**Importance Order**

1. **!important** – User declarations
2. **!important** – Author declarations
3. **Author** **Declarations**
4. **User** **Declarations**
5. **Default Browser Declarations**

**\*NOTE:** If there is the same importance, CSS will use selector specificity to determine the most importance.

**Specificity Order**

1. Inline Styles – written in the HTML file
2. IDs
3. Classes, Pseudo-Classes, Attribute
4. Elements, Pseudo-Elements

**Specificity calculations:**

.button { //

    font-size: 20px;

    color: white;

    background-color: blue;

}

Inline 0

IDs 0

Classes 1 .button

Elements 0

Specificity = 0010

nav#nav div.pull-right .button {

    background-color: green;

}

Inline       0

IDs     1 #nav

Classes 2 .pull-right and .button

Elements     2 nav and div

Specificity = 0122

a {

    background-color: purple;

}

Inline 0

IDs 0

Classes     0

Elements 1 a tag

Specificity = 0001

#nav a.button:hover {

    background-color: yellow;

}

Inline 0

IDs 1 #nav

Classes 2 .button and :hover(pseudo-element)

Elements 1 a tag

Specificity = 0121

**\*NOTE:** If there is the same specificity:

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

**Rules for Cascade and Specificity**

* CSS declarations marked with !important have the highest priority
* Only use !important as the last resource. It’s better to use correct specificities – it makes the code more maintainable.
* 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
* Rely on the order when using 3rd-party stylesheets – always put your author stylesheet last

**CSS Value Processing**

* Each property has an initial value, used if nothing is declared (and if there is no inheritance)
* 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 measure 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 measure 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

**Inheritance**

* 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…
* Properties related to padding or margins ARE NOT INHERITED
* 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

**Box Types**

**Block-level boxes**

* Elements (paragraphs and divs) are set to block by default. We can change it.
* Occupies 100% of parent’s width
* Creates line breaks before and after
* Vertically, one after another

display: block

(display: flex)

(display: list-item)

(display:  table)

**Inline boxes**

* Content is distributed in lines
* Occupies only the content’s space
* There are no line-breaks
* There are no heights and widths meaning we cannot use these properties
* Paddings and margins only horizontal - left and right padding and margins only

display: inline

**Inline-block boxes**

* A mix of block and inline
* Occupies only the content’s space
* There are no line-breaks

display: inline-block

**Positioning Schemes**

**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 – use clearfix to resolve this issue

**\*Note:** When using float, all the height and width collapse. To fix this, use the clearfix method:

.clearfix::after {

    content: "";

    clear: both;

    display: table;

}

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

**Stacking Contexts**

* Determines the order in which elements are rendered on the webpage.
* These are layers where elements with a lower z-index is placed below elements with a higher z-index.

**Think – Build – Architect Mindset**

* Think about the layout of your webpage or web app before writing code.
* Build your layout in HTML and CSS with a consistent structure for naming classes.
* Create a logical architecture for hour CSS with files and folders.

**Think**

**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

**Build**

**Block Element Modifier (BEM)**

* **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 {}

**Architect**

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

1. base/

* \_animations.scss
* \_base.scss
* \_typography.scss
* \_utilities.scss – reusable class that performs 1 simple task.

1. components/ - contains independent reusable building blocks for our app which can be used anywhere
2. layout/ - contains global footer, global header that holds the components together
3. pages/

* \_home.scss

1. themes/ - for web app with different themes
2. abstracts/ - contains code that will not output any CSS (variables, mixins, and functions)

* \_mixins.scss
* \_variables.scss
* \_functions.scss

1. vendors/ - contains third-party CSS (bootstrap, animation framework, icon system)

**SASS**

* SASS is a CSS preprocessor, an extension of CSS that adds power and elegance to the basic language.
* We use SASS to fix problems with CSS.
* SASS Source Code 🡪 SASS Compiler 🡪 Compiled CSS Code

**Features of SASS**

* **Variables** – reusable values such as colors, font-sizes, spacing, etc…
* **Nesting** - nest selectors inside of one another, allowing us to write less code.
* **Operators** – mathematical operations right inside of CSS
* **Partials** and **Imports** – write CSS in different files and importing them all into one single file
* **Mixins** – write reusable pieces of CSS code (@mixin then use it with @include)
* **Functions** – like mixins, with the difference that they produce a value that can then be used
* **Extends** – make different selectors inherit declarations that are common to all of them
* **Control** **Directives** – writing complex code using conditionals and loops

**Installing SASS**

Install nodejs – <https://nodejs.org/en/>

node -v – check to see if you installed nodejs by checking the version in command line/terminal

Graphical user interface, text

Description automatically generated

Create a package.json file

Navigate to the project folder

Type npm init

Text

Description automatically generated

Now there should be a package.json package in your directory:

A screenshot of a computer

Description automatically generated with medium confidence

Install SASS package

npm install node-sass --save-dev

Text

Description automatically generated

Now check the package.json package to see if sass was installed:

  "devDependencies": {

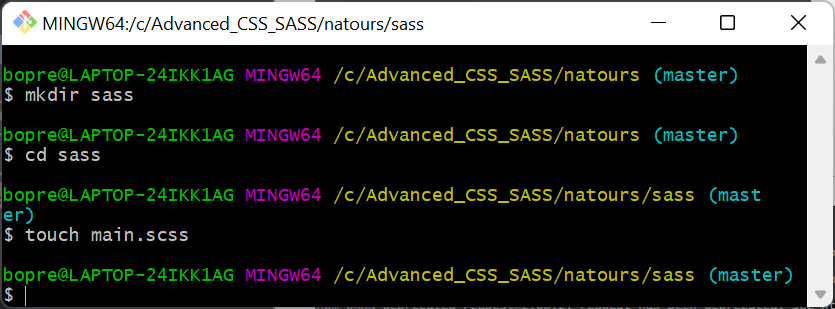
    "node-sass": "^7.0.3"

  }

Create a folder named sass

Change directory to sass

Create a main.scss file



Copy the entire contents of the CSS file into the main.scss file

Delete contents of style.css file now

To compile SASS file:

Go to package.json and add the line to the scripts:

  "scripts": {

    "compile:sass": "node-sass sass/main.scss css/style.css -w"

  },

node-sass – means that we want to use sass

sass/main.scss – the sass file (input)

css/style.css – the css file (output)

-w – will automatically save the changes we made in our main.scss file to style.css file

By have -w, we must have the terminal open so that it can track changes made:

Run npm run compile:sass

Text

Description automatically generated

Now the empty style.css file before will have the contents of the main.scss file however, the values will be converted to css in the style.css file.

\*Note: Look at the declared variable of primary-light and primary-dark in the style.css file.

style.css

rgba(40, 180, 133, 0.8)

main.scss

rgba($color-primary-light, 0.8)

**Live Server**

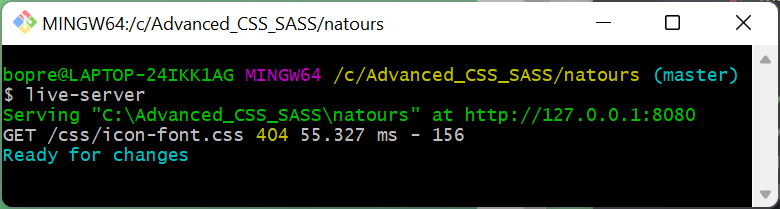
Install live-server globally:

npm install live-server -g

Text

Description automatically generated

To run live-server, type live-server. This will open our project in a new tab.



Note: npm run compile:sass and live-server needs to be running in order to see changes.

**Responsive Design Strategies**

**Desktop-First (max-width)**

Optimize our interfaces for large screens.

Start by writing CSS code for large screens.

Then, media queries shrink design to smaller screens.

html {

    font-size: 20px;

}

@media(max-width: 600px) {

    html {

        font-size: 16px;

    }

}

**Mobile-First (min-width)**

Start writing CSS for mobile devices: small screen.

Then, media queries expand design to a large desktop screen.

Forces us to reduce websites and apps to the absolute essentials.

html {

    font-size: 16px;

}

@media(min-width: 600px) {

    html {

        font-size: 20px;

    }

}

**Mobile-First Pros**

* 100% optimized for the mobile experience.
* Reduces websites and apps to the absolute essentials.
* Results in smaller, faster, and more efficient products.
* Prioritizes content over aesthetic design which may be desirable.

**Mobile-First Cons**

* The desktop version might feel overly empty and simplistic.
* More difficult and counterintuitive to develop.
* Less creative freedom making it more difficult to create distinctive products due to smaller screen.
* Clients are used to seeing a desktop version of the site as a prototype.
* Do you users even use the mobile internet? What’s the purpose of your website.

**Media Queries**

* Used to override specific global CSS code for specific viewport widths.
* Media queries do not add any importance or specificity to selectors. This means that code order matters.
* Media queries should be at the end of code.
* EM’s and REM’s in media queries ARE NOT AFFECTED by the root font-size.
* Use EM’s in media queries because REM’s fail to work in some browsers.

**Breakpoints**

The viewport’s width where we want our design to change (where we want to place our media queries).

**Breakpoints (BAD)**

* Using the width of the most popular used devices.
* Only optimizing the use for one particular device and not considering other devices.
* **Not** future-proof – need to change all media queries in every project if for example Apple changes the resolution on their devices.

**Breakpoints (GOOD)**

* Look at the widths of the most used devices on the internet and group them in a logical way and choose our breakpoints accordingly.

**Breakpoints (PERFECT)**

* Ignore widths of devices and only choose breakpoints based on the contents of our design.
* Start with either mobile-first or desktop-first
* Decrease screen width for desktop-first
* Increase screen width for mobile-first
* As soon as design breaks (it no longer works), then add a breakpoint.

Choose breakpoints based on this website:

<https://statcounter.com/>

**Responsive Images**

The goal is to serve the right images to the right screen size and device to avoid downloading unnecessary large images on smaller screens.

**Example:**

**OK NOT OK**

1mb image -> large screen 1mb image -> small screen (phone)

1mb image -> large screen 200kb image -> small screen (phone)

**3 Use Cases of Responsive Images**

* **Resolution Switching** – Decrease image resolution on smaller screen.

<!-- RESOLUTION SWITCHING - WIDTH DESCRIPTOR = 300w, 1000w.  SIZES used to inform browser of different viewport widths.  sizes="(max-width: 900px) 20vw" means that at 900px, make the image take up 20vw(which is 20%) of the viewport width.  If there is no match, our DEFAULT SIZE is 300px.

To calculate the 20vw, go inspect in browser, set the width of page to 900px, right-click on image and click'inspect'.  Take the width of image and divide by 900 to get the % needed for the WIDTH DESCRIPTOR. -->

<img srcset="img/nat-1.jpg 300w, img/nat-1-large.jpg 1000w"

sizes="(max-width: 900px) 20vw, (max-width: 600px) 30vw, 300px"

alt="Photo 1"

class="composition\_\_photo composition\_\_photo--p1">

* **Density Switching** – Half the image resolution on @1x screen. @2x screen (high-res). @1x screen (low-res).

<!-- srcset used to specify 2 images.  High resolution and lower resolution images on devices (phone).  1x,2x - DENSITY DESCRIPTORS -->

<img srcset="img/logo-green-1x.png 1x, img/logo-green-2x.png 2x" alt="Full logo" class="footer\_\_logo">

* **Art Direction** – Different image on smaller screen. Using one image on one screen width and another image on a different screen width.

<!-- ART DIRECTION - specify multiple SOURCE for the same image (srcset="img/logo-green-small-1x.png 1x, img/logo-green-small-2x.png 2x") - Then we use media="(max-width: 37.5em)" which is in our media query for phones.  if the width is higher than 37.5em(600px), then we use the <img srcset="img/logo-green-1x.png 1x, img/logo-green-2x.png 2x" alt="Full logo">  -->

<picture class="footer\_\_logo">

    <source srcset="img/logo-green-small-1x.png 1x, img/logo-green-small-2x.png 2x" media="(max-width: 37.5em)">

<!-- srcset used to specify 2 images.  High resolution and lower resolution images on devices (phone).

1x,2x are DENSITY DESCRIPTORS -->

<img srcset="img/logo-green-1x.png 1x, img/logo-green-2x.png 2x" alt="Full logo">

</picture>

**Responsive Images CSS**

    // RESPONSIVE IMAGES CSS.  This is for high resolution screens > 192dpi

    // hero.jpg is shown when (min-resolution: 192dpi) AND (min-width: 37.5em), OR (mind-width: 125em)

    // Convert px to em - 600px / 16 = 37.5em  -  2000px / 16 = 125em

    @media (min-resolution: 192dpi) and (min-width: 37.5em), (min-width: 125em) {

        background-image: linear-gradient(to right bottom,

            rgba($color-secondary-light, 0.8),

            rgba($color-secondary-dark, 0.8)),

        url(../img/hero.jpg);

    }