

# Cascading Layers of !mportance



Miriam Suzanne @ **An Event Apart, Denver**  
October 11, 2022



**The 'c' in...**

# CHSS

# Cascading HTML style sheets -- a proposal

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10 Oct 1994

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v0.92 This document describes work in progress and is incomplete as a basis for implementation. Its primary purpose is to establish guiding principles and propose a level of functionality for HTML style sheet

## Abstract

This document proposes a style sheet scheme for HTML documents. The proposed scheme provides a simple mapping between HTML elements and presentation hints. Properties like font family and window size are determined by presentation decisions based on the user's environment; e.g. the size of the screen or the current date.

The style sheet scheme is designed so that style sheets can be cascaded; the user/browser specifies initial preferences and hands the remaining influence over to the style sheets referenced in the incoming document description languages.

The scheme supports visual as well as non-visual media.

## Introduction

Style sheets are a part of the web today. Browsers, especially the GUI variants, support ways for the user to specify presentation parameters like fonts and colors. There are several reasons why the current function

- current style sheets are static, they seldom change within the lifetime of a browser process. This makes the visual environment sparse.
- current style sheets are implemented using platform-specific notations, e.g. X11 resources. While some may consider this to be a feature, it prohibits general mechanisms for passing styles over the web.
- the author of HTML documents has no influence over the presentation. Indeed, if conflicts arise the user should have the last word, but one should also allow the author to attach style hints.

The last point has especially been a source of much frustration among professions that are used to be in control of paper-based publishing. This proposal tries to soften the tension between the author and the reader.

- a) giving readers a richer visual (or auditory and tactile) environment while they retain control if necessary, and
- b) providing authors and publishers with stylistic influence without resorting to page description languages.

The proposed scheme is balanced in the sense that it provides author and reader with the same notation for specifying style. While the author (or publisher) often wants to give the documents a distinct look and feel, designing a style sheet notation that fits both groups' needs is a challenge.

## The cascade

The proposed scheme supplies the browser with an ordered list (cascade) of style sheets. The user supplies the initial sheet which may request total control of the presentation, but -- more likely -- hands most of

```
<LINK REL="style" HREF="http://NYT.com/style">
```



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Info  
**HyperMedia Browser/Editor**  
An excercise in global information availability  
by Tim Berners-Lee  
Version 1.0  
Alpha only  
1990,91, CERN. Distribution restricted: ask for terms. TEST VERSION ONLY  
Text: Text which is not constrained to be linear.  
Media: Information which is not constrained linear or to be text

Welcome to the Universe of HyperText

File View

## Home

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### How to proceed

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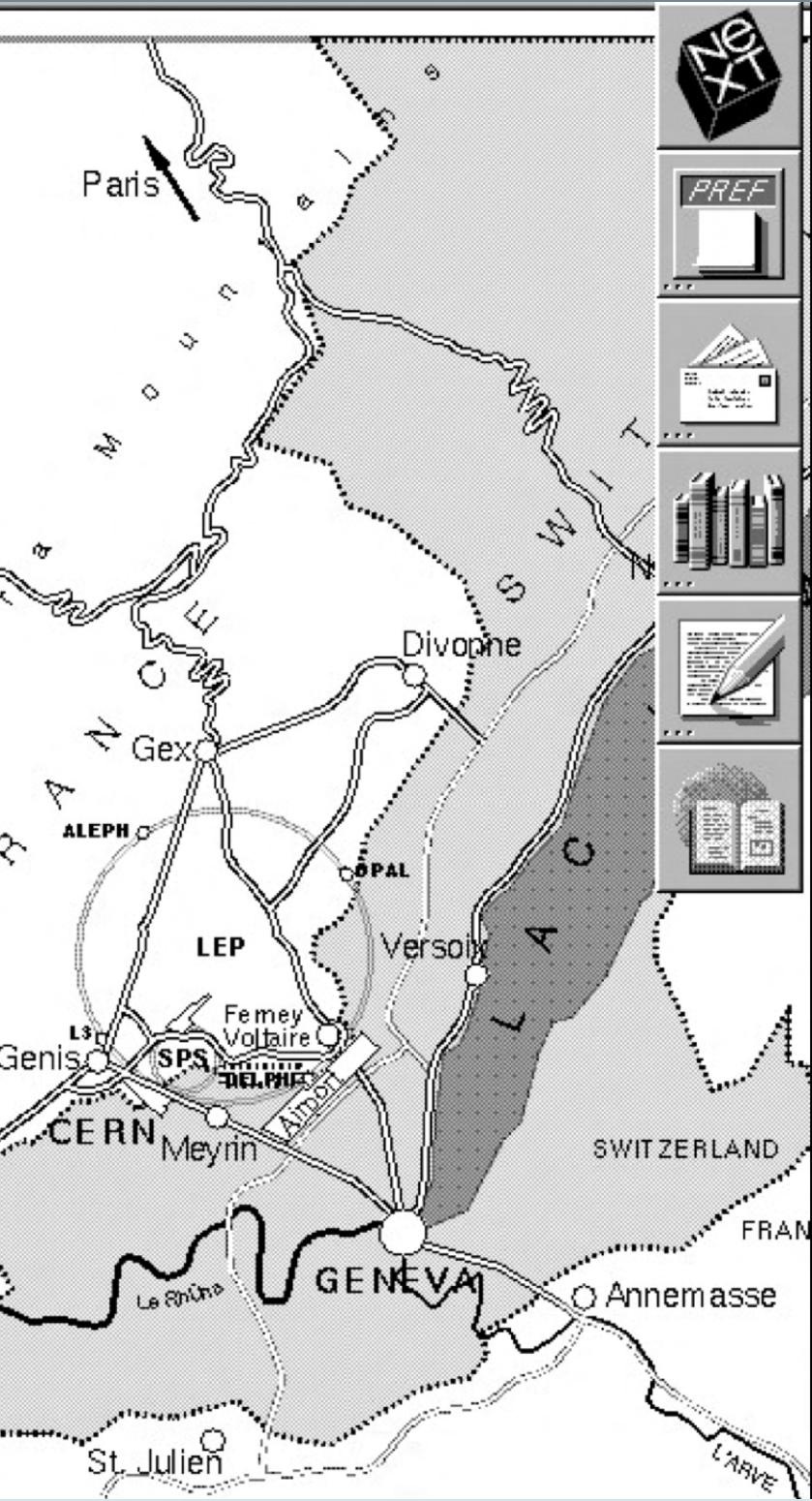
[CERN Information](#) A general keyword index of information made available by the computer centre, including CERN, Cray and IBM help files, "Writeups", and the Computer Newsletter (CNL). (This is the same data on CERNVM which is also available on CERNVM with the VM [FIND command](#) ).

[Yellow Pages](#) A keyword index to the CERN telephone book by function.

You can access the internet news scheme ([See information for new users](#)). News articles are distributed typically CERN-wide or worldwide, and have a finite lifetime.

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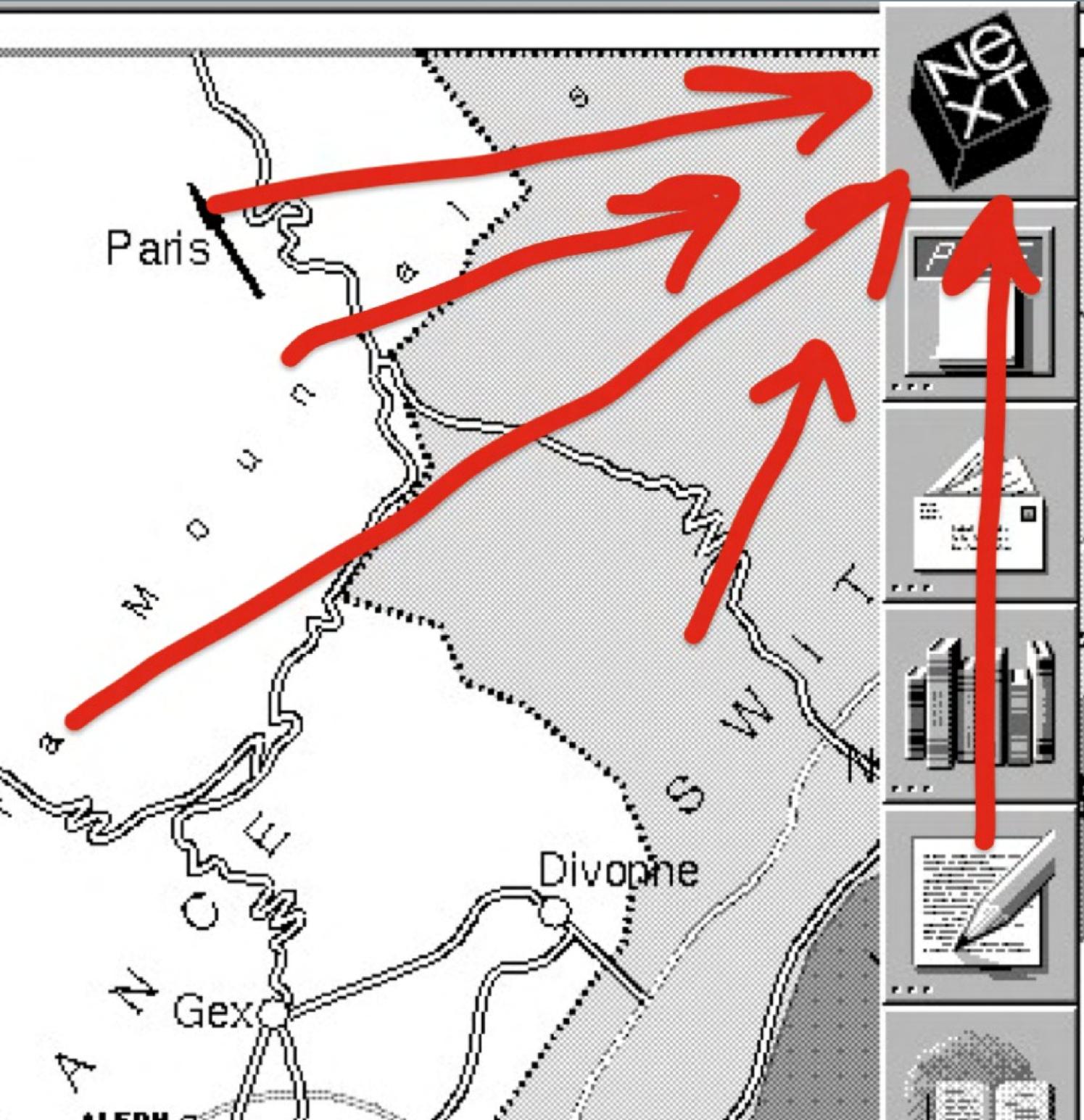
## Use of HyperText

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PC System Information - Advanced Edition, V2.0, Sept 1987, 1988, Peter Norton

Computer Name: L001-PC  
Operating System: MS-DOS 3.00  
Processor: 80386  
Motherboard:  
CPU Processor: 13MHz  
Video Adapter:  
Current Video Mode:  
Available Video Modes:  
Memory Size:  
Disk Capacity:  
Disk Cache:  
Keyboard:  
Monitor:  
Resolution: 640 x 480  
Text: 256 x 256 Monochrome  
320 x 256 Color  
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## WORLD WIDE WEB

The WorldWideWeb (W3) is a wide-area hypermedia[1] information retrieval initiative aiming to give universal access to a large universe of documents.

Everything there is online about W3 is linked directly or indirectly to this document, including an executive summary[2] of the project, Mailing lists[3] , Policy[4] , November's W3 news[5] , Frequently Asked Questions[6] .

What's out there?[7]Pointers to the world's online information, subjects[8] , W3 servers[9], etc.

Help[10] on the browser you are using

Software Products[11] A list of W3 project components and their current state. (e.g. Line Mode[12] ,X11 Viola[13] , NeXTStep[14] , Servers[15] , Tools[16] , Mail robot[17] , Library[18] )

Technical[19] Details of protocols, formats, program internals etc

<ref.number>, Back, <RETURN> for more, or Help: |

**" Web for all. Web on everything.**

– W3C Mission, Design Principles,

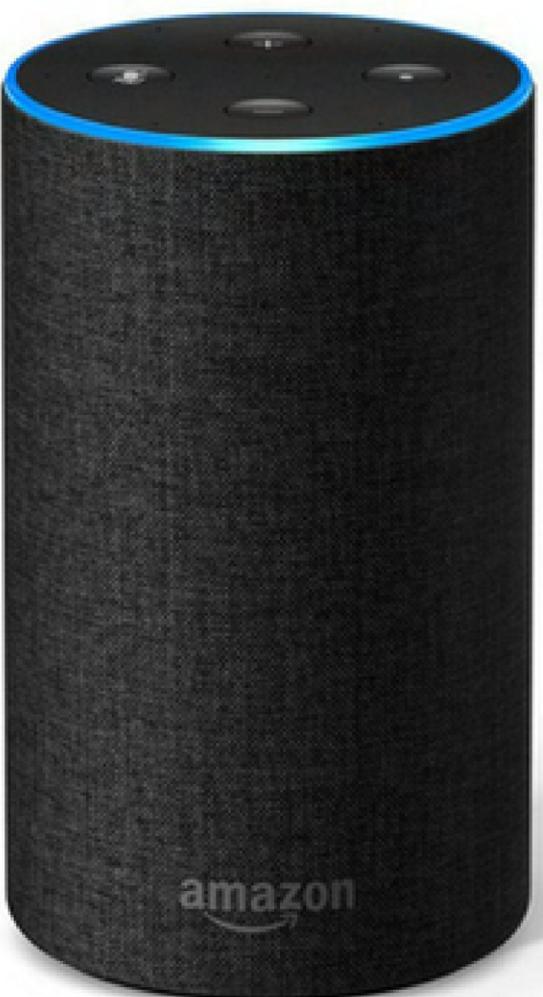














gettyimages

Comstock Images



# Design Constraints

When designing the [HTML](#) document type, consideration was given to a certain simplicity in order to allow many browsers and hopefully editors to be developed on many platforms.

## Lack of nesting

Many text editing systems (Microsoft Word, The NeXT text object, the Mac text object, etc) handle text in a variety of styles but do not have any concept of nestable structure in the SGML sense.

The constraint here is therefore that HTML be able to be mapped into a sequence of paragraphs of styled text, and that if that text is edited that the editor should be able to map the sequence of styles back onto (eg LI within UL) but no general nesting, as a finite and small set of styles is used. In particular, the styles are not parameterized by the nesting level.

## Logical Markup

It is required that HTML be a common language between all platforms. This implies no device-specific markup, or anything which requires control over fonts or colors, for example. This is in keeping with the

***"It is required that HTML be a common language between all platforms...***

*– WWW Project*

**"...This implies no device-specific markup, or anything which requires control over fonts or colors.**

- WWW Project

*Web Design*  
**will Never Happen**



*@TerribleMia*

**Miriam Suzanne**

*Not a*  
**Lack of Design**

## WORLD WIDE WEB

The WorldWideWeb (W3) is a wide-area hypermedia[1] information retrieval initiative aiming to give universal access to a large universe of documents.

Everything there is online about W3 is linked directly or indirectly to this document, including an executive summary[2] of the project, Mailing lists[3] , Policy[4] , November's W3 news[5] , Frequently Asked Questions[6] .

What's out there?[7]Pointers to the world's online information, subjects[8] , W3 servers[9], etc.

Help[10] on the browser you are using

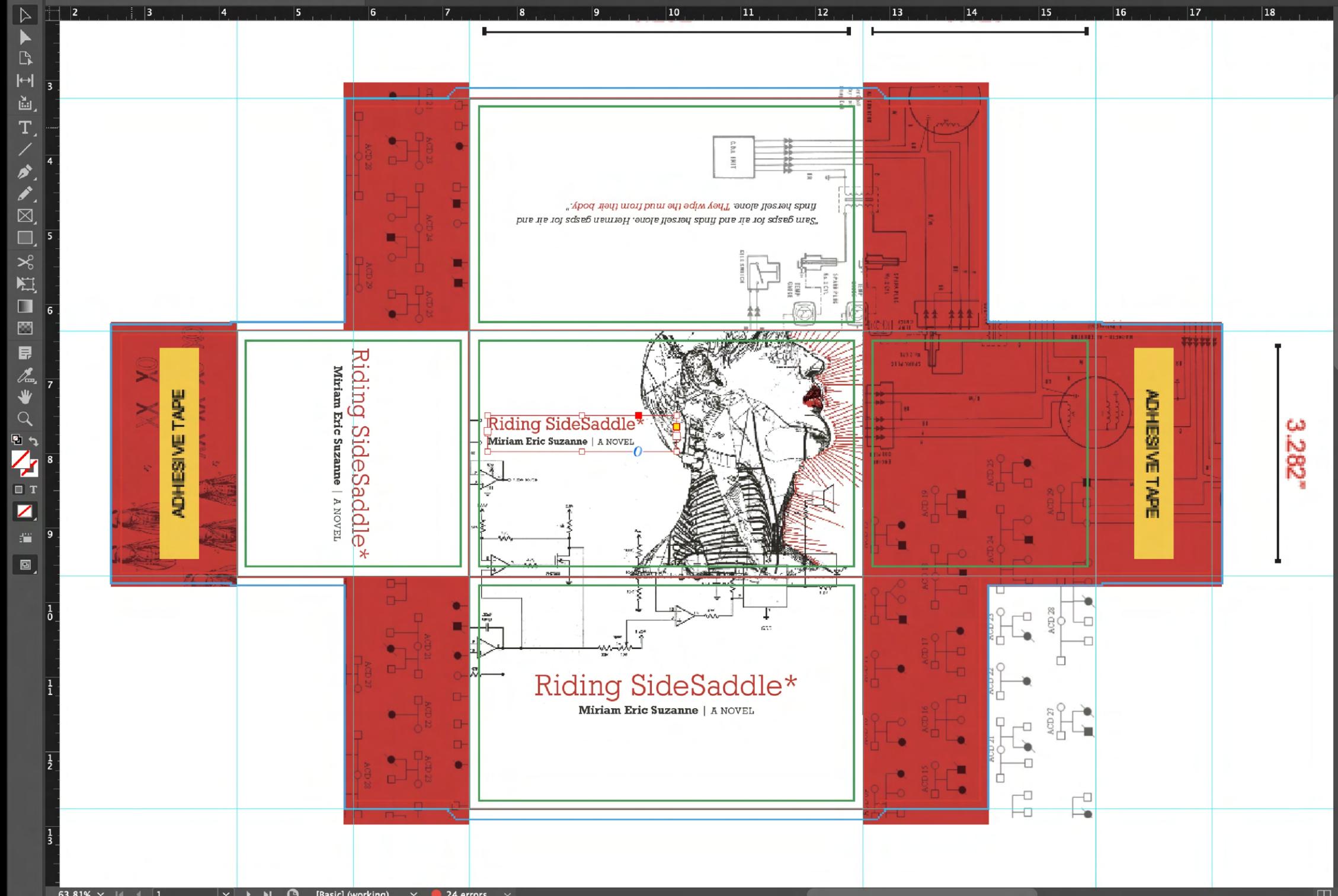
Software Products[11] A list of W3 project components and their current state. (e.g. Line Mode[12] ,X11 Viola[13] , NeXTStep[14] , Servers[15] , Tools[16] , Mail robot[17] , Library[18] )

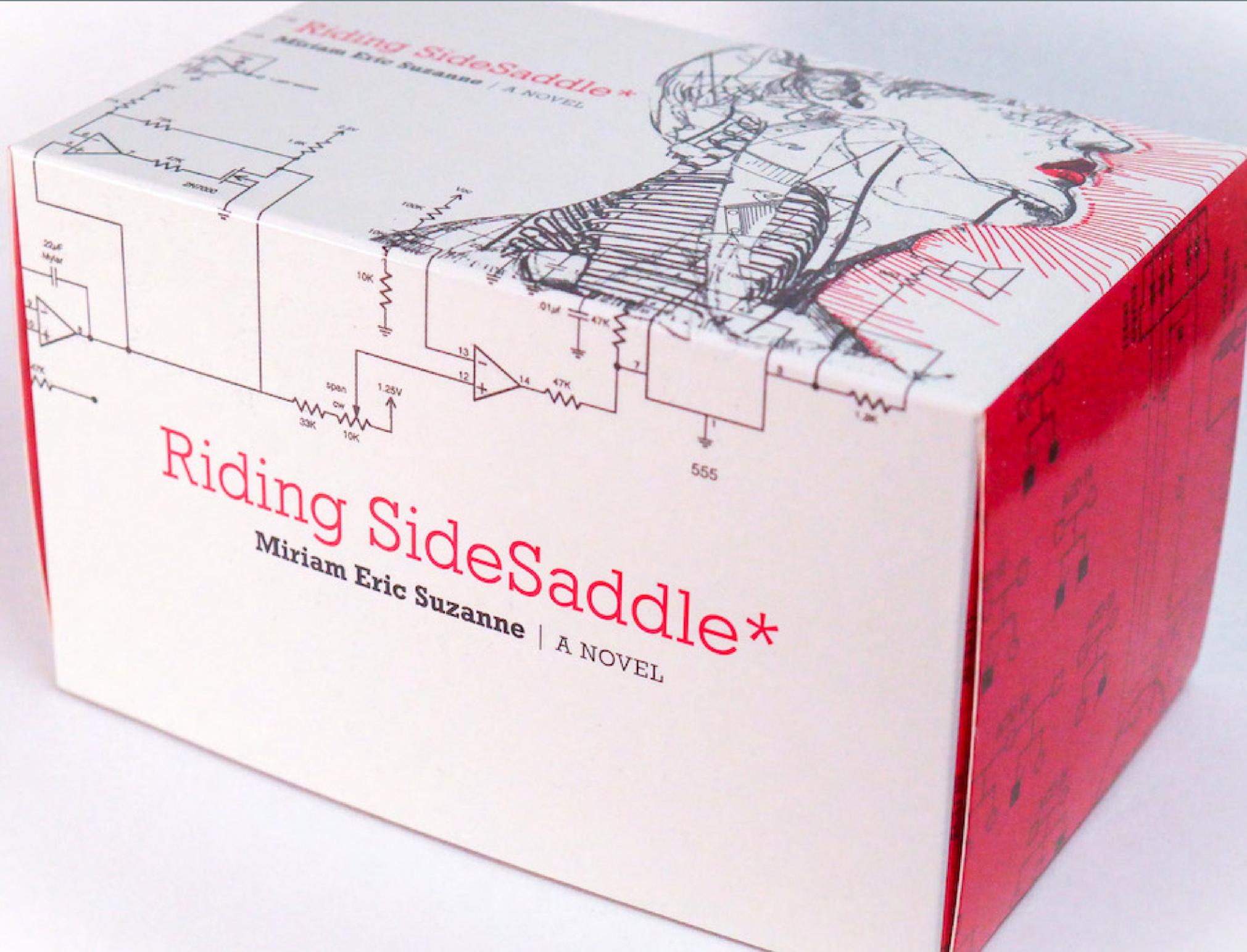
Technical[19] Details of protocols, formats, program internals etc

<ref.number>, Back, <RETURN> for more, or Help: |

*A lack of*

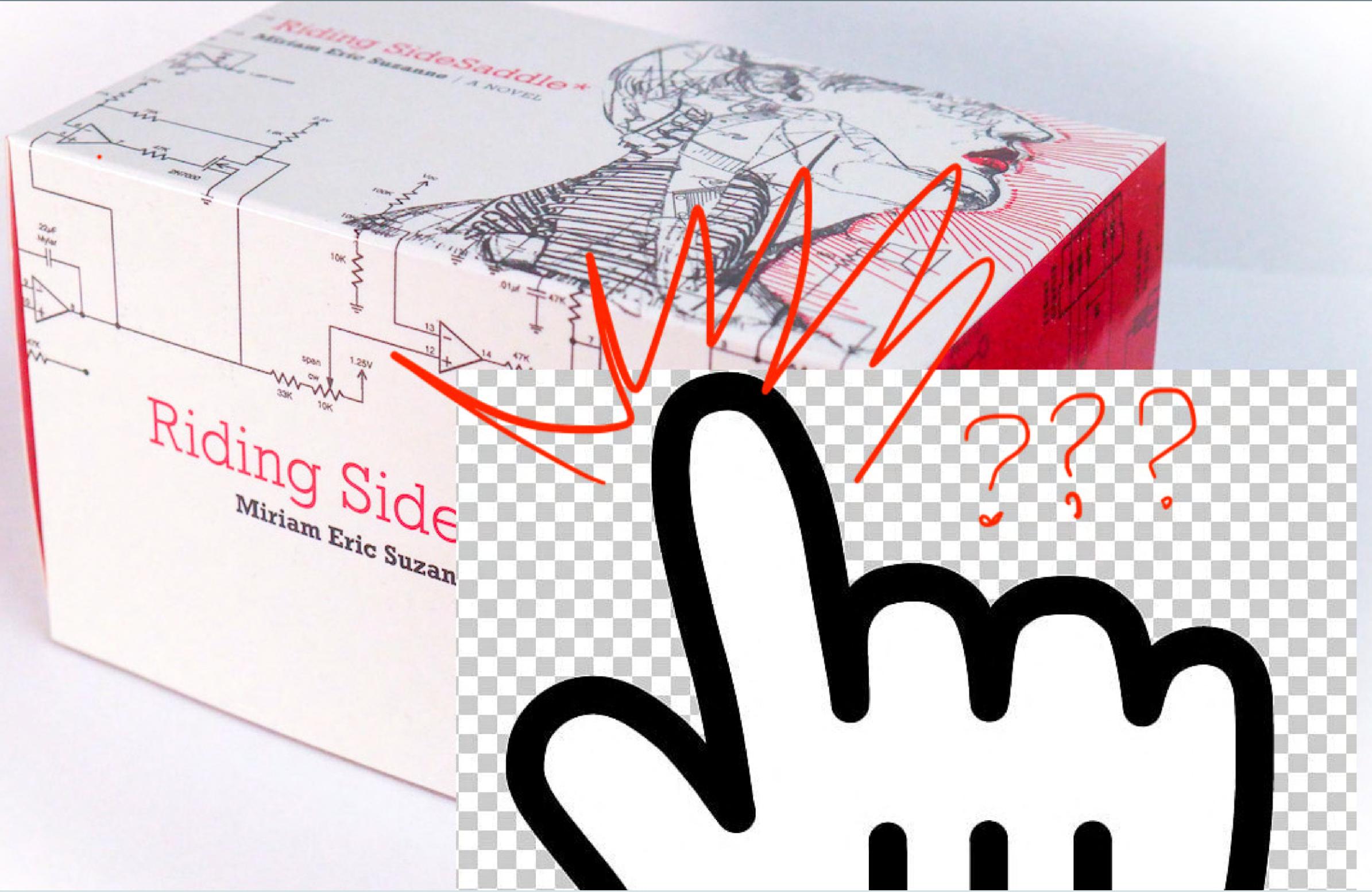
# **Design Control**

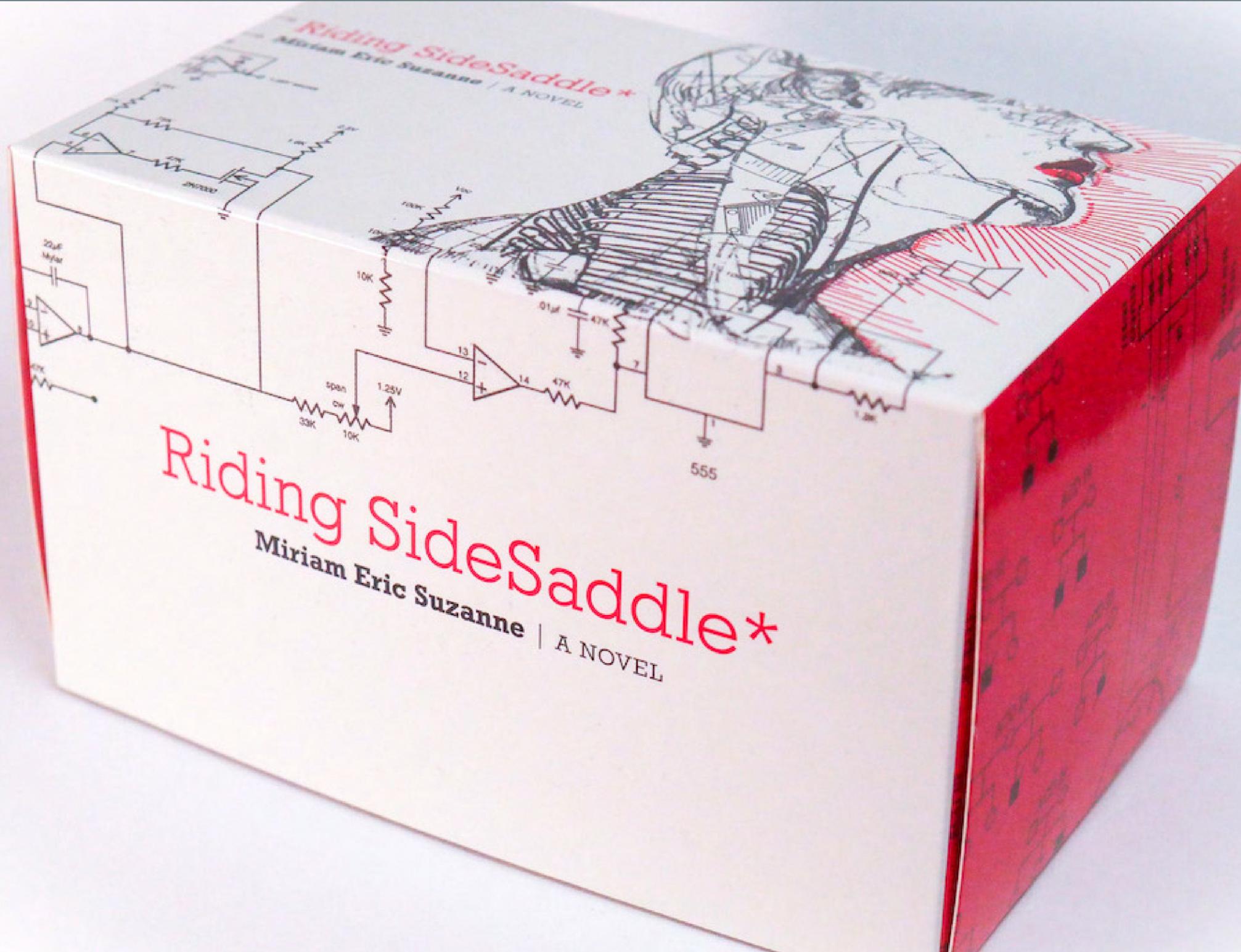




**”The fact we can control a paper page is really a limitation of that medium.**

– John Allsopp, 2000





*The Goal...*

# A Web That Adapts

**"The web would have become a giant fax machine where pictures of text would be passed along.**

– Håkon Lie

*@media  
min-width*

**" Web for all. Web on everything.**

– W3C Mission, Design Principles,

*@media  
prefers-reduced-motion*

*@media  
hover*

*@supports  
container-type: inline-  
size*

*Styles*

**Must be Responsive**

**...And collaborative**









**"** This proposal tries to *soften the tension between the author and the reader.*

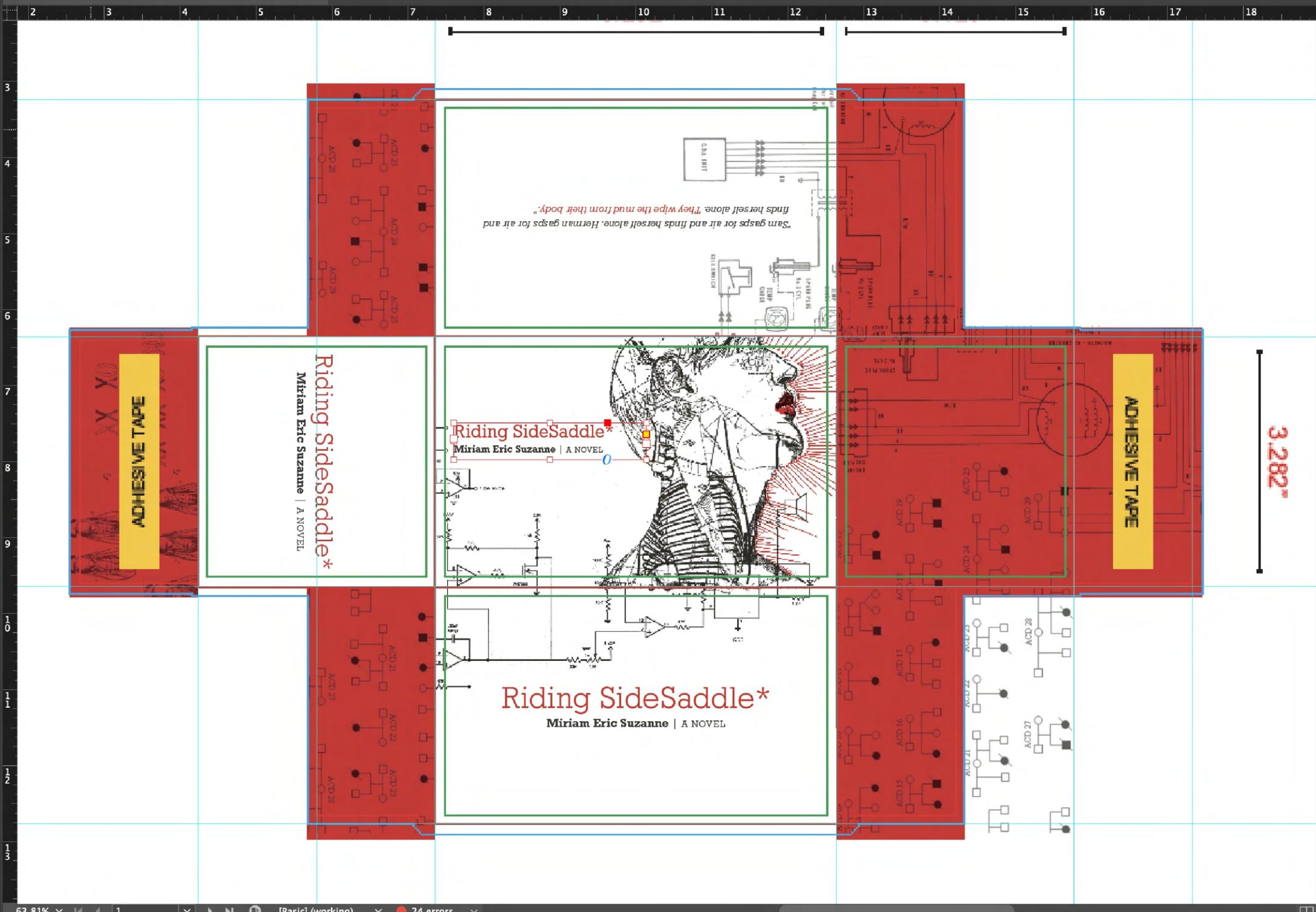
– Håkon Lie

**"The user/browser specifies initial preferences and hands the remaining influence over to the document.**

– Håkon Lie

**"We're designing dynamic content with unknown  
collaborators on an infinite and unknowable canvas,  
across operating systems, interfaces, writing-  
modes, & languages..."**

- me



**"Provide hints that the browser may or may not use.**

– Håkon Lie

# CSS Declarations

*property:* value;

*color: blue;*

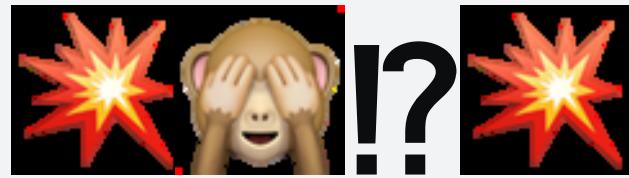
```
<button style='color: blue'>...</button>
```

```
button { color: violet; }
```

```
<link rel="stylesheet" href="so-many-hints.css">  
<style>...</style>
```

**"An ordered list (*cascade*) of style sheets.  
Referenced from the same document.**

– Håkon Lie



*<button style='color: blue'>...</button>*

*button { color: violet; }*

# Multiple or Unknown !?

*color:* teal;

*color:* violet;

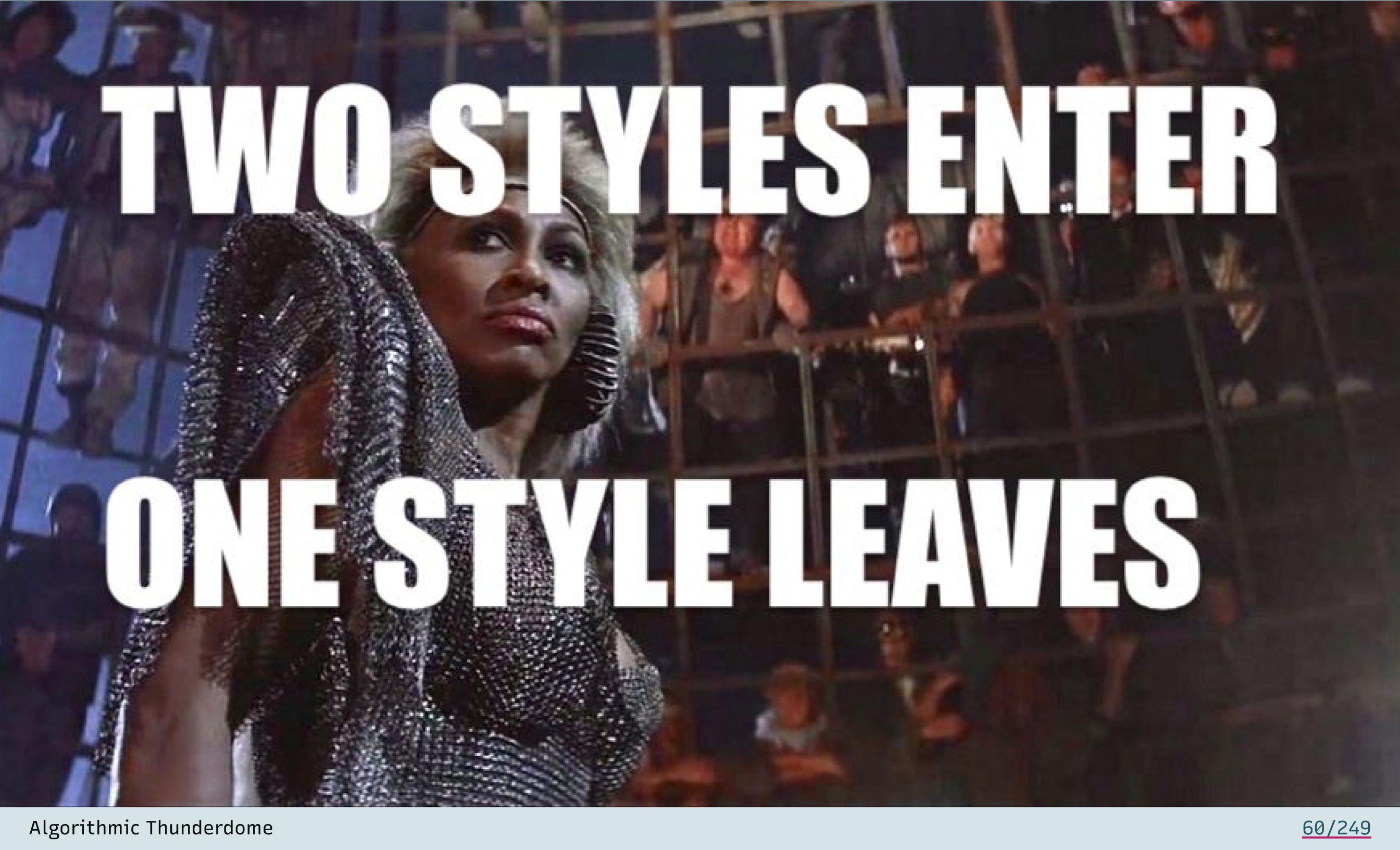
*color:* oklch(79.269% 0.171 70.67);

**On every** *html element,*  
**For every** *css property*  
**We need exactly one value**

*Rules for...*

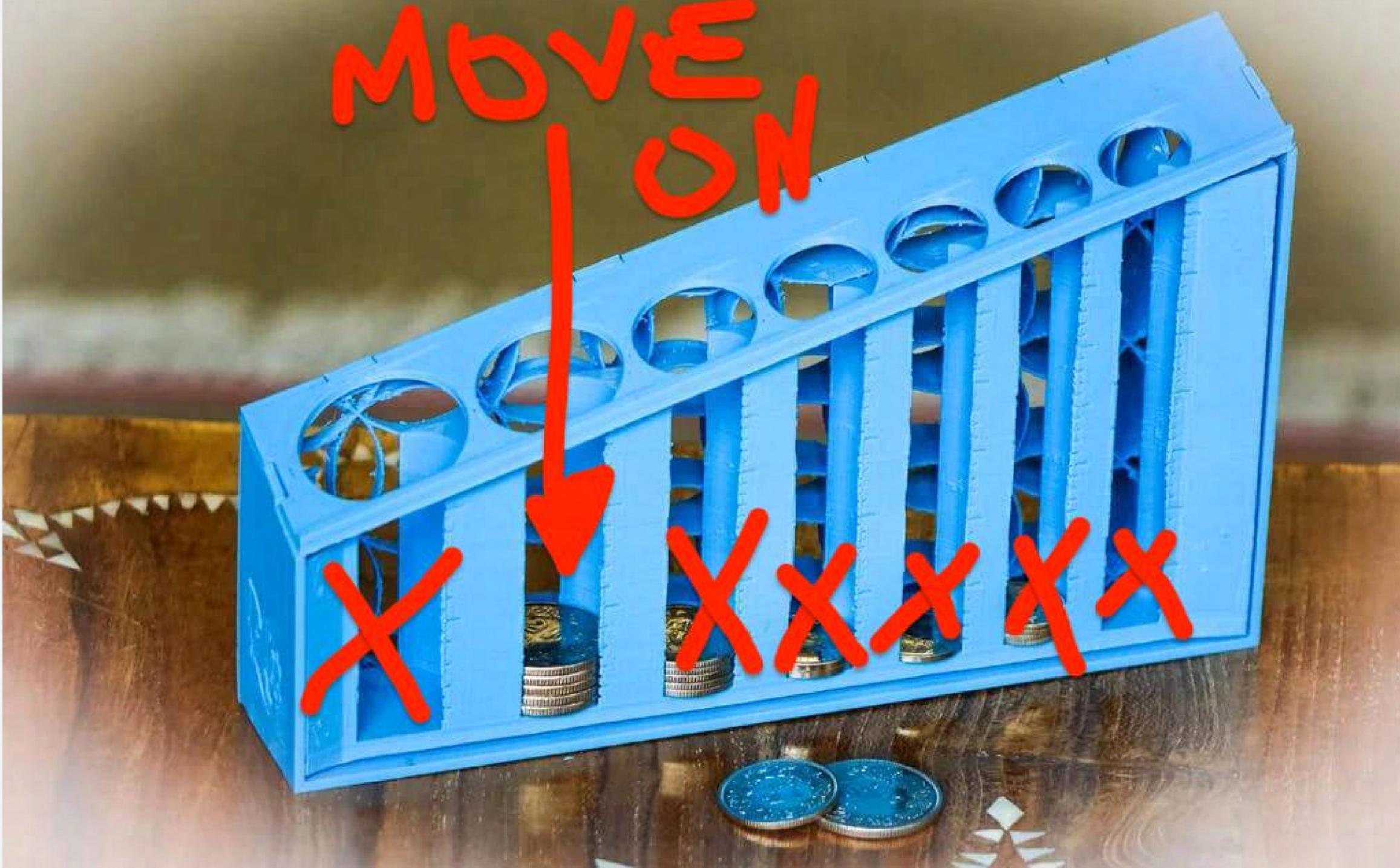
**Cascading filters out  
Inheritance fills in**



A black and white photograph of a woman singing into a vintage-style microphone. She has dark hair and is wearing a dark, sequined dress. In the background, a band is performing on stage, including a drummer and a guitarist. The lighting is dramatic, with strong highlights and shadows.

**TWO STYLES ENTER  
ONE STYLE LEAVES**







(but this time using *different metrics*)

► Origin & Importance

► (Shadow) Context

► Element-Attached Styles

► Cascade Layers (*new!*)

► Selector Specificity

► Order of Appearance

*Origins...*

# **Who Requested The Style?**



*Importance...*

**How Much Do They Care ?**

**"The user/browser specifies initial preferences..."**

- Håkon Lie



# Browser Defaults

*Officially...*



# User Agent Styles

```
body { margin: 8px; }

a:link { color: blue; }

div, section, article, p, ol, ul /* etc */ {

    display: block;

}

h1, h2, h3, h4 /* etc */ {

    font-weight: bold;

    font-size: something big I dunno;

}
```

# Cascading HTML style sheets -- a proposal

[Håkon W Lie](#)

howcome@info.cern.ch

10 Oct 1994

---

v0.92 This document describes work in progress and is incomplete as a basis for implementation. Its primary purpose is to establish guiding principles and propose a level of functionality for HTML style sheet

## Abstract

This document proposes a style sheet scheme for HTML documents. The proposed scheme provides a simple mapping between HTML elements and presentation hints. Properties like font family and window s

The style sheet scheme is designed so that style sheets can be cascaded; the user/browser specifies initial preferences and hands the remaining influence over to the style sheets referenced in the incoming docum

The scheme supports visual as well as non-visual media.

## Introduction

Style sheets are a part of the web today. Browsers, especially the GUI variants, support ways for the user to specify presentation parameters like fonts and colors. There are several reasons why the current funct

- current style sheets are static, they seldom change within the lifetime of a browser process. This makes the visual environment sparse.
- current style sheets are implemented using platform-specific notations, e.g. X11 resources. While some may consider this to be a feature, it prohibits general mechanisms for passing styles over the web.
- the author of HTML documents has no influence over the presentation. Indeed, if conflicts arise the user should have the last word, but one should also allow the author to attach style hints.

The last point has especially been a source of much frustration among professions that are used to be in control of paper-based publishing. This proposal tries to soften the tension between the author and the rea

- a) giving readers a richer visual (or auditory and tactile) environment while they retain control if necessary, and
- b) providing authors and publishers with stylistic influence without resorting to page description languages.

The proposed scheme is balanced in the sense that it provides author and reader with the same notation for specifying style. While the author (or publisher) often wants to give the documents a distinct look and

## The cascade

The proposed scheme supplies the browser with an ordered list (cascade) of style sheets. The user supplies the initial sheet which may request total control of the presentation, but -- more likely -- hands most of

```
<LINK REL="style" HREF="http://NYT.com/style">
```

The LINK element is used to indicate the URL of the style sheet. Multiple style sheets can be referenced from the same document, and will be appended to the cascade and merged as they are encountered.

Style sheets can reference other style sheets, and the cascade can be infinitely long. Programs will have to limit the length of the cascade. Fetching and processing the cascade is potentially expensive, but cacheing

10 Oct 1994 v0.92 This document describes work in progress and is incomplete as a basis for implementation. Its primary purpose is to establish guiding principles and propose a level of functionality for HTML style sheets. Comments are solicited. Abstract This document proposes a style sheet scheme for HTML documents. The proposed scheme provides a simple mapping between HTML elements and presentation hints. Properties like font family and window size can be suggested by the style sheet, and it can also provide logic to make presentation decisions based on the user's environment; e.g. the size of the screen or the current date. The style sheet scheme is designed so that style sheets can be cascaded; the user/browser specifies initial preferences and hands the remaining influence over to the style sheets referenced in the incoming document. This will provide publishers with stylistic influence without resorting to page description languages. The scheme supports visual as well as non-visual media. Introduction Style sheets are a part of the web today. Browsers, especially the GUI variants, support ways for the user to specify presentation parameters like fonts and colors. There are several reasons why the current functionality is not sufficient: current style sheets are static, they seldom change within the lifetime of a browser process. This makes the visual environment sparse. current style sheets are implemented using platform-specific notations, e.g. X11 resources. While some may consider this to be a feature, it prohibits general mechanisms for passing styles over the web. the author of HTML documents has no influence over the presentation. Indeed, if conflicts arise the user should have the last word, but one should also allow the author to attach style hints. The last point has especially been a source of much frustration among professions that are used to be in control of paper-based publishing. This proposal tries to soften the tension between the author and the reader by: a) giving readers a richer visual (or auditory and tactile) environment while they retain control if necessary, and

b) providing authors and publishers with stylistic influence without resorting to page description languages. The proposed scheme is balanced in the sense that it provides author and reader with the same notation for specifying style. While the author (or publisher) often wants to give the documents a distinct look and feel, the user will set preferences to make all documents appear more similar. Designing a style sheet notation that fill both groups' needs is a challenge. The cascade The proposed scheme supplies the browser with an ordered list (cascade) of style sheets. The user supplies the initial sheet which may request total control of the presentation, but -- more likely -- hands most of the influence over to the style sheets referenced in the incoming document. <LINK REL="style" HREF="http://NYT.com/style"> The LINK element is used to indicate the URL of the style sheet. Multiple style sheets can be referenced from the same document, and will be appended to the cascade and merged as they are encountered. Style sheets can reference other style sheets, and the cascade can be infinitely long. Browsers will have to limit the length of the cascade. Fetching and processing the cascade is potentially expensive, but caching will reduce the cost. Some simple examples Rather than providing a formal definition of the style sheet language, this proposal includes examples that indicate where work in progress is heading. The concepts of cascading and weighted influence is more important than the specific list of style values that can be set. (A reasonable list of such parameters can be found in Robert Raisch's stylesheet proposal). A one-statement style sheet that sets the font size of the h1 element: h1.font.size = 24pt 100% The percentage at the end of the line indicates what degree of influence that is requested (here 100%). If this is the initial style sheet (i.e. the one under user control), this request can be fulfilled, i.e. all headline elements will be rendered using helvetica. If the statement comes in a later style sheet, any unclaimed influence is granted. h2.font.size = 20pt 40% Here, the requested influence is reduced to 40%. If a style sheet later in the cascade also requests influence over h2.font.size, up to 60% can be granted. When the document is rendered, a weighted average of the two requests is calculated, and the final font size is determined. 30% h1.font.family = times This stylesheet first requests a default influence of 30% which is applied to all following statements unless otherwise specified. This leaves 70% of the influence to upcoming style sheets which may set other values. For continuous values, e.g. the font size, mixing influences is not problematic -- one simply calculates the weighted average if they differ. For discrete values, e.g. the font family, it may not be obvious how to mix 40% helvetica and 60% times. Some will argue that font families certainly can be parameterized and mixed, others that one should select the request with the highest influence. The issue deserves more research for which this proposal leaves room. 40% font.family = times h1.font.family = helvetica 100% The first statement sets the font family of all elements to times. An alternative syntax using well-known wildcard symbols is \*.font.family = times. The second statement overrides the font family value for the h1 element and requests absolute control (100%) for this. The order of the two statements above is irrelevant -- the more specific statements will override the more general ones. 60% AGE > 3d ? background.color = pale\_yellow : background.color = white DISPLAY\_HEIGHT > 30cm ? http://NYT.com/style : http://LeMonde.fr/style In this example, parameters from the user's environment is taken into account when determining the style sheet values. The C-style syntax of the first statement reads: If the document is older than three days, the background color should be pale yellow, else the background color should be white. The second statement references other style sheets. If the height of the display is less than 30 cm, the NYT style will inherit the remaining influence, otherwise the LeMonde style will be given these rights. RELEVANCE > 80 ? h1.font.size \*= 1.5 In newspapers, the size of the headlines tell us how important the editor believes the article is. As digital agents and personalized information filters become available, the typography of HTML documents should also be influenced by the relevance of each document for each individual user. Given a relevance factor, the above statement multiplies the font size of h1 by 1.5. http://NYT.com/style 30% http://LeMonde.com/style 70% This style sheet sets no parameters of its own. Instead, it references two other sheets and assigns them different weights. If no previous style sheets has claimed influence, the resulting presentation will be a mix of NYT (30%) and LeMonde (70%). speech.\*.weight = 35db speech.em.weight = 40db Current browsers consider the computer screen to be the primary presentation target, but HTML -- different from the page description languages -- has the potential of supporting many output media, e.g. paper, speech and braille. Each medium has its own characteristics which may require different presentation parameters to be set. The example above sets values for the speech medium. while all previous statements by default set values for all media. align.style = left head.align.style = center print.head.align.style = right Both HTML elements and media types have been grouped to allow for more general statements. In the above example, the first statement establishes a default left alignment for all elements in all media. The second statement changes the setting for headline elements (h1 .. h6) in all media. The last statement is more specific; it requests headlines to be right-aligned when printed. print is itself a group consisting of e.g. print\_color and print\_mono. font.size \*= 2 100% This single statement style sheet will, if given the influence, double the font size of all paragraphs. A style sheet like this could conveniently be merged in when the user selects "double font size" from a pulldown menu. One could easily duplicate the functionality of e.g. Mosaic's font options this way. Also, one can imagine far more powerful user interfaces that takes into account the advantages of cascading style sheets: User Author Font o-----x-----o 64% Color o-x-----o 90% Margin o-----x-----o 37% Volume o-----x-----o 50% Here, x represents the handles of slide bars. The output of this interaction is the percentage values that are attached to the statements in the user's style sheet. Unresolved issues LINK elements are only allowed in the HEAD of the document. There should be a way of adding and subtracting style sheets from within the document. This would allow for the nesting of style sheets within a document. In its finest resolution, the current notation attaches style values to one HTML element. There should also be a way to specify style settings for attributes. The order of the statements in the style sheets is irrelevant; the more specific ones override the more general ones. A precise definition of the rules for this is needed. E.g., wwhich is the more general among print.head.font.size = 20pt and h1.font.size = 14pt. Limitations In order to keep the complexity low for both the style sheet writers and the browser programmers, the proposed scheme has many limitations. While a style sheet may look like a procedural program, it lacks many of the constructs of traditional programming languages, e.g.: compound statements, variables, and/or. Rather, the style sheets are declarations of constraints. Much due to the above point, some seemingly normal statements will not be allowed. Notably, all conditional statements must be resolved when the style sheet is read. The statement h1.font.size > 20pt ? h2.font.size = 15pt is illegal since the value of h1.font.size is allowed to change. Statements can not be granted groupwise influence. E.g., one cannot specify that statement A should always have the same influence as statement B. The notation is quite verbose. Fetching and parsing a cascade of complex style sheets is potentially expensive. Caching will reduce the cost. Implementation An implementation of the proposed scheme is planned. Most of the code can and should be put into the common code library so that browsers easily will be able to support style sheets. Acknowledgement The author wishes to thank Dave Raggett, Phill Hallam-Baker and Tim Berners-Lee for fruitful discussions. Also, Robert Raisch's earlier stylesheet proposal has been influential. All errors are my own. Appendix A A more complex example # # This is an initial style sheet. It should provide fallback values # with low influence. Also, at the end, the user has added some # favorite settings # 0% # 0% impact, i.e. fallbacks # first, set some common defaults font.family = times font.size = 12pt # alternative units are px, mm, cm font.slant = normal font.weight = normal h1.font.size = font.size \* 3 h2.font.size = font.size \* 2.5 h3.font.size = font.size \* 2 strong.font.weight = bold em.font.slant = italics tt.font.spacing = proportional align.style = left # paragraph alignment h1.align.style = center space.left = 0pt # set the white space surrounding paragraphs space.right = 0pt space.above = 4pt space.below = 4pt space.first = space.left + 0.5cm # i.e. some extra indentation head.space.above = 15pt # straying from the 4pt default above list.space.left = 1cm # extra indentation for all lists list.space.first = 1cm # window-wide settings AGE > 3d ? window.background = pale\_yellow : window.background = white window.foreground = black window.width = 400px window.height = REAL\_HEIGHT - 50px window.margin.left = 2cm window.margin.right = 2cm window.margin.above = 2cm window.margin.below = 2cm # # paper works different # print.font.size = 10pt # # The user has redefined some of the default values below # 100% # first, redefine influence to dictatorship font.family = helvetica # after this, the rest of the influence is handed over to the style # sheets of the incoming documents # slides



# User Styles

Establish desired *preferences*

 General Home Search Privacy & Security Sync More from Mozilla

## Language and Appearance

## Website appearance

Some websites adapt their color scheme based on your preferences. Choose which color scheme you'd like to use for those sites.



Manage Firefox Developer Edition themes in [Extensions & Themes](#)

## Colors

Override Firefox Developer Edition's default colors for text, website backgrounds, and links.

[Manage Colors...](#)

## Fonts

Default font

Default (Times)

▼

Size

16

▼

[Advanced...](#)

## Zoom

Default zoom

100%

▼

 Zoom text only Extensions & Themes Firefox Developer Edition Support



# Author Styles

# Cascade Origins

1.  **User Agent** (goes first)
2.  **User** (override browser)
3.  **Author** (most powerful)



**"If conflicts arise the user should have the last word..."**

– Håkon Lie

*Why we have...*

**!importance**



!important *mirror universe*



81/249

1. !  Author **Important** (goes first)
2. !  User **Important** (override authors)
3. !  User Agent **Important** (most power)

1.  User Agent Defaults
2.  User Preferences
3.  Author Styles
4.  Author **Important**
5.  User **Important**
6.  User Agent **Important**



► Origin & Importance

► (Shadow) Context

► Element-Attached Styles

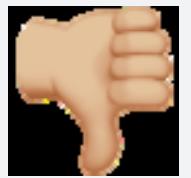
► Cascade Layers (*new!*)

► Selector Specificity

► Order of Appearance

*The purpose of...*

**!importance**



# **Authors Override Styles**



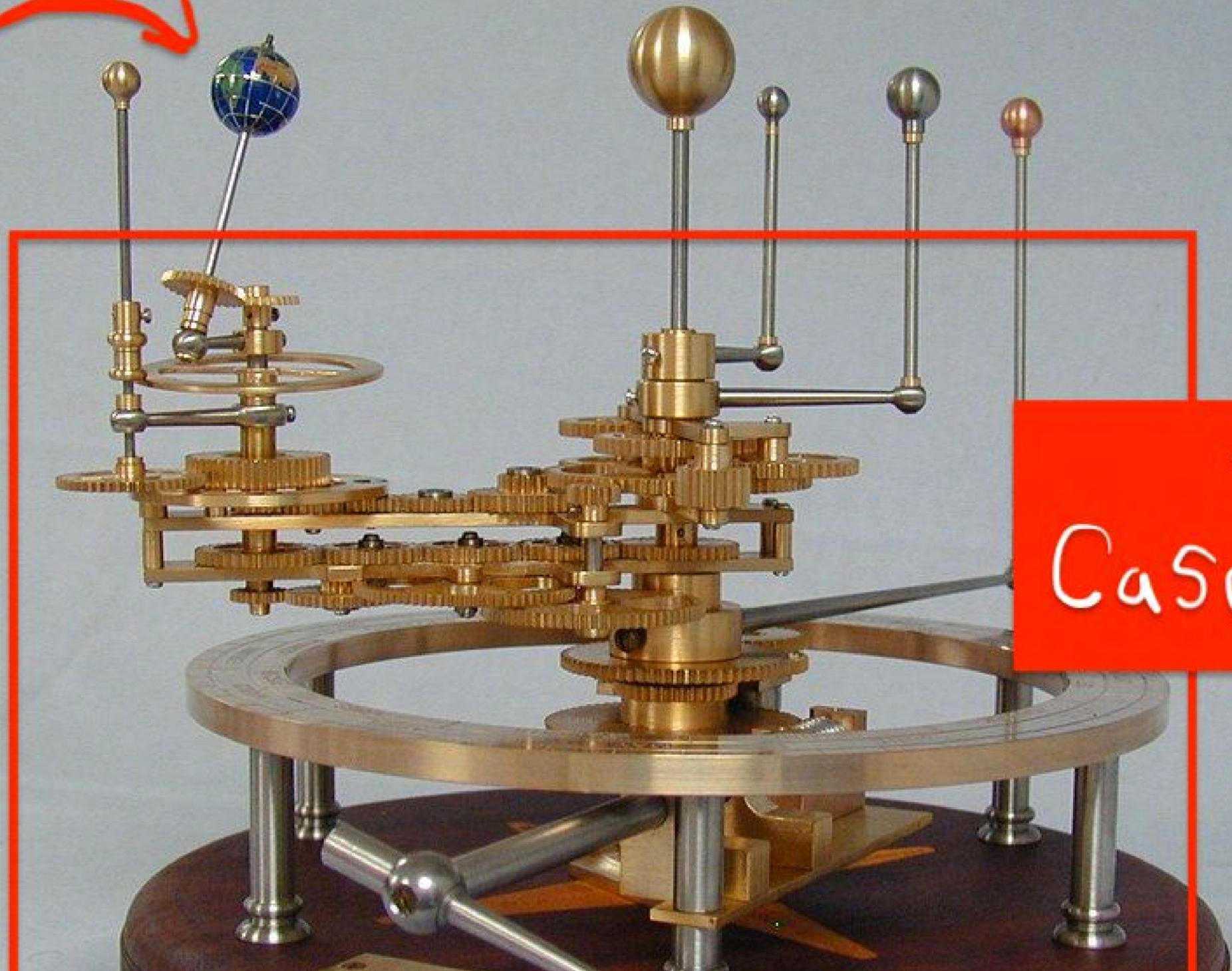
**Users Protect Styles**

# Often Isolated

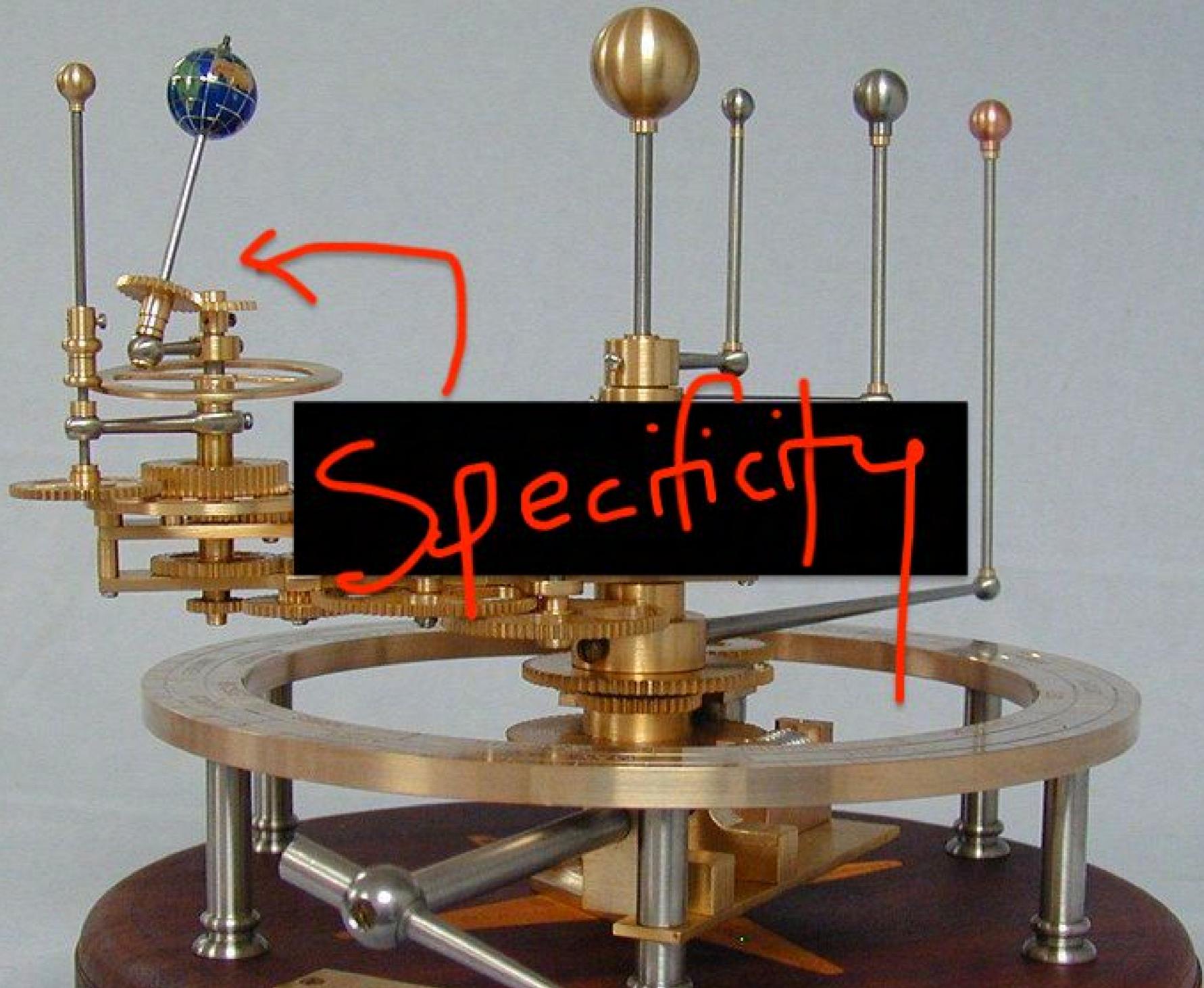
1. ...
2. ...
3.  Author Styles
4.  Author Important
5.  ...
6.  ...



VS



The  
Cascade



► Origin & Importance

► (Shadow) Context

► Element-Attached Styles

► Cascade Layers (new!)

► Selector Specificity

► Order of Appearance

*(out of order...)*

# **css Selectors & Specificity**

# Dealing With Selectors

```
.this-is a.selector {  
    /* declarations: here; */  
}
```

# **How Specific ?**

# Denver

October 10–12, 2022

Capacity is limited — Register Now!



## Set yourself apart.

An Event Apart Denver is a three-day conference with an intense focus on digital design, UX, content, code, and more, giving you deep insights into where we are now and where things are going next. Topics will include new CSS

# Denver

October 10–12, 2022

Capacity is limited — Register Now!

A stylized illustration of the Denver skyline against a backdrop of mountains. It includes the Colorado State Capitol building, a light rail train, Union Station, the Denver Art Museum, and a blue horse statue.

**Set yourself apart.**

An Event Apart Denver is a three-day conference with an intense focus on digital design, UX, content, code, and more, giving you deep insights into where we are now and where things are going next. Topics will include new CSS

# More Specific Styles

*Likely*

## More Important

# Heuristic ↗

a practical assumption that approximates the goal

*universal/type »*

# **Global Defaults**

*attrs/classes »*

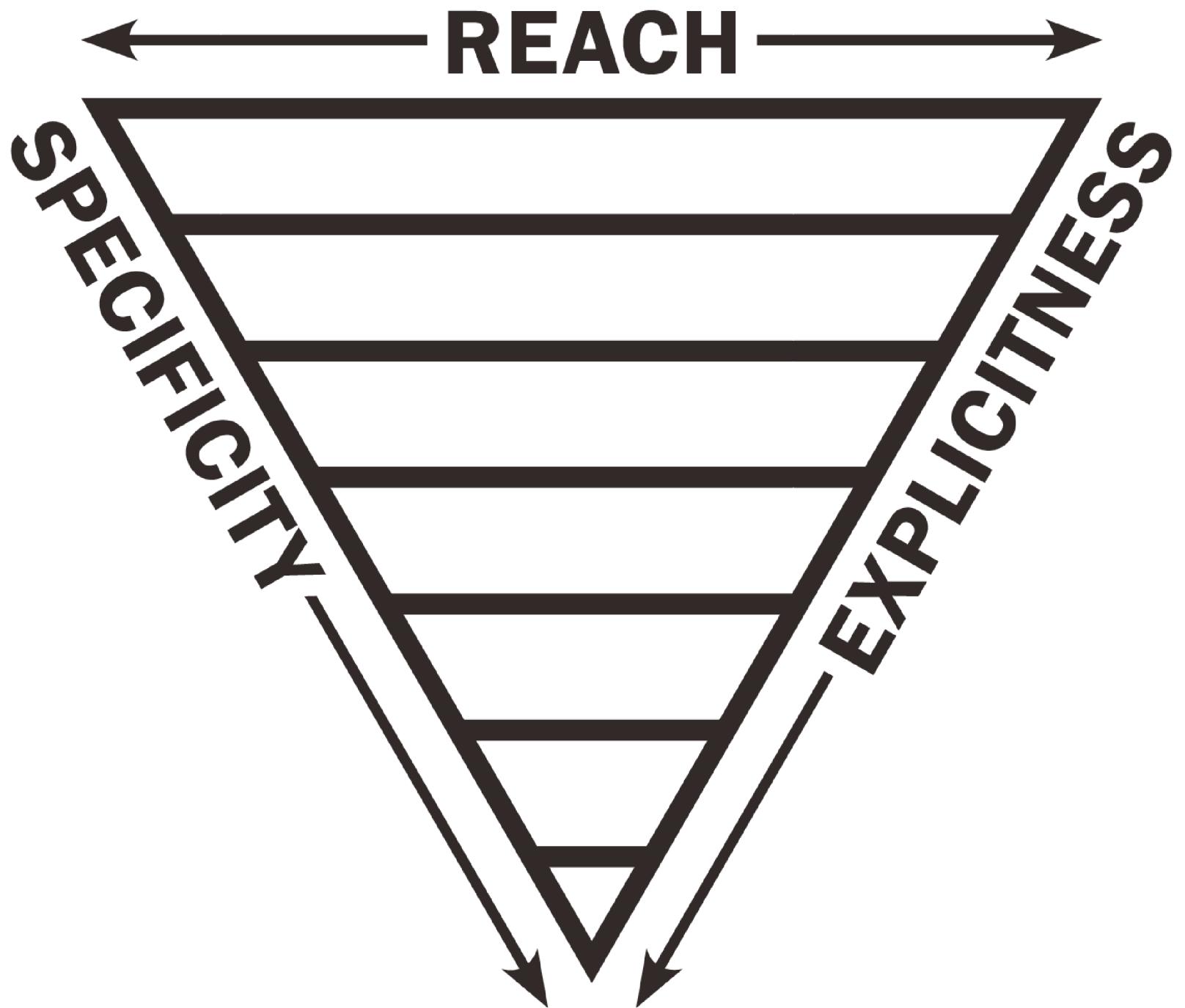
# Common Patterns

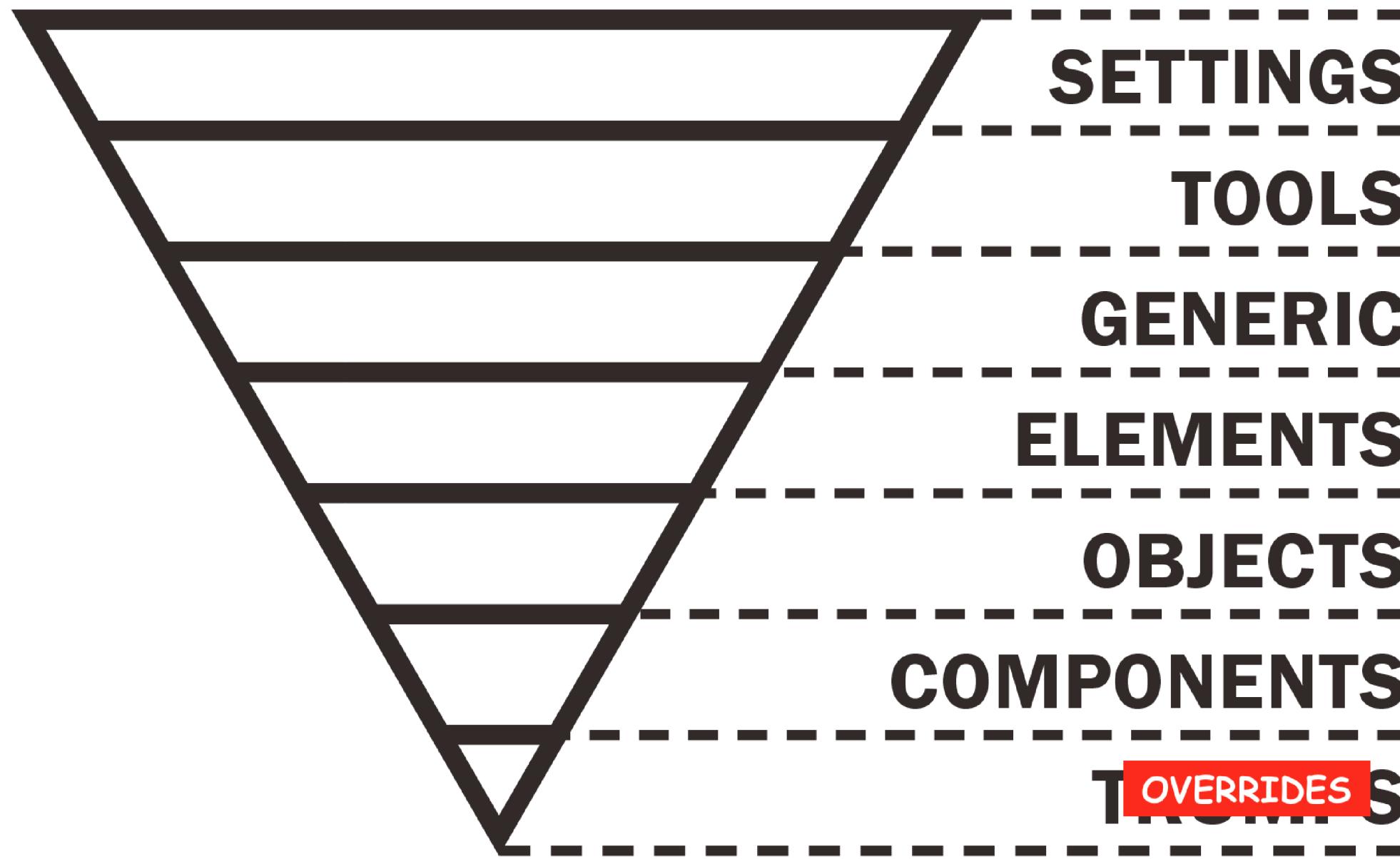
*IDs* »

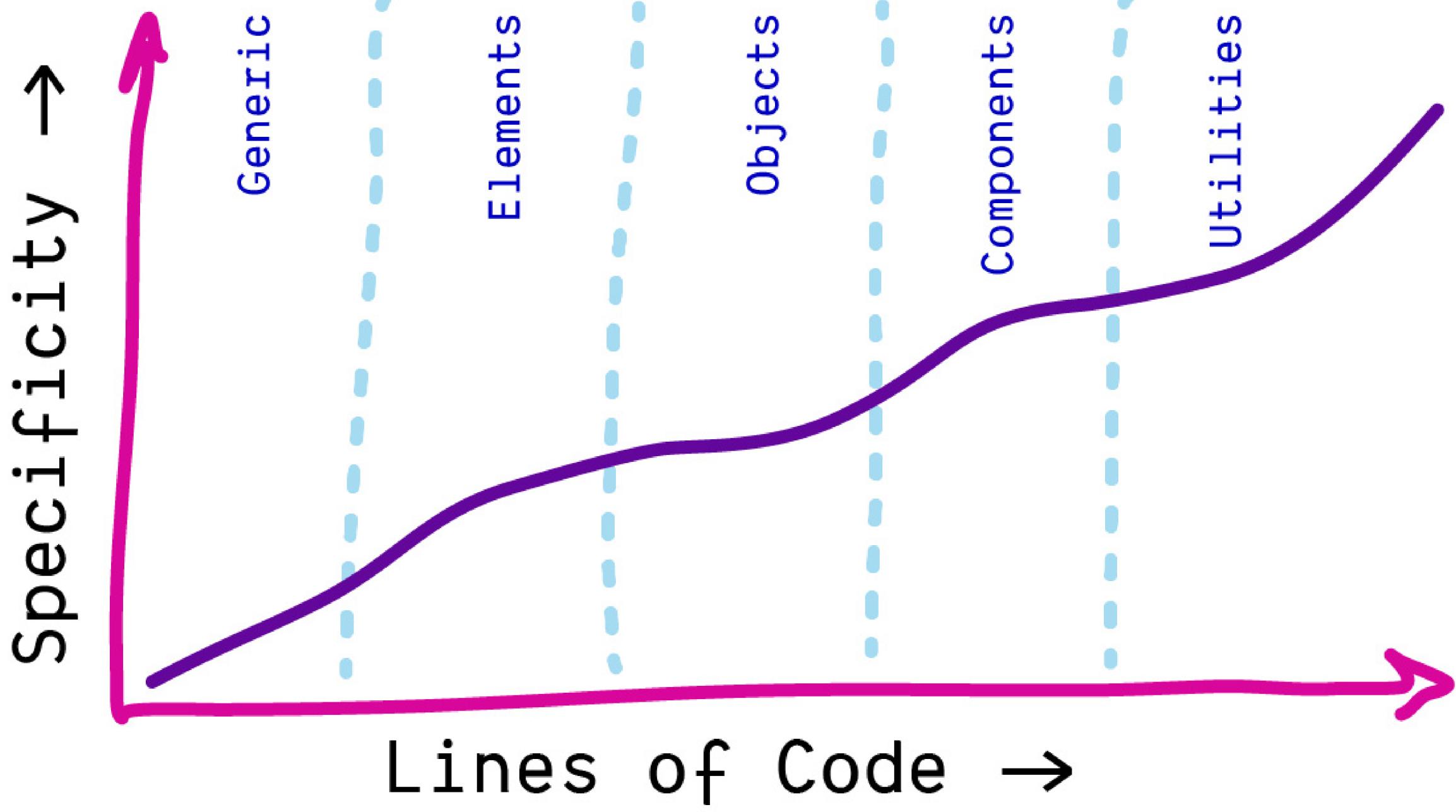
# **Singular Overrides**

# Four layers

1. *Universal* \* (go first)
2. *Element* types
3. *Reusable* .classes & [attributes]
4. *Unique* #IDs (most power)







# **Heuristics Are Assumptions**

# **Assumptions Often Fail**

Especially “**At Scale**”

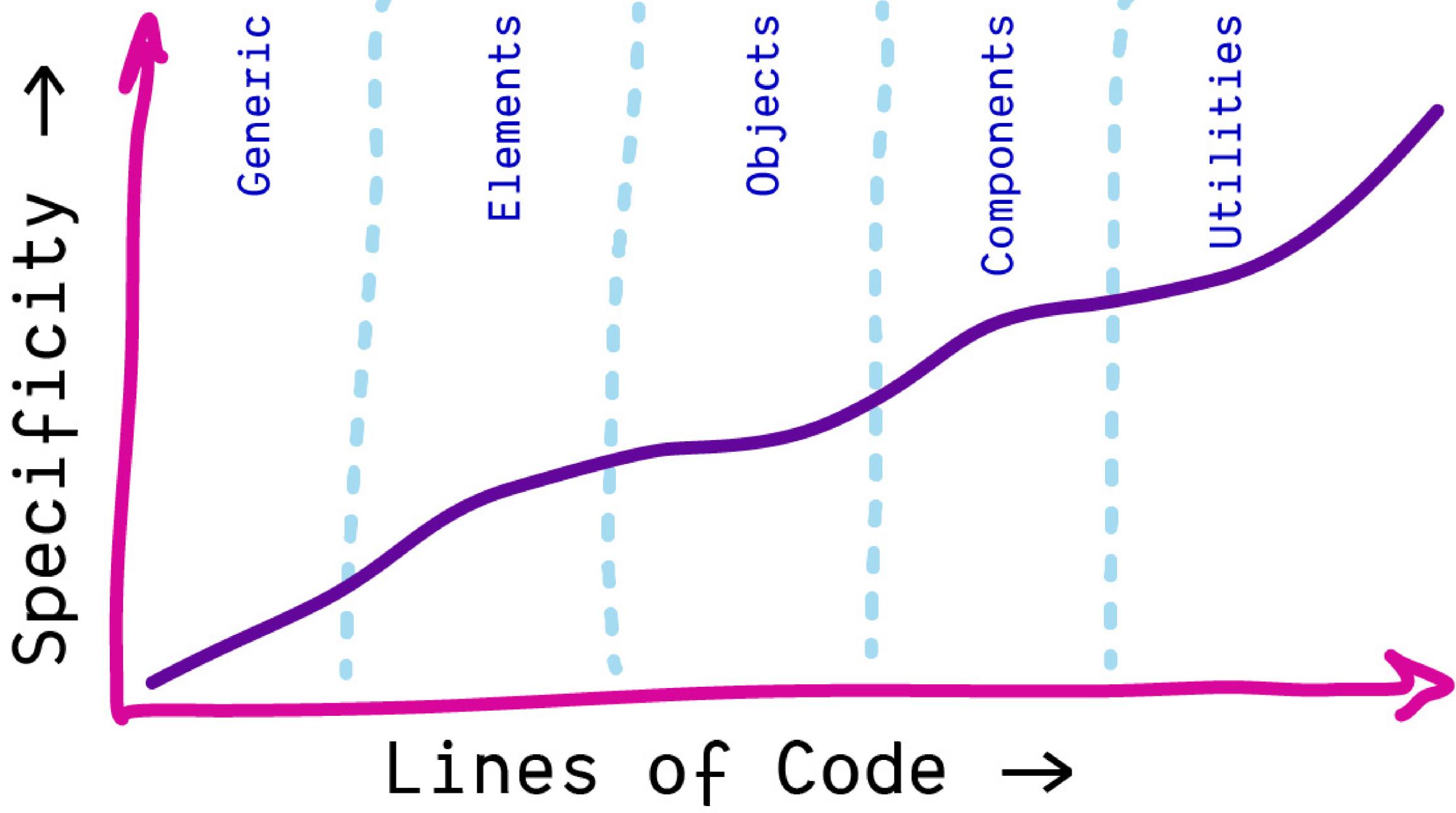
```
/* ...default table styles... */  
table[rules=cols i] > tfoot > tr > td,  
table[rules=cols i] > tfoot > tr > th,  
table[rules=all i] > tfoot > tr > td,  
table[rules=all i] > tfoot > tr > th {  
    border-color: black;  
}
```

```
[hidden] {  
    display: none !important;  
}
```

# One Flexible Layer

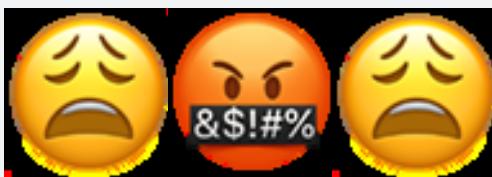
1. ~~Universal~~ \*
2. ~~Element~~ types
3. *Reusable* .classes & [attributes]
4. ~~Unique~~ #IDs

```
.block .element.modifier { /* 3 */ }
.block__element--modifier { /* 1 */ }
```

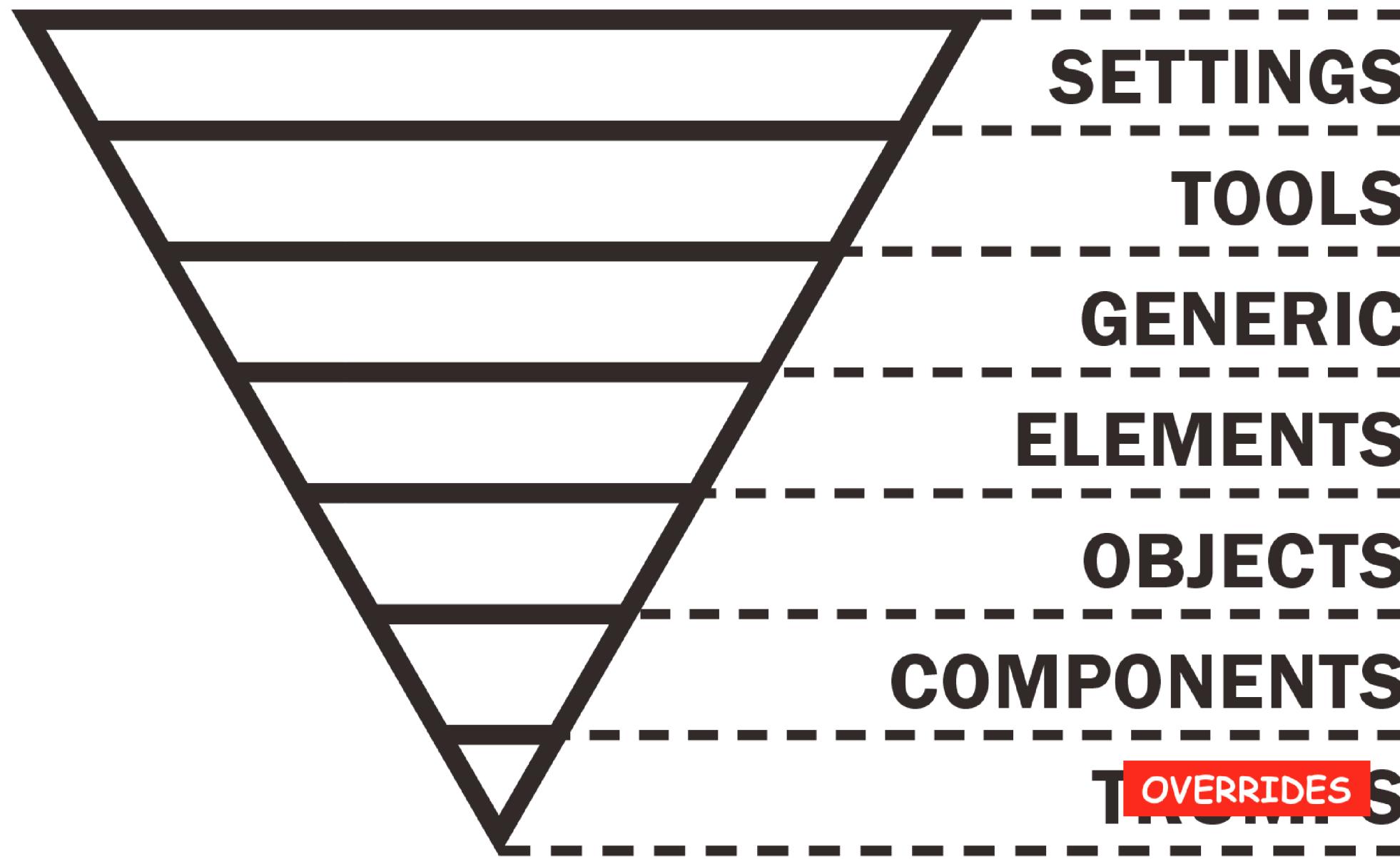


**! important**

```
.██████████-bootstrap {  
    font-weight: bold !important;  
}
```



# Cascade Layers



```
@layer settings { ... }  
@layer tools { ... }  
@layer generic { ... }  
@layer elements { ... }  
@layer objects { ... }  
@layer components { ... }  
@layer overrides { ... }
```

# Layers of *Specificity*

*player* { ... }

*@layer <name> { ... }*

```
@layer reset {  
    audio[controls] { display: block; }  
    [hidden] { display: none !important; }  
}
```

1. @layer **settings** { ... }
2. @layer **tools** { ... }
3. @layer **generic** { ... }
4. @layer **elements** { ... }
5. @layer **objects** { ... }
6. @layer **components** { ... }
7. @layer **overrides** { ... }

1. `@layer Utilities { ... }`
2. `@layer Components { ... }`
3. `@layer Themes { ... }`
4. `@layer Frameworks { ... }`
5. `@layer Resets { ... }`

*Specificity* **is Contained**

```
@layer framework {  
  #menu .dropdown .menu-item {  
    background: whitesmoke; /* ✅ specificity! */  
  }  
  
  .menu-item {  
    background: lightcyan;  
  }  
}
```

```
@layer framework {  
  #menu .dropdown .menu-item {  
    background: whitesmoke;  
  }  
}  
  
@layer override {  
  .menu-item {  
    background: lightcyan; /* ✅ layer! */  
  }  
}
```

```
@layer reset { /* least powerful */ }
@layer default { /* ... */ }
@layer theme { /* ... */ }
@layer components { /* more powerful */ }
```

*Repeated Layer Names*

# **Are Combined**

```
@layer generic {  
    audio[controls] { display: block; }  
}  
  
@layer theme { /* ... */  
  
/* still a lower layer than "theme" styles */  
@layer generic {  
    [hidden] { display: none !important; }  
}
```

```
@layer generic {  
    audio[controls] { display: block; }  
    [hidden] { display: none !important; }  
}
```

```
@layer theme { /* ... */ }
```

# **Explicit Layer Order**

Define it once, at the start

*@layer <name>, <name>, <etc>;*

```
/* establish layer order */
@layer one, two, three;

/* add code to layers as needed */
@import url(two.css) layer(two);
@layer three { ... }
@layer one { ... }
@layer two { ... }
```

*Unlayered styles*

**Default Highest Priority**

**Not Adding ! importance**

# Managing !importance

```
@layer reset, components, utilities;  
2.1 @import url(vendor-1.css) layer(components)  
  
1.1 @import url(vendor-2.css) layer(reset)  
  
1.2 @import url(vendor-3.css) layer(reset)  
  
3.1 @layer utilities { ... }  
  
4.1 /* unlayered ... */  
  
1.3 @layer reset { ... }  
  
2.2 @layer components { ... }  
  
1.4 @layer reset { ... }  
  
2.3 @layer components { ... }
```

# More Cascade Control

# **Fewer Hacks**

*Language Heuristics*

# **Don't Boss Us Around**

## CSS Cascade Layers

The `@layer` at-rule allows authors to explicitly layer their styles in the cascade, before specificity and order of appearance are considered.

IE	Edge	Firefox	Chrome	Safari	iOS Safari	Opera Mini	Chrome for Android	Android Browser	Samsung Internet
9	104	103	104	15.5	15.5			4.4	16.0
10	105	104	105	15.6	15.6			4.4.4	17.0
11	106	105	106	16.0	16.0	all	105	105	18.0
			106	107	16.1	16.1			

✓ ✗ Partial Support

Global: 88.58% + 0% = 88.58%



▶ Light/Dark

Work Services Tools Resources About Contact

## @csstools/postcss-cascade-layers

1.0.3 • Public • Published 16 days ago

 Readme

 Explore BETA

 2 Dependencies

 2 Dependents

 4 Versions

# PostCSS Cascade Layers



Install

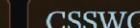
> npm i @csstools/postcss-cascade-layers

Repository

<https://github.com/csstools/postcss-plugins>

## Cascade Layers – There's a Polyfill for That!

by [Sana Javed](#) on June 21, 2022

 Article  Cascade Layers  CSS  CSSWG

Cascade layers are an exciting new addition to the CSS specification. A newly released polyfill now provides even greater browser support for

*Start with*  
**A Layer Order**

```
/* add as the first styles */
@layer reset, framework, components, utilities;
```

```
<style> /* keep this before linked styles */  
@layer reset, framework, components, utilities;  
</style>  
<link rel="stylesheet" href="#">  
<link rel="stylesheet" href="#">
```

*Then Layer*

# **Third-Party\* Tools**

\*Including inter-org dependencies

*Clearly define...*

**Each Tool's Priority**

*Clearly define...*

## **Tool-Specific Overrides**

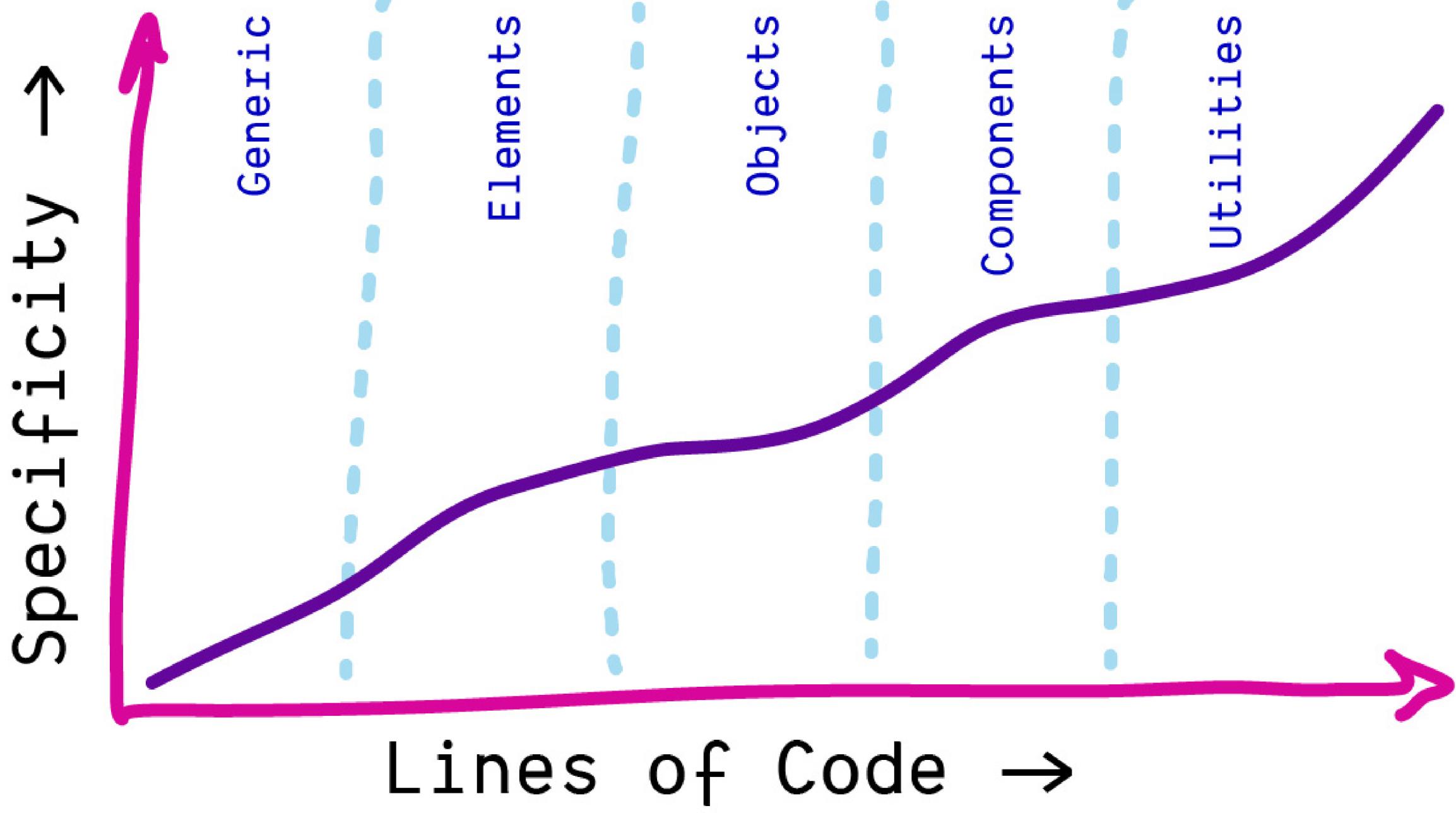
```
@import url('bootstrap.css') layer('bootstrap');

@layer bs-overrides {
    /* anything here will override bootstrap */
}
```

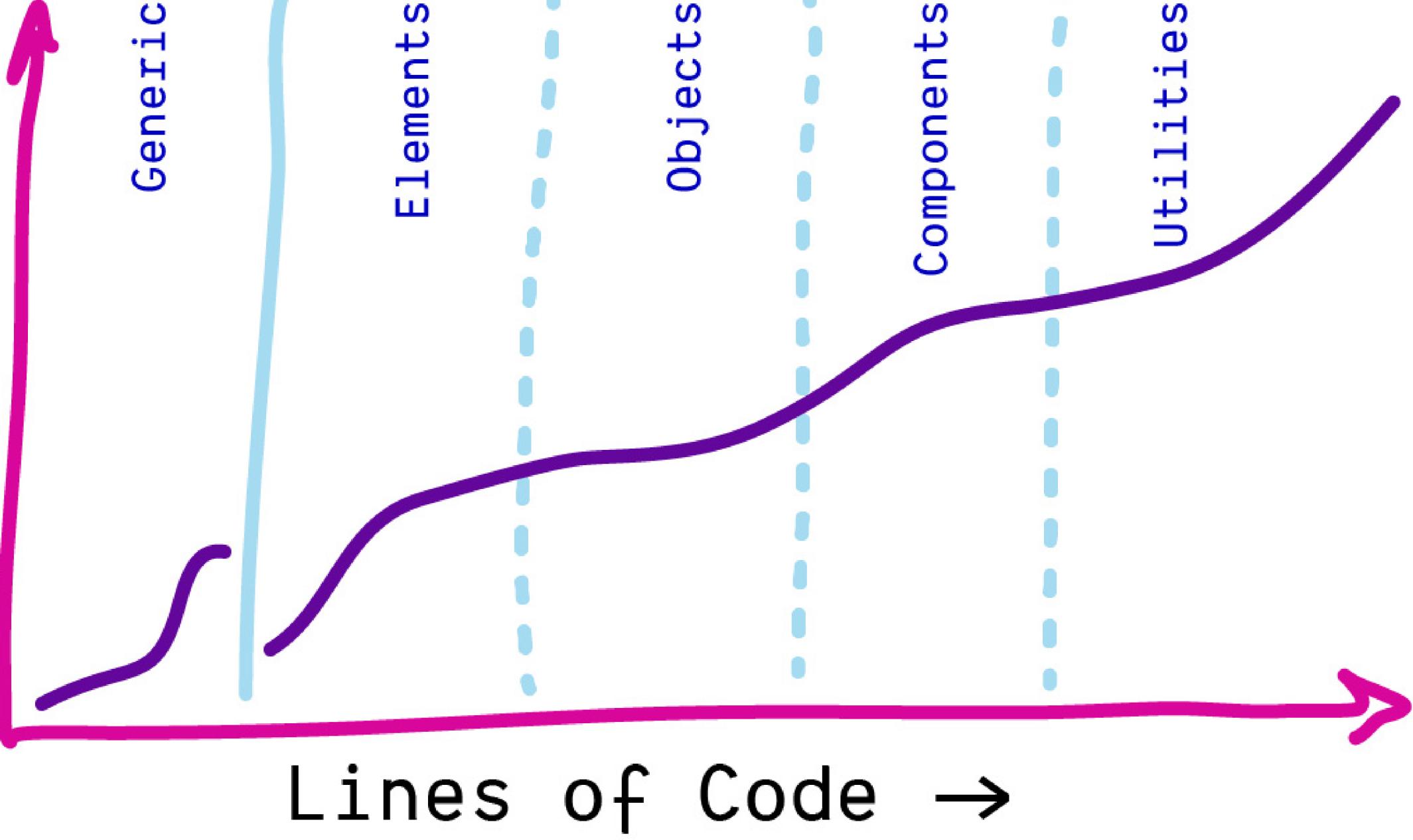
*Then Layer*

# Overall Architecture

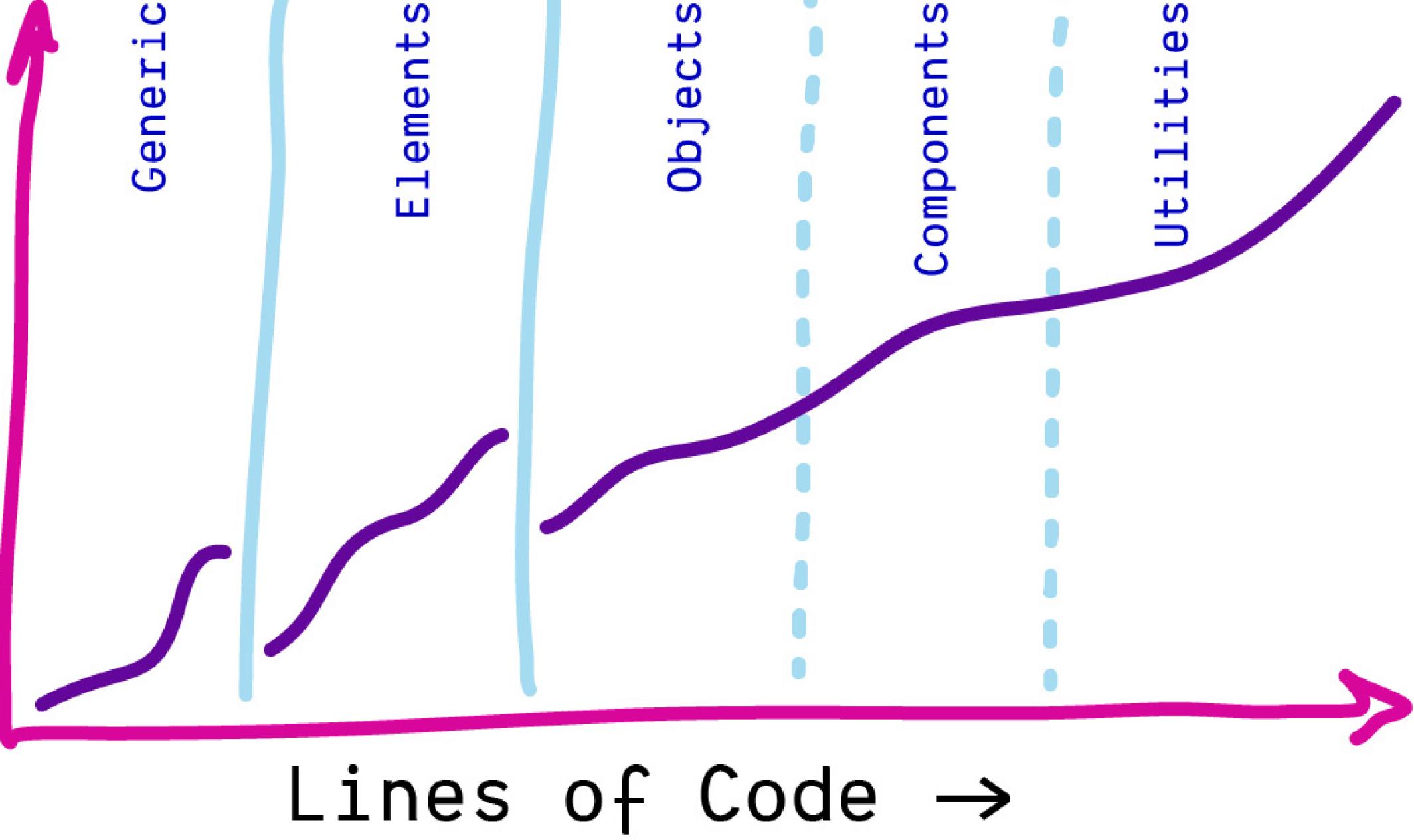
*Working from*  
**Lowest to Highest**



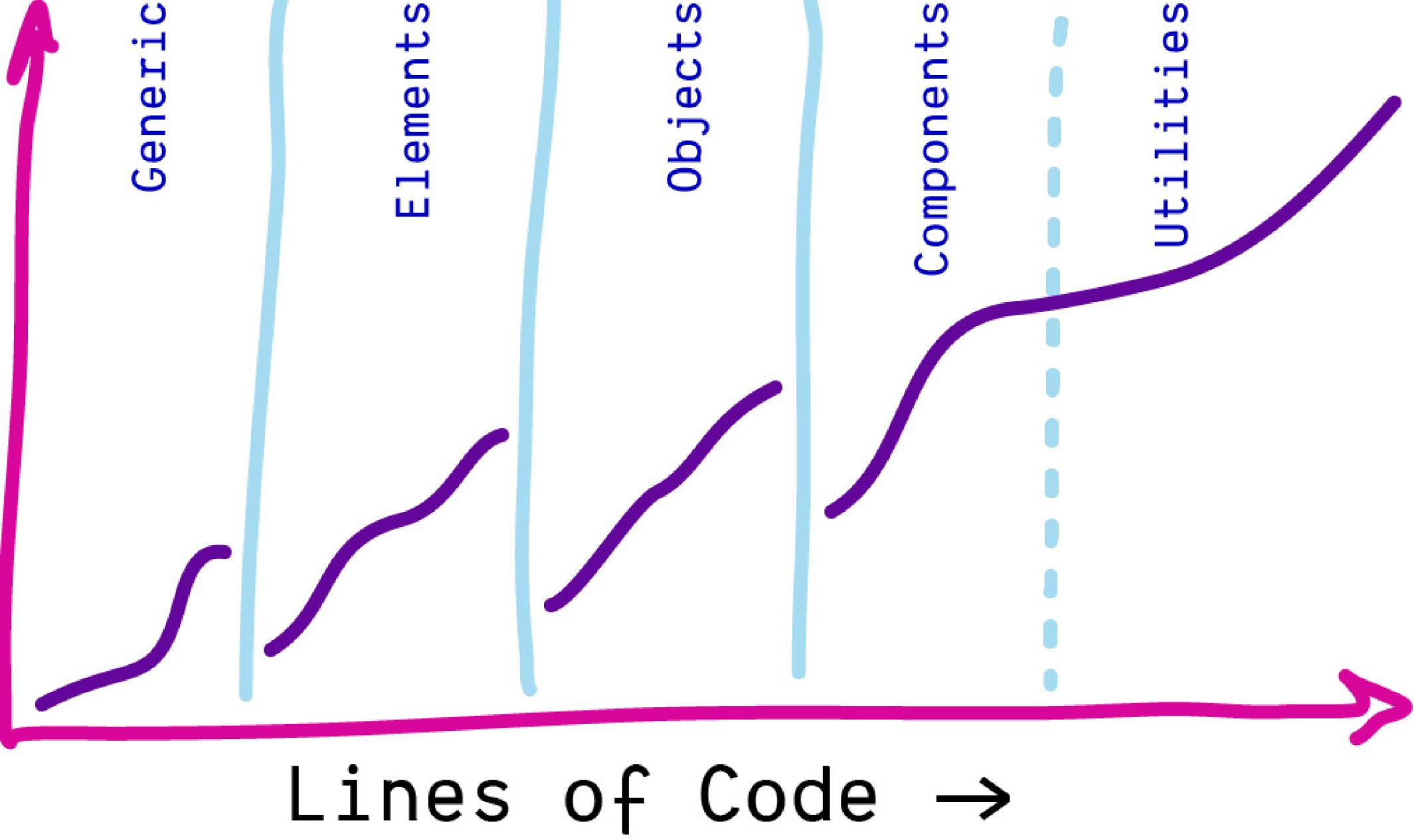
Specificity →



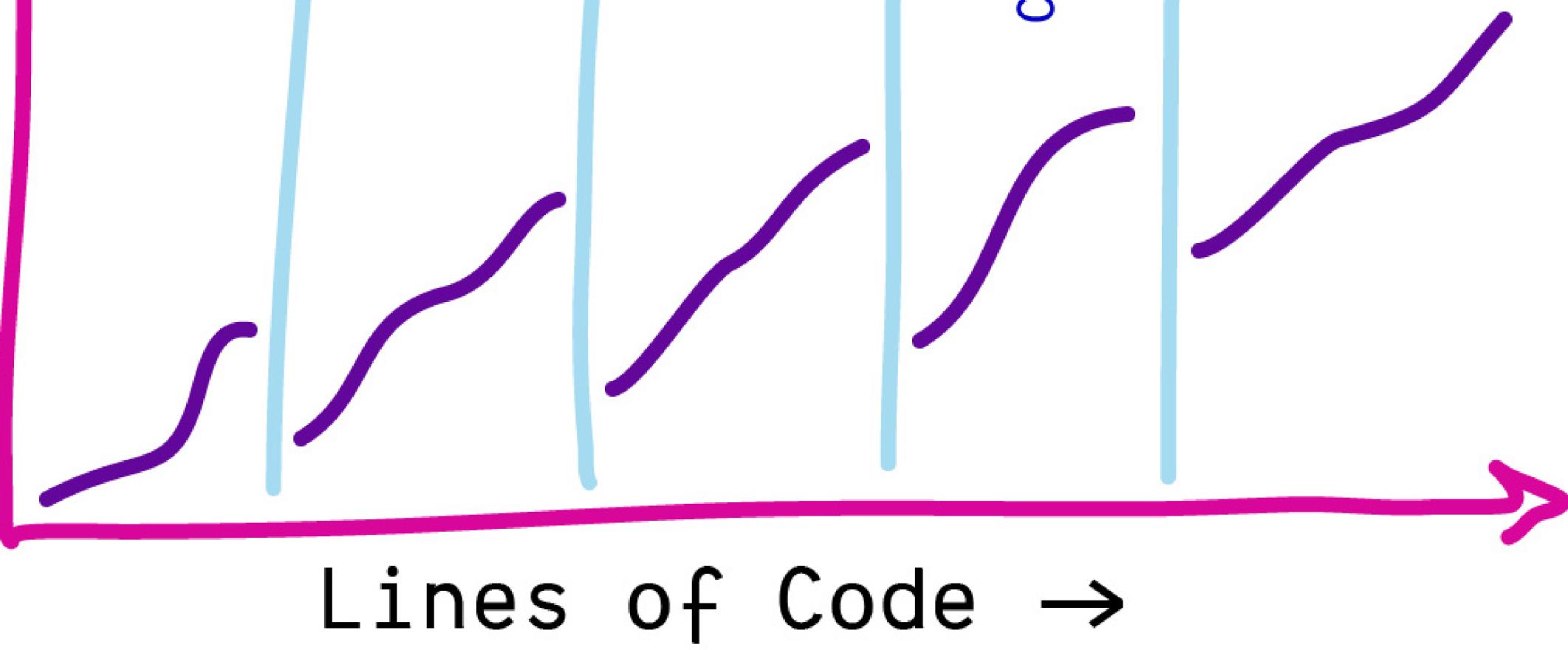
Specificity →



Specificity →



Specificity →



Generic

Elements

Objects

Components

Utilities

*At OddBird*

# Already Sass Partials

- reset/remedy
- initial
- patterns
- components
- utilities

```
@layer reset,  
    initial,  
    patterns,  
    components,  
    utilities;
```

```
@use 'reset';
@use 'initial';
@use 'patterns';
/* etc... */
```

# Can't Layer @use

```
/* ✗ */ @use 'patterns' layer(patterns);  
/* ✗ */ @layer { @use 'patterns'; }
```

*Can...*

**Load CSS From Modules**

*meta.load-css(<partial>)*

```
/* How it was without layers */
```

```
@use 'reset';  
@use 'initial';  
@use 'patterns';  
/* etc... */
```

```
@use 'sass:meta';

@include meta.load-css('reset');
@include meta.load-css('initial');
@include meta.load-css('patterns');
/* etc... */
```

```
@use 'sass:meta';

@layer reset { @include meta.load-css('reset'); }
@layer initial { @include meta.load-css('initial'); }
@layer patterns { @include meta.load-css('patterns'); }
/* etc... */
```

# **Other Options**

a bit more verbose

# Inside Partials

```
/* patterns.scss */
@mixin css {
    /* all our css is nested */
}
```

# Using Partials

```
@use 'patterns';

@layer patterns {
    @include patterns.css();
}
```

# Inside Partials

```
/* patterns.scss */
@layer patterns {
    /* all our css is nested */
}
```

# Using Partials

```
@use 'patterns';
```

# **Single File Components**

```
/* Vue example */  
<template>...</template>  
<script>...</script>  
  
<style lang='scss'>  
@layer components {  
    /* all our component styles */  
}  
</style>
```

*For flexibility...*

**Layer Everything**

*Use unlayered for*  
**Prototyping & DeBugging**

# Nesting Layers

```
@layer components {  
    @layer state { ... }  
}  
  
/* access nested layers */  
@layer components.state { ... }
```

```
/* tools.css */
@layer theme { ... }
@layer components { ... }
```

```
@import url(tools.css) layer(tools);
```

```
@layer tools.theme { ... }
```

```
@layer tools.components { ... }
```

```
@import url(tools.css) layer(tools);  
  
@layer tools.theme { ... }  
@layer tools.components { ... }  
@layer tools.custom { ... }
```

```
@import url(bootstrap.css) layer(bootstrap.external);  
  
@layer bootstrap.local {  
    /* anything here will override bootstrap */  
}
```

```
@layer components {  
    @layer defaults, themes, state;  
}
```

*As useful,*  
**Layer Inside Components**

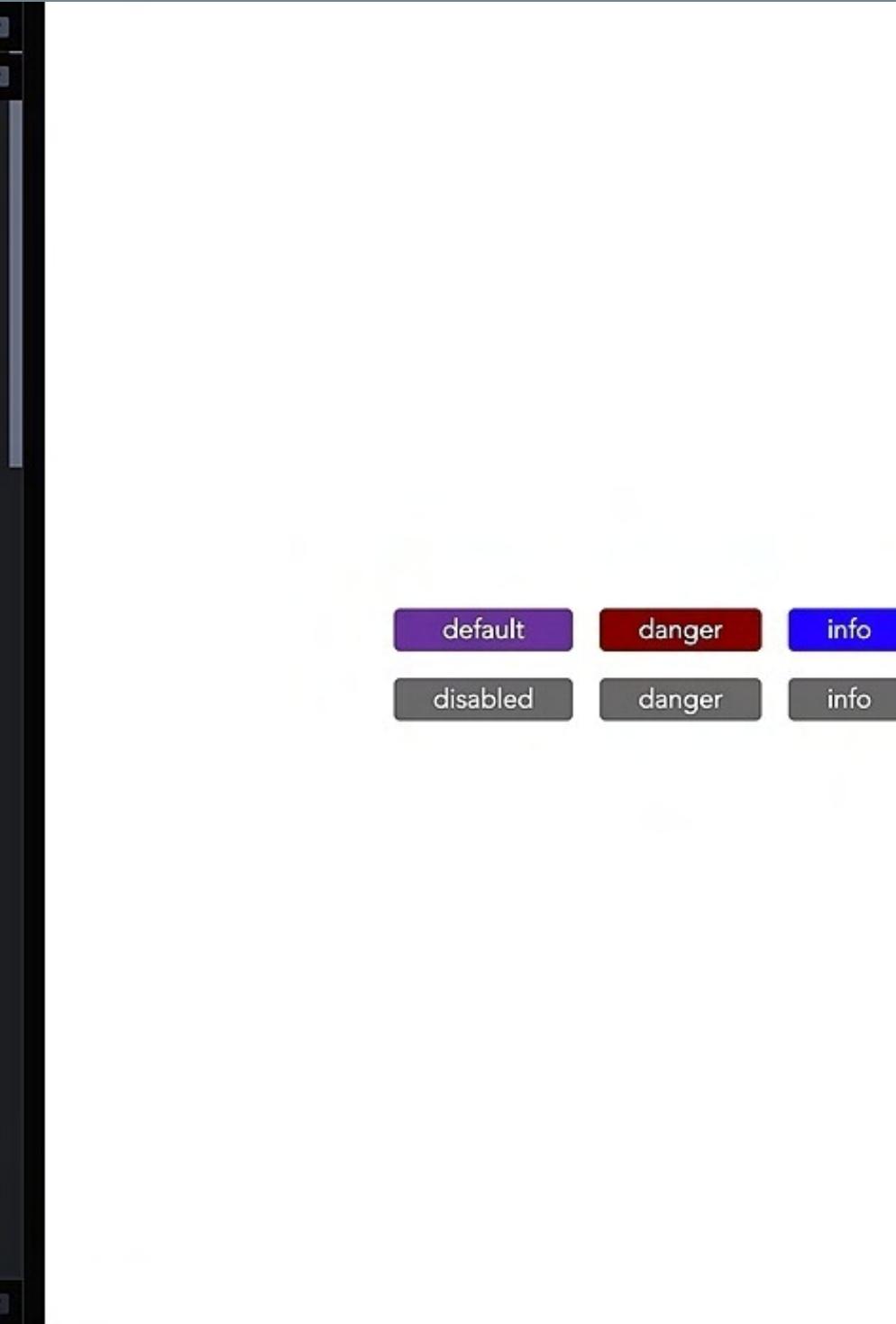
HTML

css

```
1 @layer base, theme, state;  
2  
3 @layer base {  
4   .btn {  
5     background: rebeccapurple;  
6     color: white;  
7   }  
8 }  
9  
10 @layer state {  
11   :disabled {  
12     background: dimgray;  
13   }  
14 }  
15  
16 @layer theme {  
17   .danger {  
18     background: maroon;  
19   }  
20  
21   .info {  
22     background: blue;  
23   }  
24 }
```

JS

26px Twilight (Dark Background) Console Display URL Assets



*Use layers*  
**To Provide Clarity**

*Use layers*

# To Convey Architecture

*Use layers*  
**To Describe Intent**

*Not Just...*

**'This is !important'**

*(layers lower importance by default)*

*X Overrides Y*

*Because*

*'Components' Override 'Defaults'*

*As long as*  
**The Intent is Clear**

*There's*  
**No Harm Layering**

*Not an*

**All-Or-Nothing Grenade**

*Encourages*

**Nuanced & Explicit Priorities**

*Also Not*  
**The Only Tool**

```
[id="example"] {  
    /* ID selector, class specificity */  
}
```

```
:where(#example) {  
    /* ID selector, zero specificity */  
}
```

*Still use*

**!Important As Intended**



# **Override Styles In Previous Code**

(often in *lower* layers)



# **Protect Styles From Future Code**

(often in *higher* layers)

*Like Origins,*  
**!Important Layers Reverse**

1. Resets
2. Themes
3. Components

**!important**

1. Resets
2. Themes
3. Components
4. **!Important Components**
5. **!Important Themes**
6. **!Important Resets**

*Override* -> **Layers**

*Protect* -> **Importance**

*Complete Guide to*

# **CSS Cascade Layers**

<https://css-tricks.com/css-cascade-layers/>

## CSS Cascade Layers

The `@layer` at-rule allows authors to explicitly layer their styles in the cascade, before specificity and order of appearance are considered.

IE	Edge	Firefox	Chrome	Safari	iOS Safari	Opera Mini	Chrome for Android	Android Browser	Samsung Internet
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			106	107	16.1	16.1			

✓ ✗ Partial Support

Global: 88.58% + 0% = 88.58%

**Also Coming Soon ...**

# **Scoped Styles**

*1. Avoid*

# Naming Conflicts

(across *large teams & projects*)

*2. By*

# **Expressing Membership**

(through *lower boundaries & proximity*)

# **Scope Proximity**

```
.light-theme a { color: purple; }  
.dark-theme a { color: plum; }
```

# Scope Proximity Issue

Light Theme

purple

Dark Theme

plum

Nested Light Theme

also plum???

*@scope (<root>) { /\*...\*/ }*

```
@scope (.light-theme) {  
    a { /* similar to simple nesting... */ }  
}  
  
@scope (.dark-theme) {  
    a { /* but the _closer_ scope root wins... */ }  
}
```

HTML

CSS 8 unsaved changes X

```
1 /* with scopes */
2 @scope (.light-theme) {
3   :scope {
4     background: white;
5     color: black;
6   }
7   a { color: mediumvioletred; }
8 }
9
10 @scope (.dark-theme) {
11   :scope {
12     background: black;
13     color: white;
14   }
15   a { color: lightcyan; }
16 }
17
18 @scope (html) {
19   .support { display: none; }
20 }
21
22
23 .light-theme,
24 .dark-theme {
```

JS

## Scope Proximity

The dark-theme link should be █ lightcyan

The light-theme link should be █ mediumvioletred

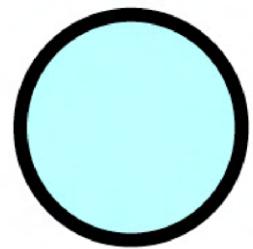
The dark-theme link should be █ lightcyan

With `@scope`, we can ensure that the 'nearer' scope wins, giving us the correct result no matter how these scopes are nested.

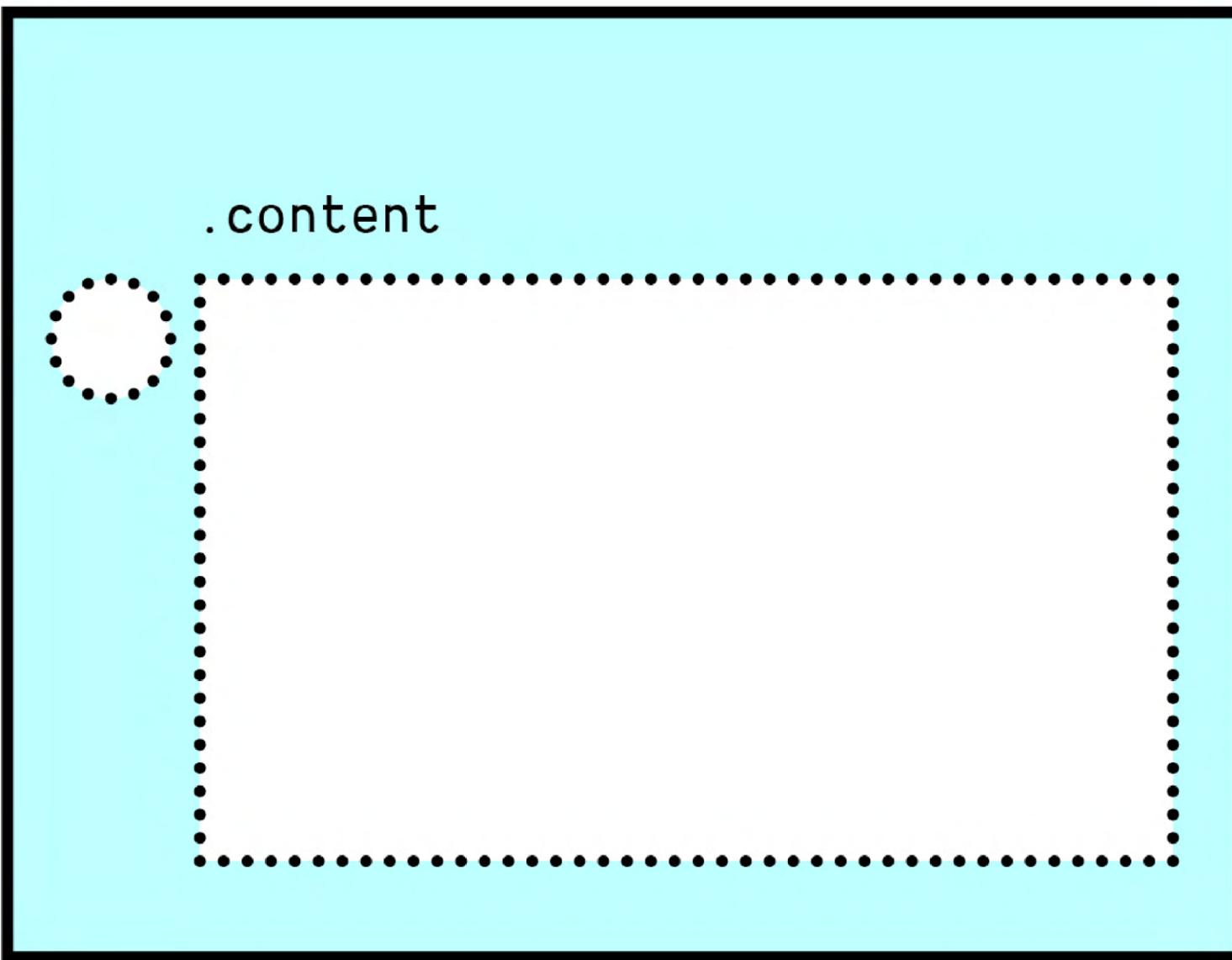
# **Scope Boundaries**

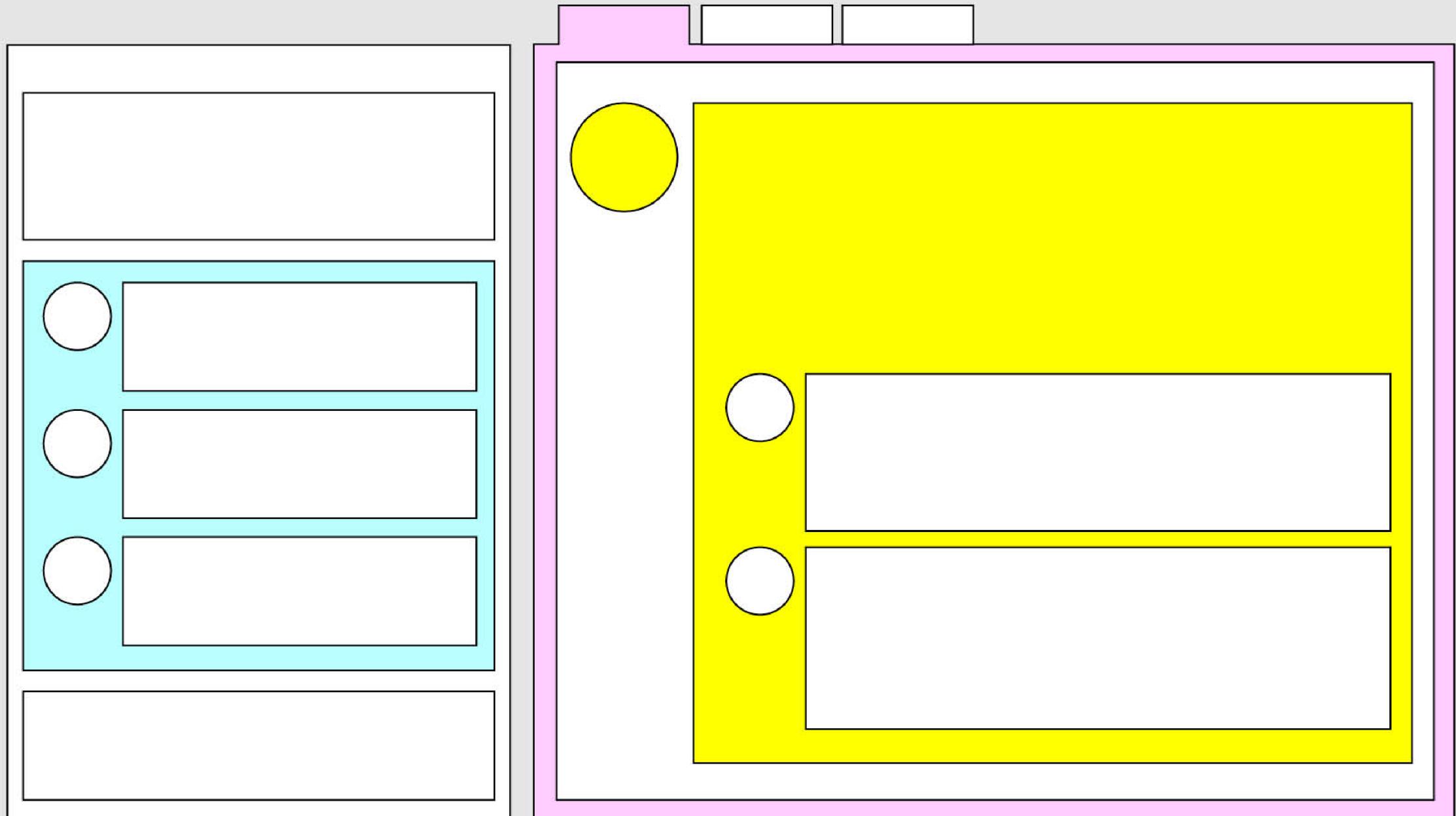
```
.title { /* global */ }  
.post .title { /* nested */ }  
  
.post__title { /* BEM */ }
```

.media



.content





*Build-tools*

## **Provide Scoped Styles**

BEM, CSS Modules, Vue, JSX, Stylable, etc

```
.post__title { /* BEM */ }
.title[data-JKGHJ] { /* Vue */ }
```

*@scope (<root>) to (<boundary>) {...}*

```
@scope (.media) to (.content) {  
    img { /* only images that are "in scope" */ }  
}
```



## HTML

## CSS

```
1 @scope (.media) to (.content) {  
2   img {  
3     border-radius: 100%;  
4   }  
5  
6   .title,  
7   p {  
8     color: rebeccapurple;  
9   }  
10  /* layout */  
11  :scope {  
12    background: lightcyan;  
13    border: medium solid;  
14    padding: 1em;  
15    display: grid;  
16    grid-template: "media content" auto / minmax(14ch, 20%) minmax(  
17      min-content,  
18      1fr  
19    );  
20    gap: 1em;  
21  }  
22  
23  
24  img {  
25    grid-area: media;  
26  }  
27  
28  .inner {  
29    grid-area: content;  
30  }  
31  
32  .content {  
33    background: white;  
34    border: medium dotted;  
35    padding: 1em;  
36  }  
37  
38  
39  img {  
40    max-width: 100%;  
41    height: auto;
```

## JS

Console Assets Comments ⚙ Keys

Last saved LESS THAN A MINUTE AGO



Delete

Add to Collection



Embed

Export

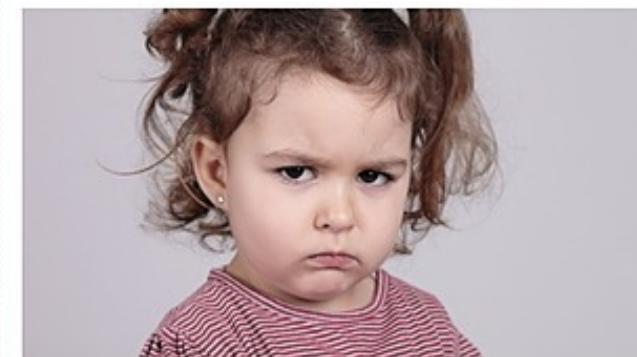
Share



## Miriam Suzanne

Lorem ipsum dolor sit amet, consectetur adipisicing elit. Ipsam soluta vel dolor veritatis, commodi exercitationem ratione aspernatur fuga iste rem officiis aut voluptatum accusantium, pariatur dicta beatae facilis nisi voluptas!

## This content is out-of-scope



Maiores exercitationem nihil magni impedit doloremque et porro dolore cumque quae. Accusamus quaerat dignissimos explicabo, quia tempore laboriosam corrupti veritatis nostrum deleniti!

HTML

CSS \* 11 unsaved changes X

```
1 /* with scopes */
2 @scope (.light-theme) to (.dark-theme) {
3   a:any-link {
4     color: mediumvioletred;
5   }
6 }
7
8 @scope (.dark-theme) to (.light-theme) {
9   a:any-link {
10     color: lightcyan;
11   }
12 }
13
14 @scope (html) {
15   .support {
16     display: none;
17   }
18 }
19
20 body {
21   padding: 1em;
22   margin: 0 auto;
23   max-width: 70ch;
24 }
```

JS

## Scope Boundaries

The dark-theme link should be  lightcyan

The light-theme link should be  mediumvioletred

The dark-theme link should be  lightcyan

With `@scope` boundaries, we can ensure that the dark-theme link color is not applied inside light-theme areas.

# Nested `<style>` Scopes

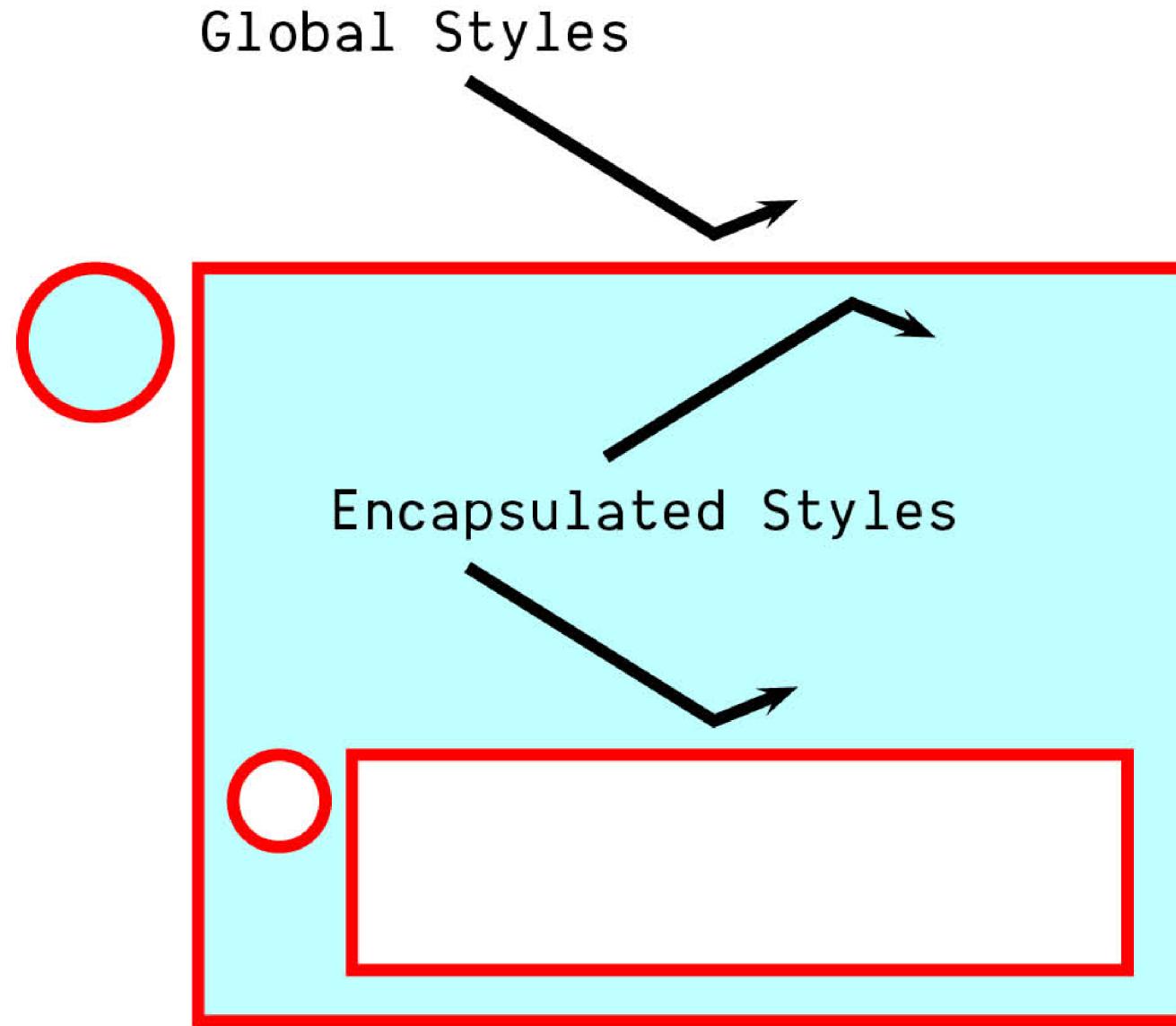
```
<article>
  <style scope="style">
    p { color: green; }
  </style>
  <p>This paragraph will be green.</p>
</article>
```

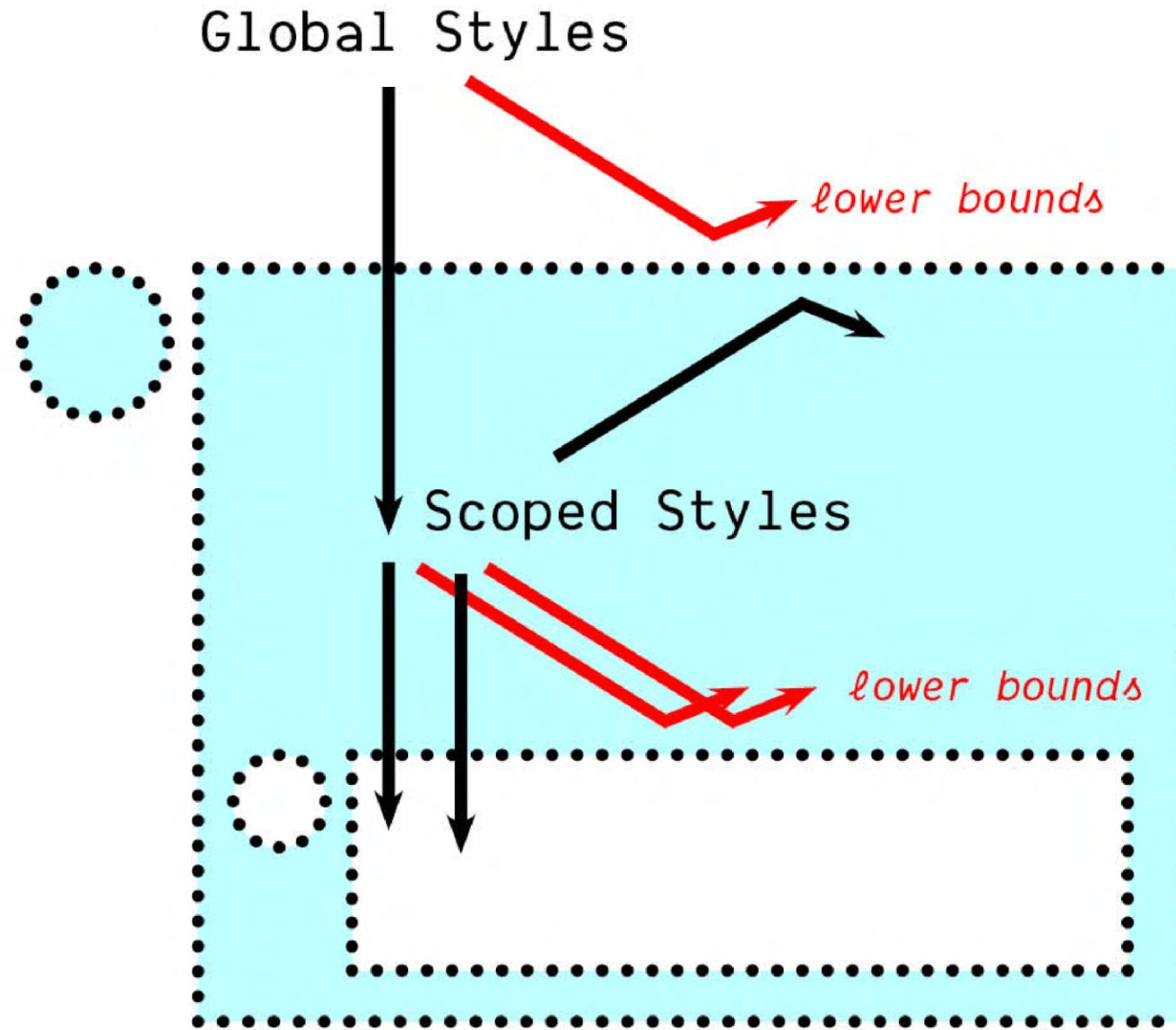
```
<p>This paragraph won't!</p>
```

```
<article>
  <style>
    @scope {
      p { color: green; }
    }
  </style>
  <p>This paragraph will be green.</p>
</article>
```

```
<p>This paragraph won't!</p>
```

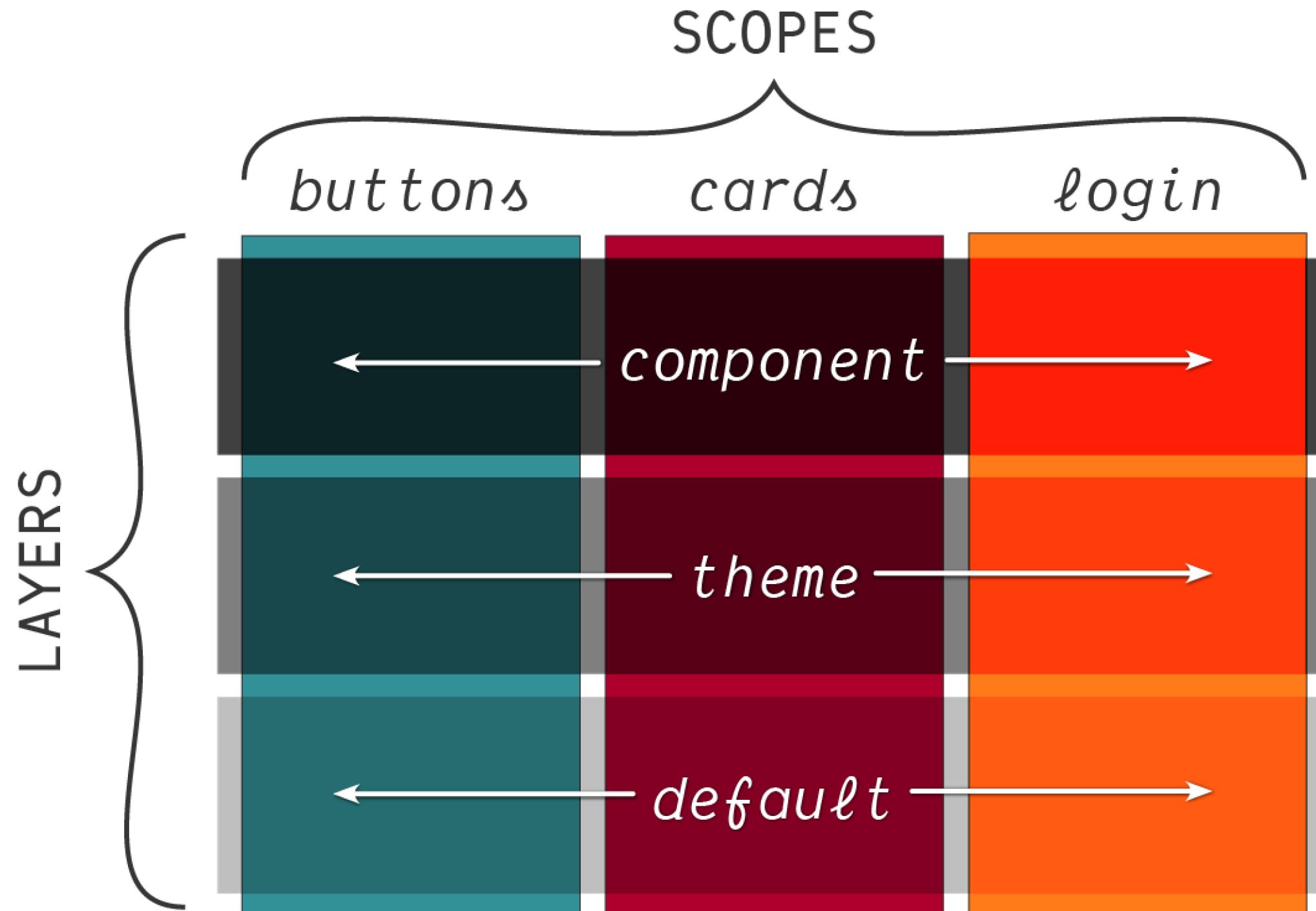
*Different from*  
**Shadow-DOM Encapsulation**





*prototype...*

**Now in Chrome Canary**



# **Don't Fear The Cascade**

*The Cascade is*  
**Our Most Powerful Tool**

# **Core To CHSS**

**css ?**

# **Cascading Style Sheets?**

**css** !

*The cascade is*  
**Getting Major Upgrades**

*The cascade*

**Expresses Layers of Priority**

*The cascade*  
**Facilitates Collaboration**





*@TerribleMia*

**Miriam Suzanne**