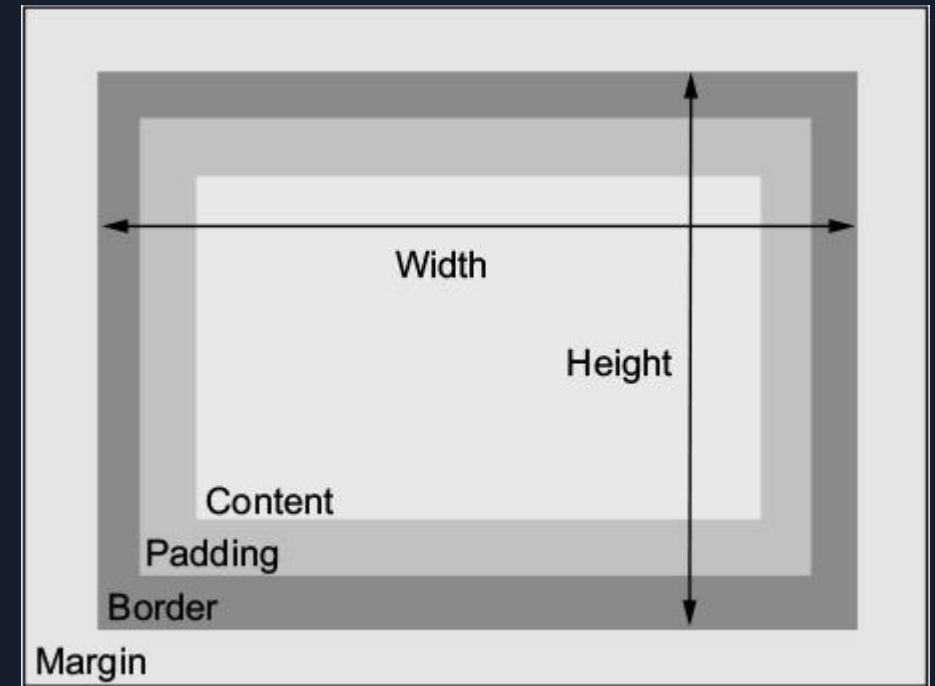
- margin, padding
- Value specified in px, pt, cm, em, etc.



- Possible to set values for each side separately
  - `margin-top`, `margin-right`, ...
  - `padding-top`, `padding-right`, ...
- 
- Shorthand: specify values for each side in a single declaration
  - Clockwise order: `top`, `right`, `bottom`, `left`
- `padding: 10px 5px 3px 1px;`

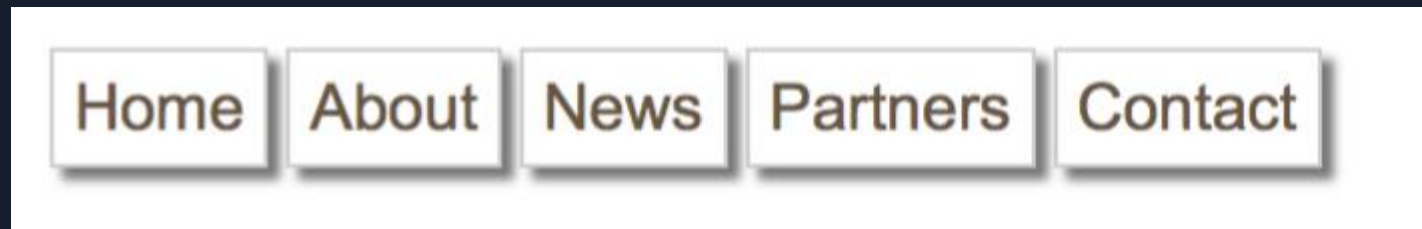
# Box dimensions

- width, height
  - pixels, percentages, or em, rem
- For designs that adjust depending on the size of the browser window
- min-width, max-width
- The smallest/widest a box can stretch
- min-height, max-height
- Limit minimum and maximum height



# CSS3: box shadow

- `box-shadow: 3px 3px 2px #777777;`
- horizontal offset
- vertical offset
- blur distance (optional)
- color



# CSS3: rounded corners

- border-radius: 5px
- Size of the radius in pixels

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# Lists and Tables

# List properties

- Shape of list item markers
  - Property: list-style-type
  - Values for unordered lists:
    - circle, square, ...
- Values for ordered lists:
  - upper-roman, lower-alpha, ...
- Remove list markers
  - list-style-type:none
- Using an image as the list item marker
  - list-style-image: url('filename.png')

## CSS FILE

```
ul {  
    list-style-image: url('images/img_marker.png');  
}  
ol {  
    list-style-type: upper-roman;  
}
```

## Index of Translated Poems

### Arthur Rimbaud

- ★ Ophelia
- ★ To Music
- ★ A Dream for Winter
- ★ Vowels
- ★ The Drunken Boat

# Tables

- Borders

- border, border-collapse

- Height, width

- height, width

- Text alignment

- Horizontally: text-align
  - Vertically: vertical-align

- Padding

- padding



# Tables

- Hovering
- Use the tr:hover selector to highlight table rows on mouseover

## CSS FILE

```
tr:hover {  
    background-color: #f5f5f5;  
}
```

- See [https://www.w3schools.com/css/css\\_table.asp](https://www.w3schools.com/css/css_table.asp)

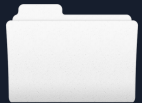
# Best practices

- Always use **rem** to set font sizes
- Use relative units for lengths (ems and percentages)
- Always fall back on a generic font
- Use numbers, not names, for colors
- Test with multiple browsers
- Know when to stop!
- Just because you can use 10 different fonts and 30 different colors on the same page doesn't mean you have to (or should)

# Exercise from #10 to #18



[https://github.com/weder96/programming\\_web/blob/main/exercises/html/css/README.md](https://github.com/weder96/programming_web/blob/main/exercises/html/css/README.md)



`exercises/html/css`