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ADVANCED CSS AND SASS

TAKE YOUR CSS TO THE NEXT LEVEL!

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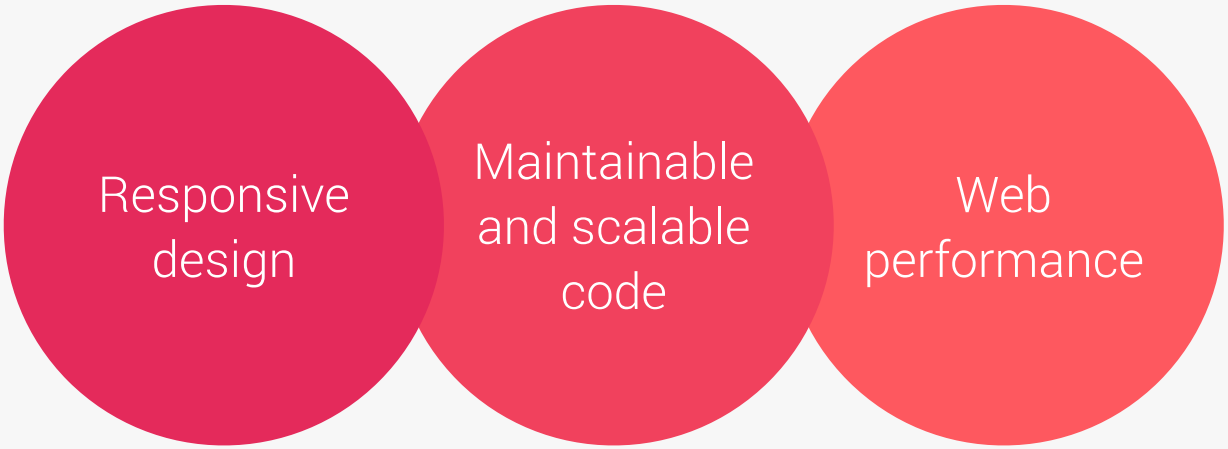
SECTION

HOW CSS WORKS: A LOOK BEHIND THE SCENES

LECTURE

THREE PILLARS OF WRITING GOOD HTML AND CSS (NEVER FORGET THEM!)

THREE PILLARS TO WRITE GOOD HTML AND CSS... AND BUILD GOOD WEBSITES



- Fluid layouts
- Media queries
- Responsive images
- Correct units
- Desktop-first vs mobile-first

- Clean
- Easy-to-understand
- Growth
- Reusable
- How to organize files
- How to name classes
- How to structure HTML

- Less HTTP requests
- Less code
- Compress code
- Use a CSS preprocessor
- Less images
- Compress images

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HOW CSS WORKS: A LOOK BEHIND THE SCENES

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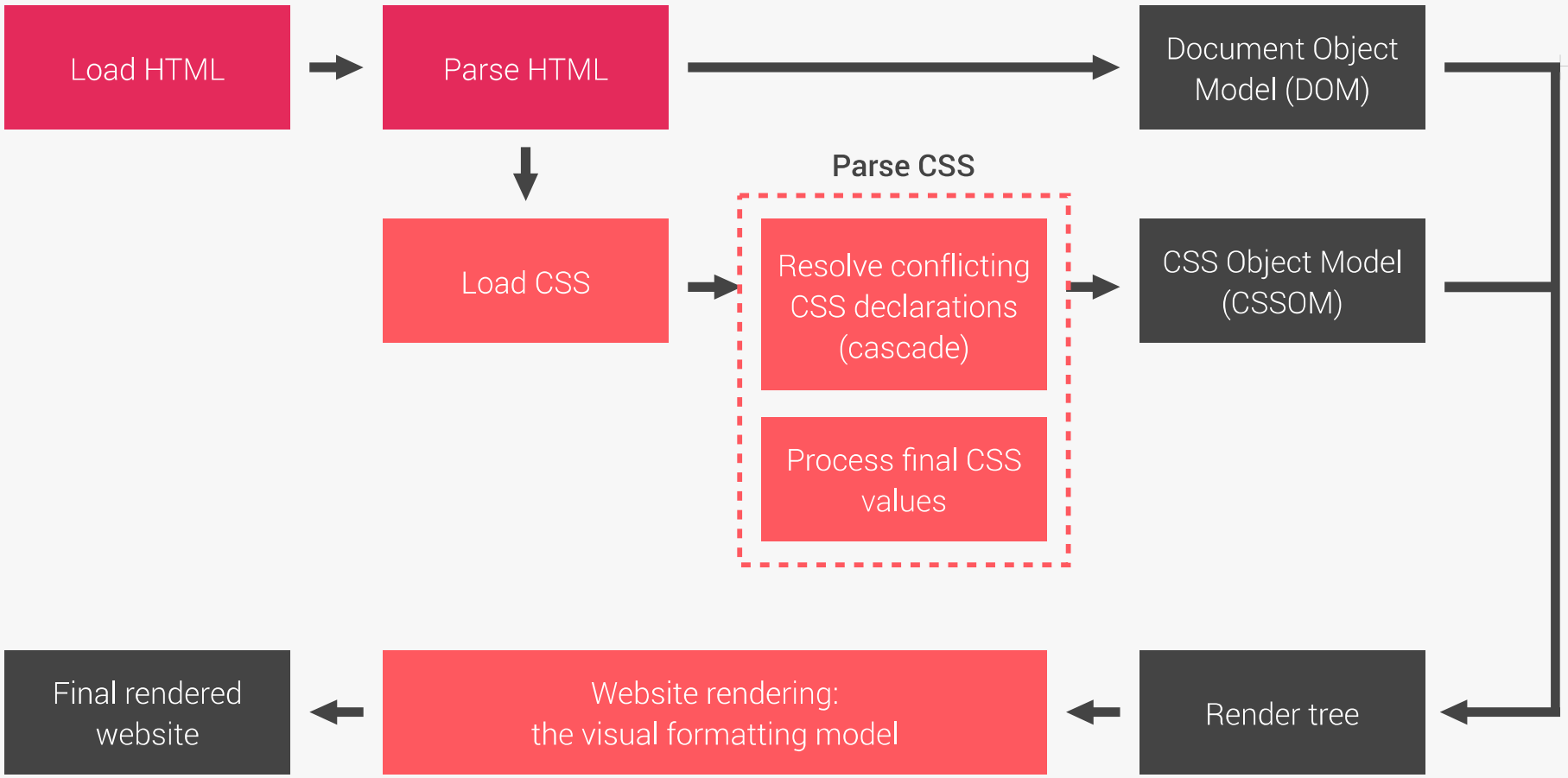
HOW CSS WORKS BEHIND THE SCENES: AN OVERVIEW

WHAT HAPPENS TO CSS WHEN WE LOAD UP A WEBPAGE?



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HOW CSS WORKS: A LOOK BEHIND THE SCENES

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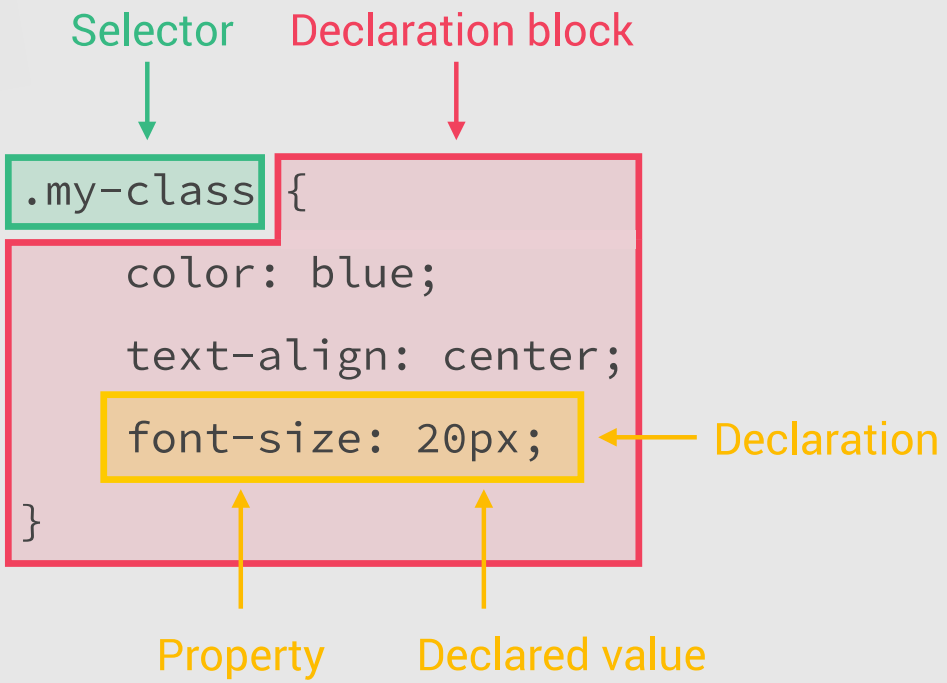
HOW CSS IS PARSED, PART 1: THE CASCADE AND SPECIFICITY

QUICK REVIEW: CSS TERMINOLOGY

A CSS RULE



THE CASCADE (THE "C" IN CSS)

CASCADE

Process of combining different stylesheets and resolving conflicts between different CSS rules and declarations, when more than one rule applies to a certain element.

- Author
- User
- Browser (user agent)

IMPORTANCE (WEIGHT) > SPECIFICITY > SOURCE ORDER

IMPORTANCE > SPECIFICITY > SOURCE ORDER

1. User `!important` declarations
2. Author `!important` declarations
3. Author declarations
4. User declarations
5. Default browser declarations

Same importance?

```
.button {
    font-size: 20px;
    color: white;
    background-color: blue !important;
}

#nav .pull-right .button {
  background-color: green;
}
```

Don't click here!

IMPORTANCE > SPECIFICITY > SOURCE ORDER

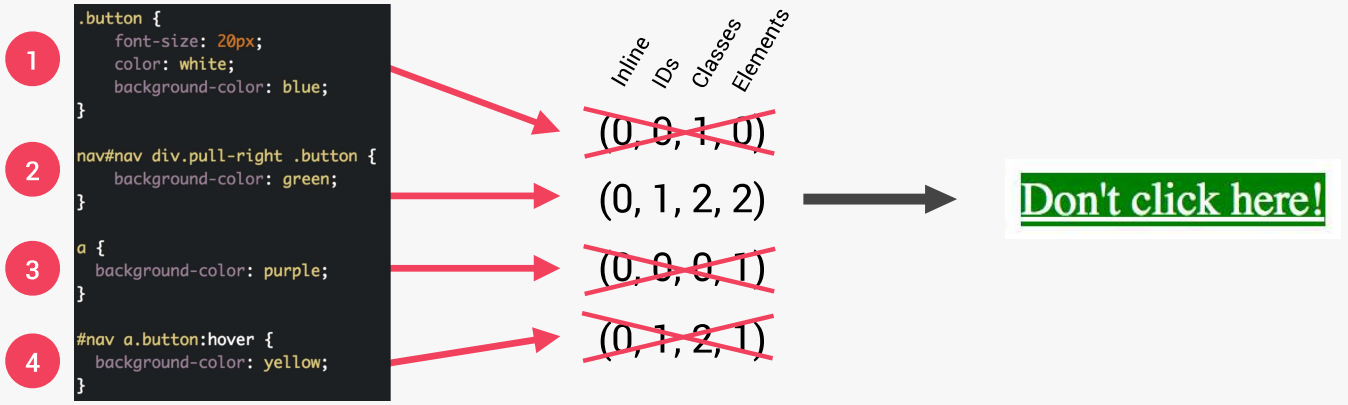
1. User `!important` declarations
2. Author `!important` declarations
3. Author declarations
4. User declarations
5. Default browser declarations

Same importance?

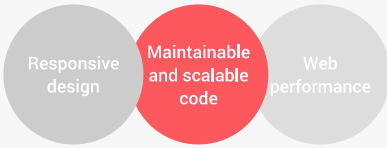
1. Inline styles
2. IDs
3. Classes, pseudo-classes, attribute
4. Elements, pseudo-elements

Same specificity?

The last declaration in the code will override all other declarations and will be applied.



CASCADE AND SPECIFICITY: WHAT YOU NEED TO KNOW



- CSS declarations marked with `!important` have the highest priority;
- But, only use `!important` as a last resource. It's better to use correct specificities — **more maintainable code**!
- Inline styles will always have priority over styles in external stylesheets;
- A selector that contains **1** ID is more specific than one with **1000** classes;
- A selector that contains **1** class is more specific than one with **1000** elements;
- The universal selector `*` has no specificity value (0, 0, 0, 0);
- Rely more on **specificity** than on the **order** of selectors;
- But, rely on order when using 3rd-party stylesheets — always put your author stylesheet last.

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SPECIFICITY IN PRACTICE


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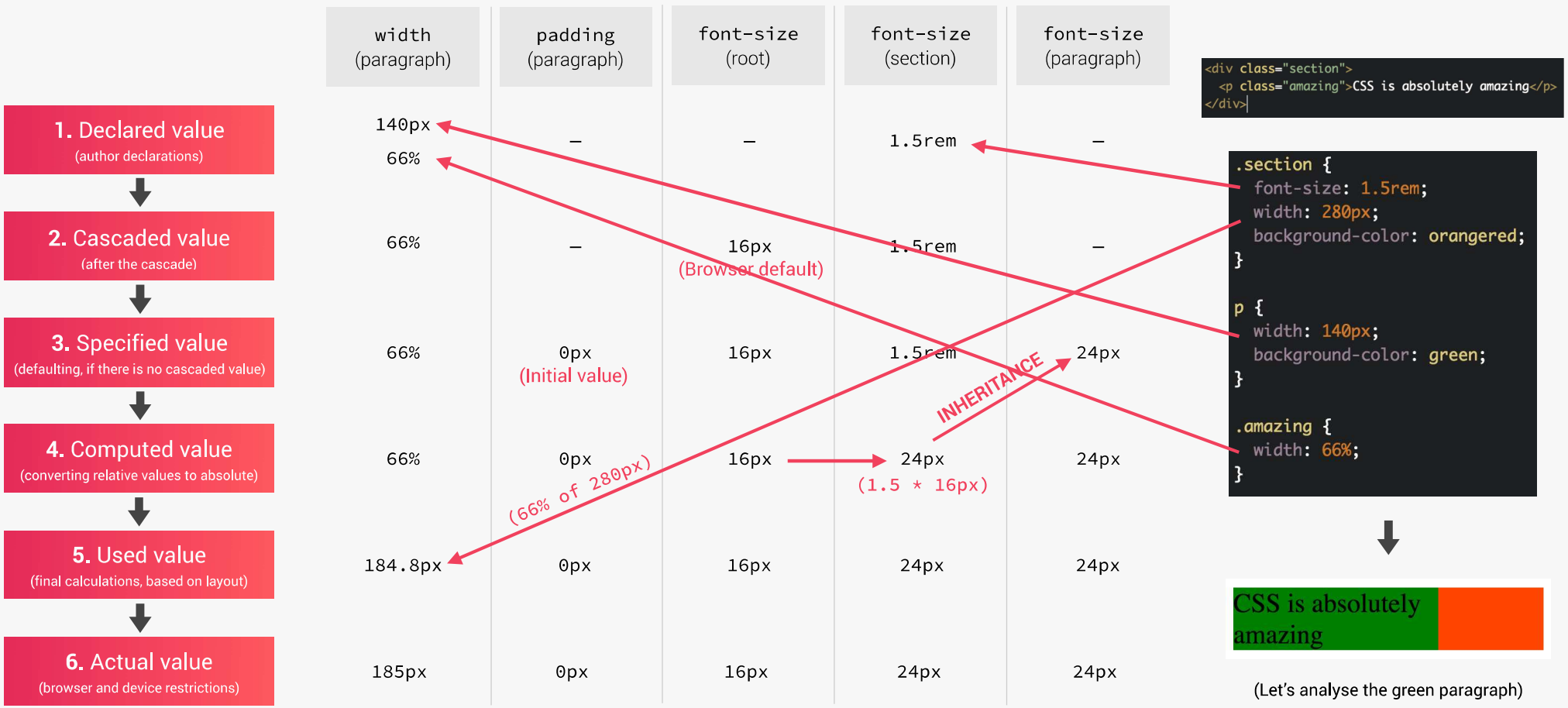
HOW CSS IS PARSED, PART 2: VALUE PROCESSING

HOW CSS VALUES ARE PROCESSED



(Let's analyse the green paragraph)

HOW UNITS ARE CONVERTED FROM RELATIVE TO ABSOLUTE (PX)

		Example (x)	How to convert to pixels	Result in pixels
	% (fonts)	150%	x% * parent's computed font-size	24px
	% (lengths)	10%	x% * parent's computed **width**	100px
Font-based	em (font)	3em	x * **parent** computed font-size	72px (3 * 24)
Font-based	em (lengths)	2em	x * **current element** computed font-size	48px
Font-based	rem	10rem	x * root computed font-size	160px
Viewport-based	vh	90vh	x * 1% of viewport height	90% of the current viewport height
Viewport-based	vw	80vw	x * 1% of viewport width	80% of the current viewport width

4. Computed value
(converting relative values to absolute)

```
html, body {
  font-size: 16px;
  width: 80vw;
}

header {
  font-size: 150%;
  padding: 2em;
  margin-bottom: 10rem;
  height: 90vh;
  width: 1000px;
}

.header-child {
  font-size: 3em;
  padding: 10%;
}
```

CSS VALUE PROCESSING: WHAT YOU NEED TO KNOW

- Each property has an initial value, used if nothing is declared (and if there is no inheritance — see next lecture);
- Browsers specify a **root `font-size`** for each page (usually `16px`);
- Percentages and relative values are always converted to pixels;
- Percentages are measured relative to their parent's **`font-size`**, if used to specify `font-size`;
- Percentages are measured relative to their parent's **`width`**, if used to specify lengths;
- `em` are measured relative to their **parent** `font-size`, if used to specify `font-size`;
- `em` are measured relative to the **current** `font-size`, if used to specify lengths;
- `rem` are always measured relative to the **document's root** `font-size`;
- `vh` and `vw` are simply percentage measurements of the viewport's `height` and `width`.

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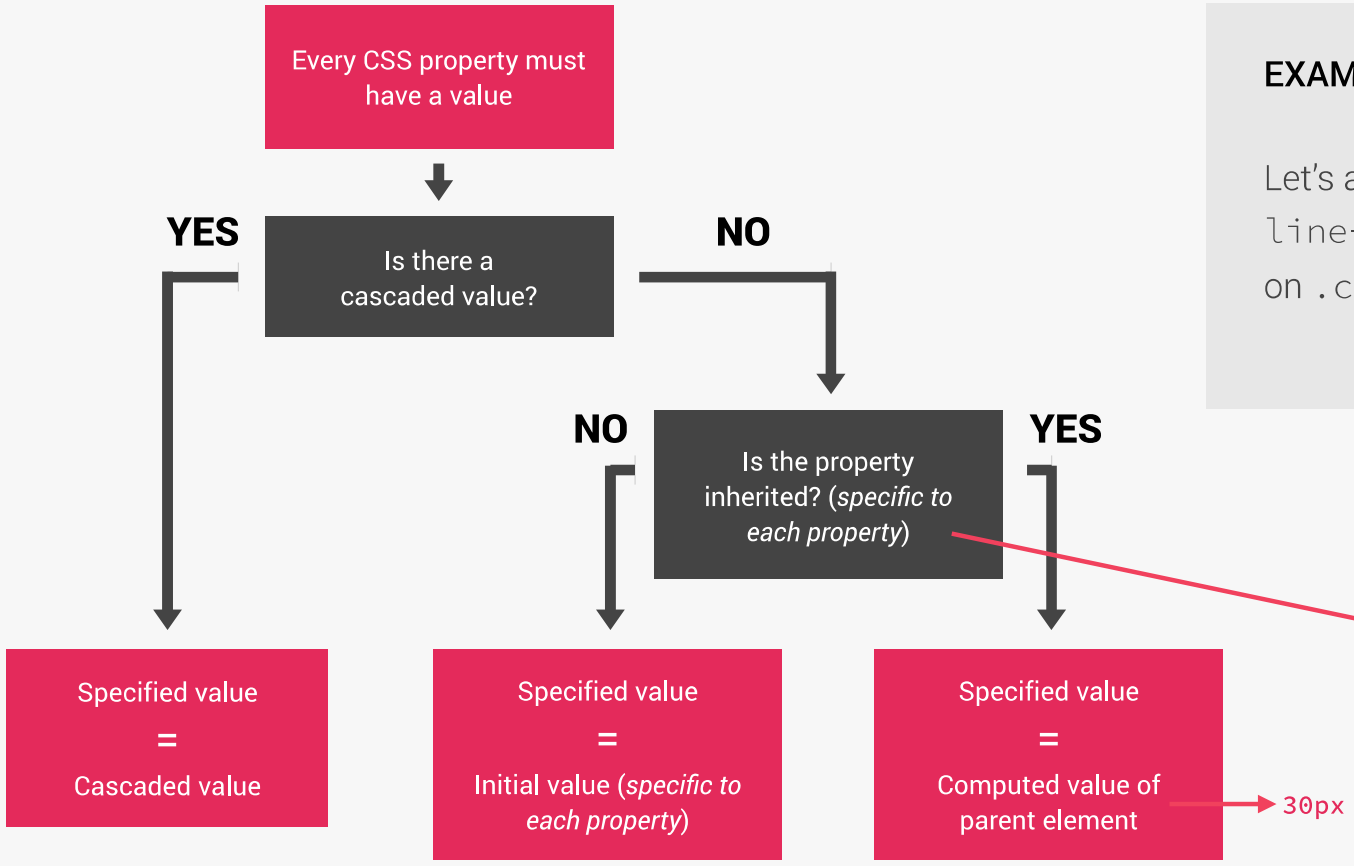
HOW CSS IS PARSED, PART 3: INHERITANCE

INHERITANCE IN CSS



THIS IS INHERITANCE!

EXAMPLE

Let's analyse `line-height` on `.child`

```
.parent {
  font-size: 20px;
  line-height: 150%;
}

.child {
  font-size: 25px;
}
```

`line-height` property specification

Initial value	`normal`
Applies to	all elements. It also applies to `::first-letter` and `::first-line`.
Inherited	yes
Percentages	refer to the font size of the element itself
Media	visual
Computed value	for percentage and length values, the absolute length, otherwise as specified
Animation type	either number or length
Canonical order	the unique non-ambiguous order defined by the formal grammar

Source: https://developer.mozilla.org/en/docs/Web/CSS/line-height

INHERITANCE: WHAT YOU NEED TO KNOW

- Inheritance passes the values for some specific properties from parents to children — **more maintainable code**;
- Properties related to text are inherited: `font-family`, `font-size`, `color`, etc;
- The computed value of a property is what gets inherited, **not** the declared value.
- Inheritance of a property only works if no one declares a value for that property;
- The `inherit` keyword forces inheritance on a certain property;
- The `initial` keyword resets a property to its initial value.

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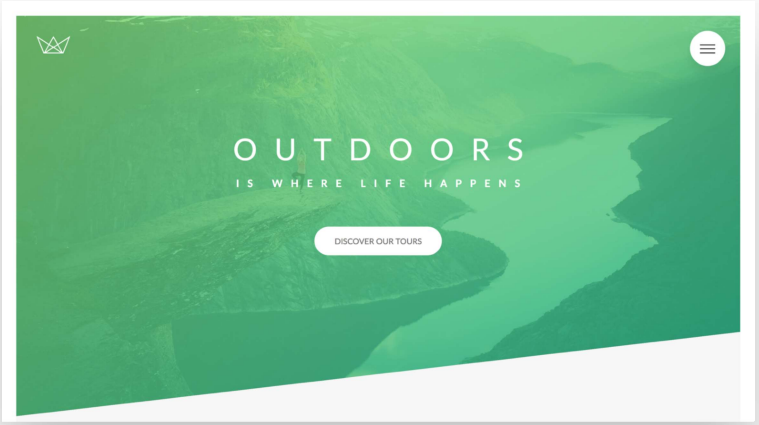
CONVERTING PX TO REM: AN EFFECTIVE WORKFLOW

WHAT YOU WILL LEARN IN THIS LECTURE

- How and why to use `rem` units in our project;
- A great workflow for converting `px` to `rem`.



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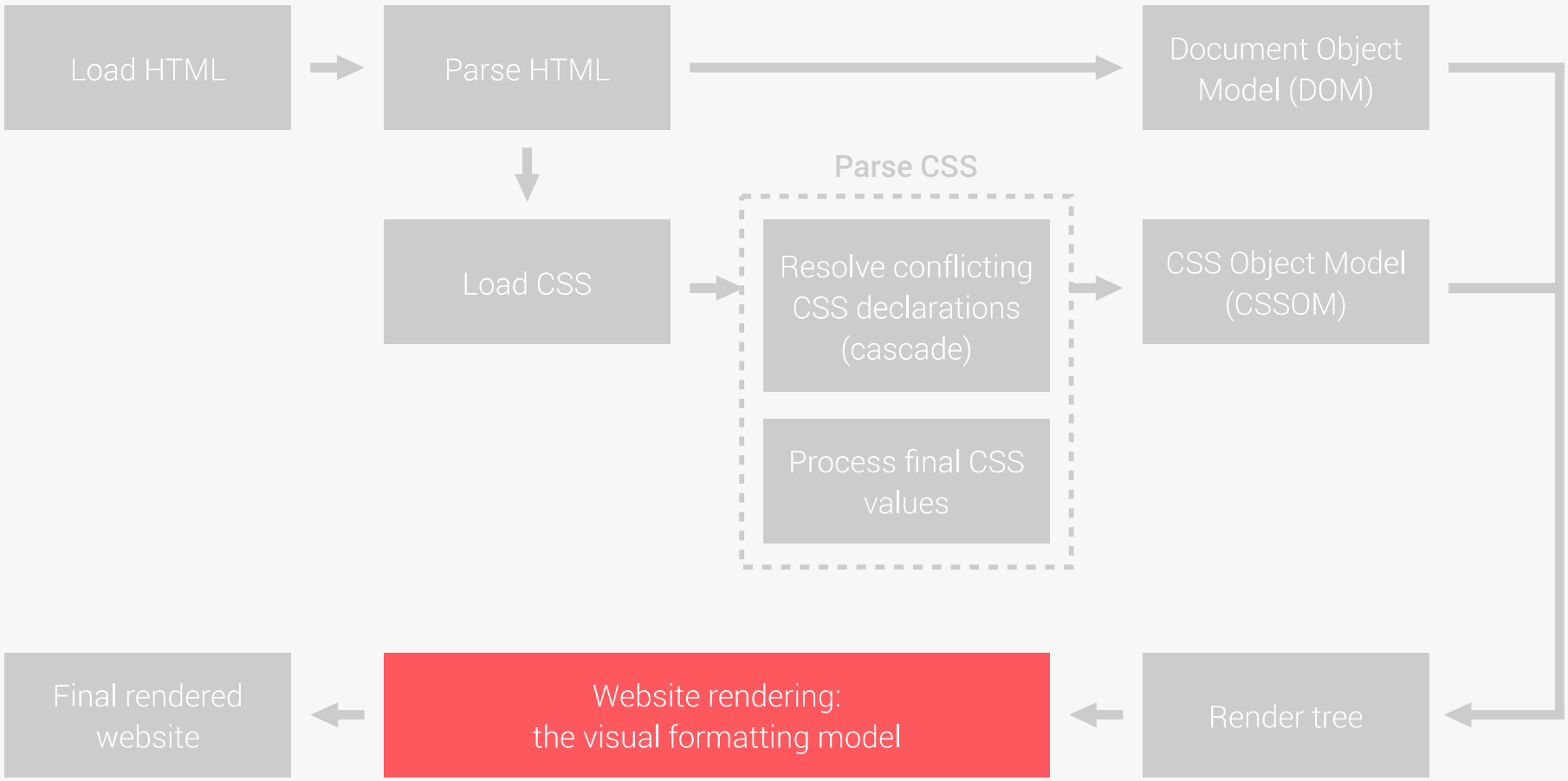
HOW CSS RENDERS A WEBSITE: THE VISUAL FORMATTING MODEL

REMEMBER...?

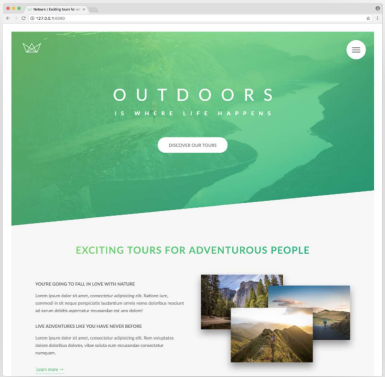

Load HTML
Parse HTML
Document Object Model (DOM)
Parse CSS
Load CSS
Resolve conflicting CSS declarations (cascade)
CSS Object Model (CSSOM)
Process final CSS values
Final rendered website
Website rendering: the visual formatting model
Render tree

THE VISUAL FORMATTING MODEL

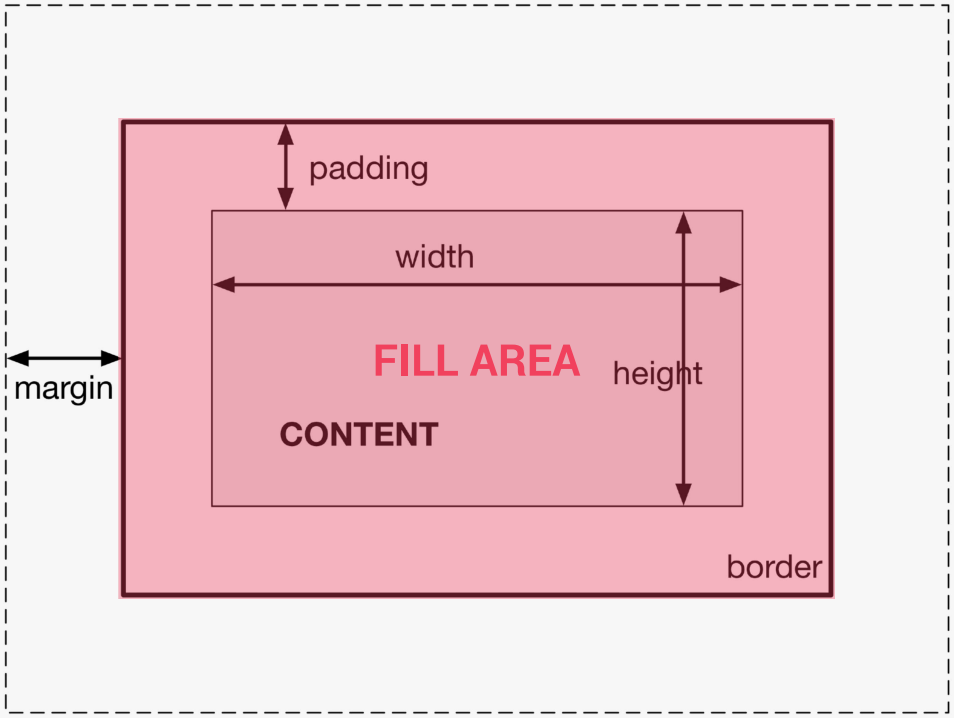
DEFINITION

Algorithm that calculates boxes and determines the layout of theses boxes, for each element in the render tree, in order to determine the final layout of the page.

- **Dimensions of boxes**: the box model;
- **Box type**: inline, block and inline-block;
- **Positioning scheme**: floats and positioning;
- **Stacking contexts**;
- Other elements in the render tree;
- Viewport size, dimensions of images, etc.



1. THE BOX MODEL



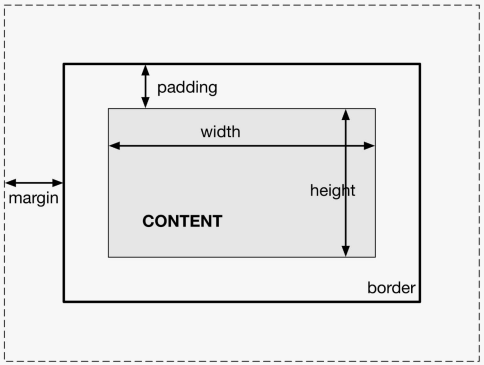
- **Content**: text, images, etc;
- **Padding**: transparent area around the content, inside of the box;
- **Border**: goes around the padding and the content;
- **Margin**: space between boxes;
- **Fill area**: area that gets filled with background color or background image.

1. THE BOX MODEL: HEIGHTS AND WIDTHS

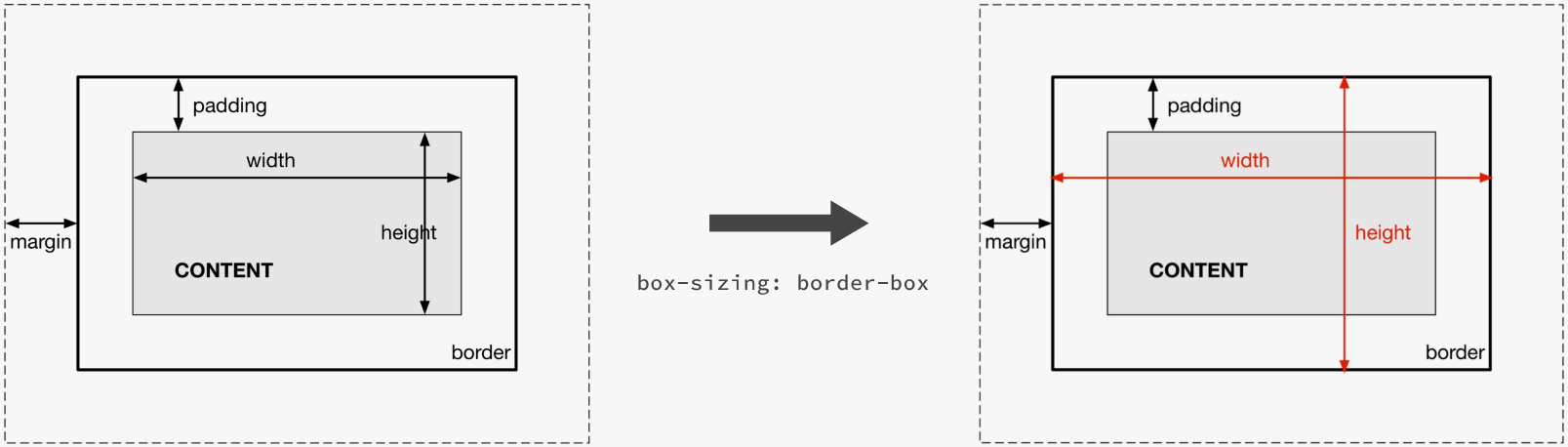
total width = right border + right padding + specified width + left padding + left border

total height = top border + top padding + specified height + bottom padding + bottom border

Example: height = 0 + 20px + 100px + 20px + 0 = 140px



1. THE BOX MODEL WITH BOX-SIZING: BORDER-BOX



total width = ~~right border~~ + ~~right padding~~ + specified width + ~~left padding~~ + ~~left border~~

total height = ~~top border~~ + ~~top padding~~ + specified height + ~~bottom padding~~ + ~~bottom border~~

Example: height = 0 + ~~20px~~ + 100px + ~~20px~~ + 0 = 100px

2. BOX TYPES: INLINE, BLOCK-LEVEL AND INLINE-BLOCK

Block-level boxes

- Elements formatted visually as blocks
- 100% of parent's width
- Vertically, one after another
- Box-model applies as showed

```
display: block
(display: flex)
(display: list-item)
(display: table)
```

Inline-block boxes

- A mix of block and inline
- Occupies only content's space
- No line-breaks
- Box-model applies as showed

```
display: inline-block
```

Inline boxes

- Content is distributed in lines
- Occupies only content's space
- No line-breaks
- No heights and widths
- Paddings and margins only horizontal (left and right)

```
display: inline
```

3. POSITIONING SCHEMES: NORMAL FLOW, ABSOLUTE POSITIONING AND FLOATS

Normal flow

- Default positioning scheme;
- **NOT** floated;
- **NOT** absolutely positioned;
- Elements laid out according to their source order.

```
Default
position: relative
```

Floats

- **Element is removed from the normal flow;**
- Text and inline elements will wrap around the floated element;
- The container will not adjust its height to the element.

```
float: left
float: right
```

=

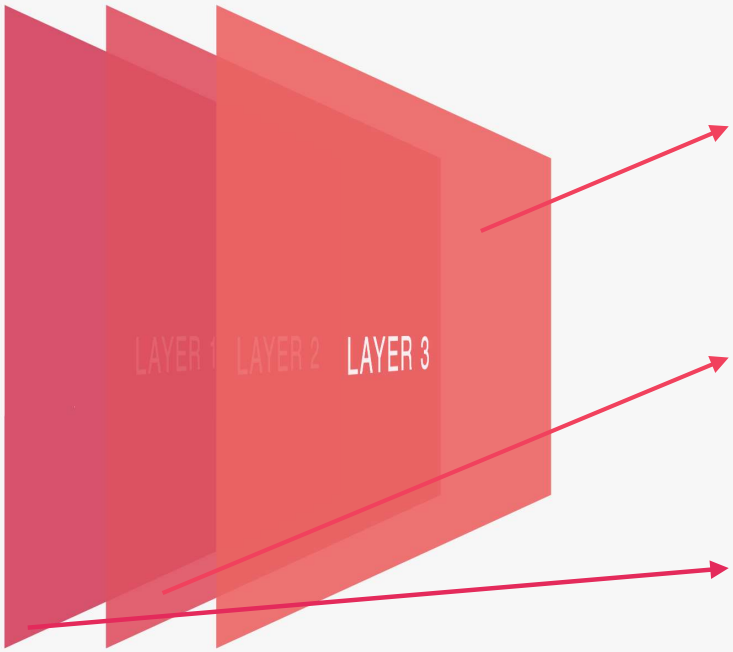
≠

Absolute positioning

- **Element is removed from the normal flow**
- No impact on surrounding content or elements;
- We use `top`, `bottom`, `left` and `right` to offset the element from its relatively positioned container.

```
position: absolute
position: fixed
```

4. STACKING CONTEXTS




```
z-index: 3
position: relative
```

```
z-index: 2
position: absolute
```

```
z-index: 1
position: relative
```

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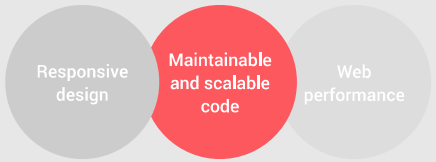
CSS ARCHITECTURE, COMPONENTS AND BEM

THE THINK - BUILD - ARCHITECT MINDSET



- Clean
- Modular
- Reusable
- Ready for growth

THINK

Think about the layout of your webpage or web app before writing code.

BUILD

Build your layout in HTML and CSS with a consistent structure for naming classes.

ARCHITECT

Create a logical **architecture** for your CSS with files and folders.

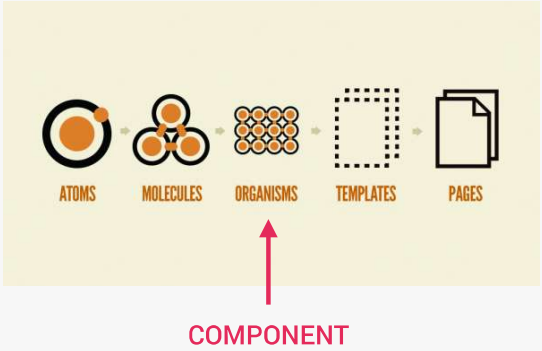
THINKING ABOUT THE LAYOUT

THINK → BUILD → ARCHITECT

COMPONENT-DRIVEN DESIGN

- **Modular building blocks** that make up interfaces;
- Held together by the **layout** of the page;
- **Re-usable** across a project, and between different projects;
- **Independent**, allowing us to use them anywhere on the page.

ATOMIC DESIGN



[Image taken from bradfrost.com]

BUILDING WITH MEANINGFUL CLASS NAMES

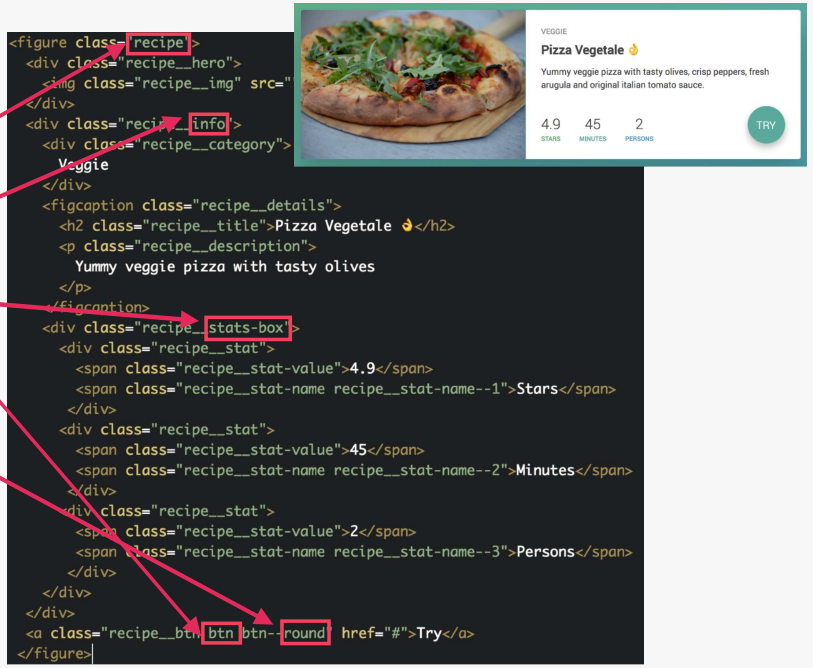
THINK → **BUILD** → ARCHITECT

BEM

- **B**lock **E**lement **M**odifier
- **BLOCK**: standalone component that is meaningful on its own.
- **ELEMENT**: part of a block that has no standalone meaning.
- **MODIFIER**: a different version of a block or an element.

```
.block {}
.block__element {}
.block__element--modifier {}
```

Low-specificity BEM selectors



ARCHITECTING WITH FILES AND FOLDERS

THINK → BUILD → ARCHITECT

THE 7-1 PATTERN

7 different folders for partial Sass files, and
1 main Sass file to import all other files into
a compiled CSS stylesheet.

THE 7 FOLDERS

- base/
- components/
- layout/
- pages/
- themes/
- abstracts/
- vendors/

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IMPLEMENTING BEM IN THE NATOUR PROJECT

WHAT YOU WILL LEARN IN THIS LECTURE

- How to use the BEM method in practice.