CSS variables for work and play

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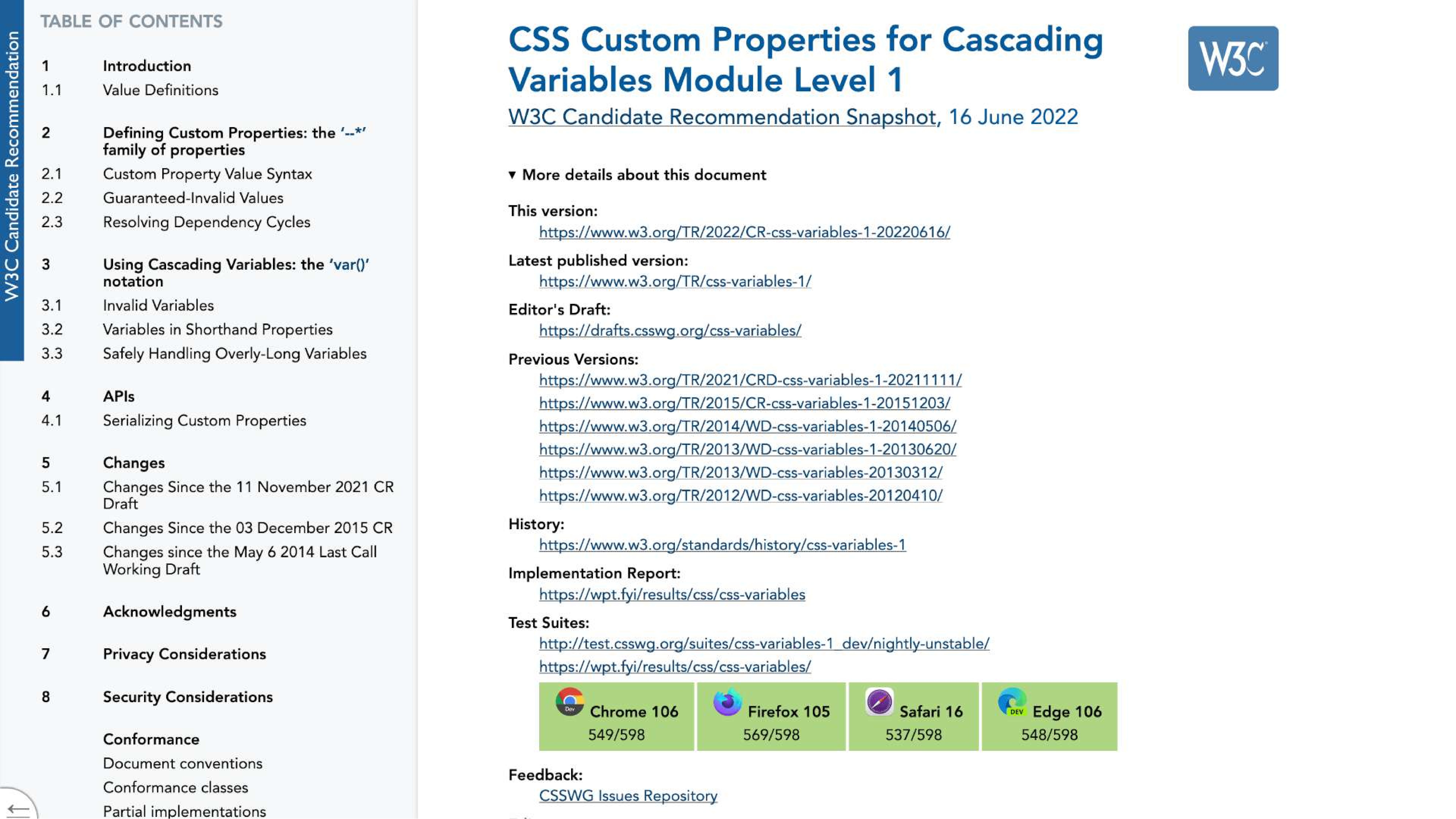
shopify



W3C Candidate Recommendation

TABLE OF CONTENTS

CSS Custom Properties for Cascading Variables Module Level 1

W3C Candidate Recommendation Snapshot, 16 June 2022

▾ **More details about this document**

This version:
https://www.w3.org/TR/2022/CR-css-variables-1-20220616/

Latest published version:
https://www.w3.org/TR/css-variables-1/

Editor's Draft:
https://drafts.csswg.org/css-variables/

Previous Versions:
https://www.w3.org/TR/2021/CRD-css-variables-1-20211111/
https://www.w3.org/TR/2015/CR-css-variables-1-20151203/
https://www.w3.org/TR/2014/WD-css-variables-1-20140506/
https://www.w3.org/TR/2013/WD-css-variables-1-20130620/
https://www.w3.org/TR/2013/WD-css-variables-20130312/
https://www.w3.org/TR/2012/WD-css-variables-20120410/

History:
https://www.w3.org/standards/history/css-variables-1

Implementation Report:
https://wpt.fyi/results/css/css-variables

Test Suites:
http://test.csswg.org/suites/css-variables-1_dev/nightly-unstable/
https://wpt.fyi/results/css/css-variables/

Chrome 106	Firefox 105	Safari 16	Edge 106
549/598	569/598	537/598	548/598

Feedback:
CSSWG Issues Repository

Sass

```
$base-color: #c6538c;
$border-dark: rgba($base-color,
0.88);

.alert {
  border: 1px solid $border-dark;
}
```

{less}

```
@link-color: #428bca;
@link-color-hover: darken(@link-color,
10%);

.link {
  color: @link-color;
}
.link:hover {
  color: @link-color-hover;
}
```

stylus

```
font-size = 14px
font-stack = "Lucida Grande", Arial, sans-
serif

body
  font font-size font-stack
```

Sass variables

Source SCSS

```scss
$accent-colour: cornflowerblue;
.card {
  border: 2px dashed $accent-colour;
}

$accent-colour: palegreen;
.cta {
  box-shadow: 0 5px 15px 5px $accent-colour;
}
```

Compiled CSS

```css
.card {
  border: 2px dashed cornflowerblue;
}

.cta {
  box-shadow: 0 5px 15px 5px palegreen;
}
```

Custom properties syntax

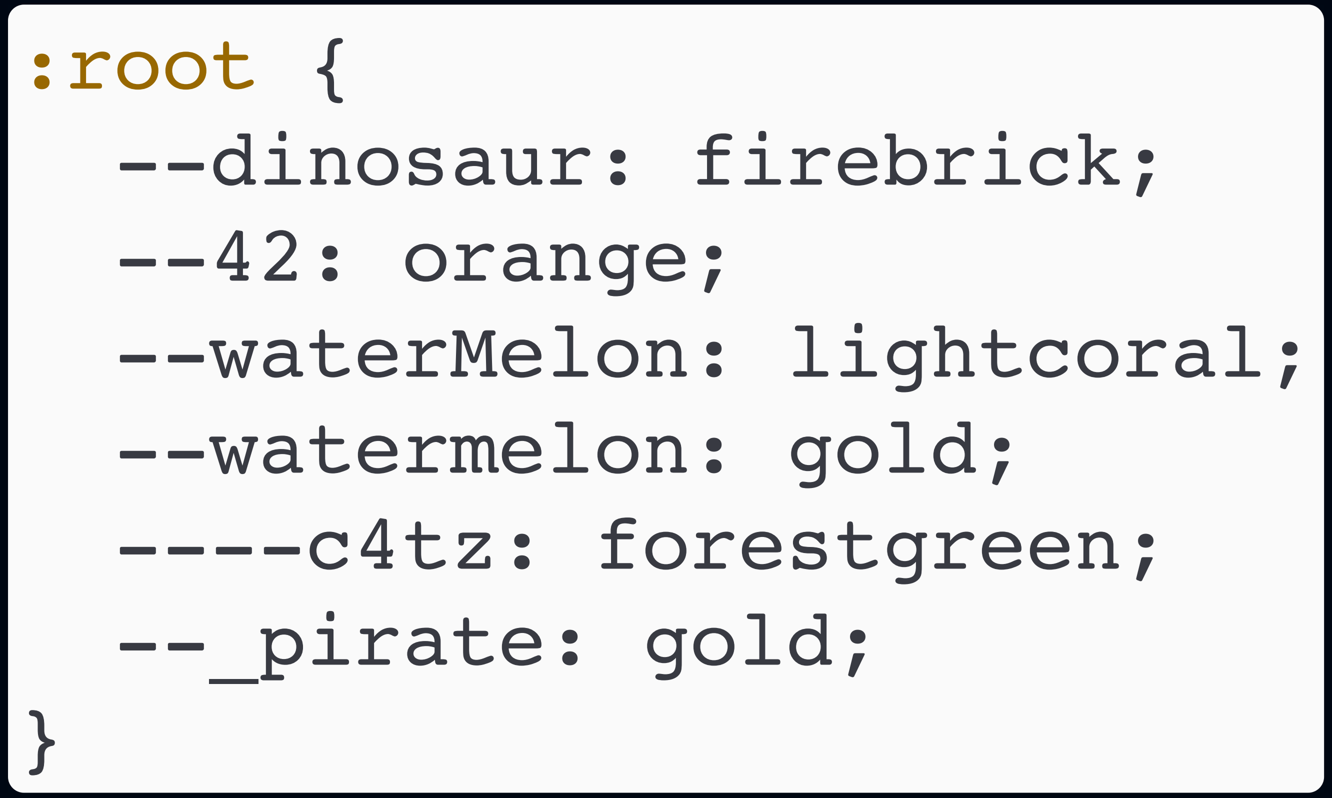
A custom property is any property whose name starts with two dashes (U+002D HYPHEN-MINUS), like `--dinosaur`.

```
--*
```

It will be used to define the substitution value of `var()` functions.

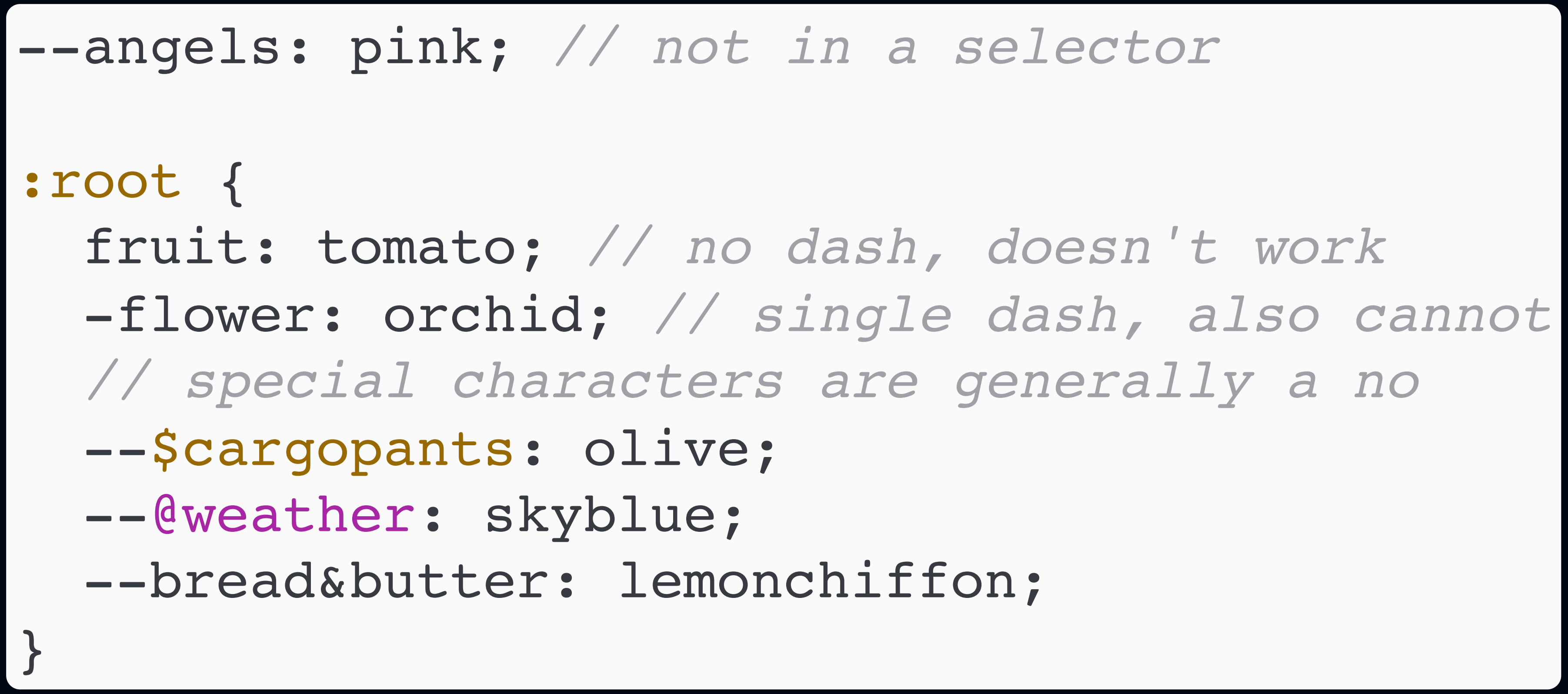
So how to name your variables?

Acceptable 🙆🏻‍♀️



```css
:root {
  --dinosaur: firebrick;
  --42: orange;
  --waterMelon: lightcoral;
  --watermelon: gold;
  ----c4tz: forestgreen;
  --_pirate: gold;
}
```

Sorry, but no 🙅🏻‍♀️



```css
--angels: pink; // not in a selector

:root {
  fruit: tomato; // no dash, doesn't work
  -flower: orchid; // single dash, also cannot
  // special characters are generally a no
  --$cargopants: olive;
  --@weather: skyblue;
  --bread&butter: lemonchiffon;
}
```

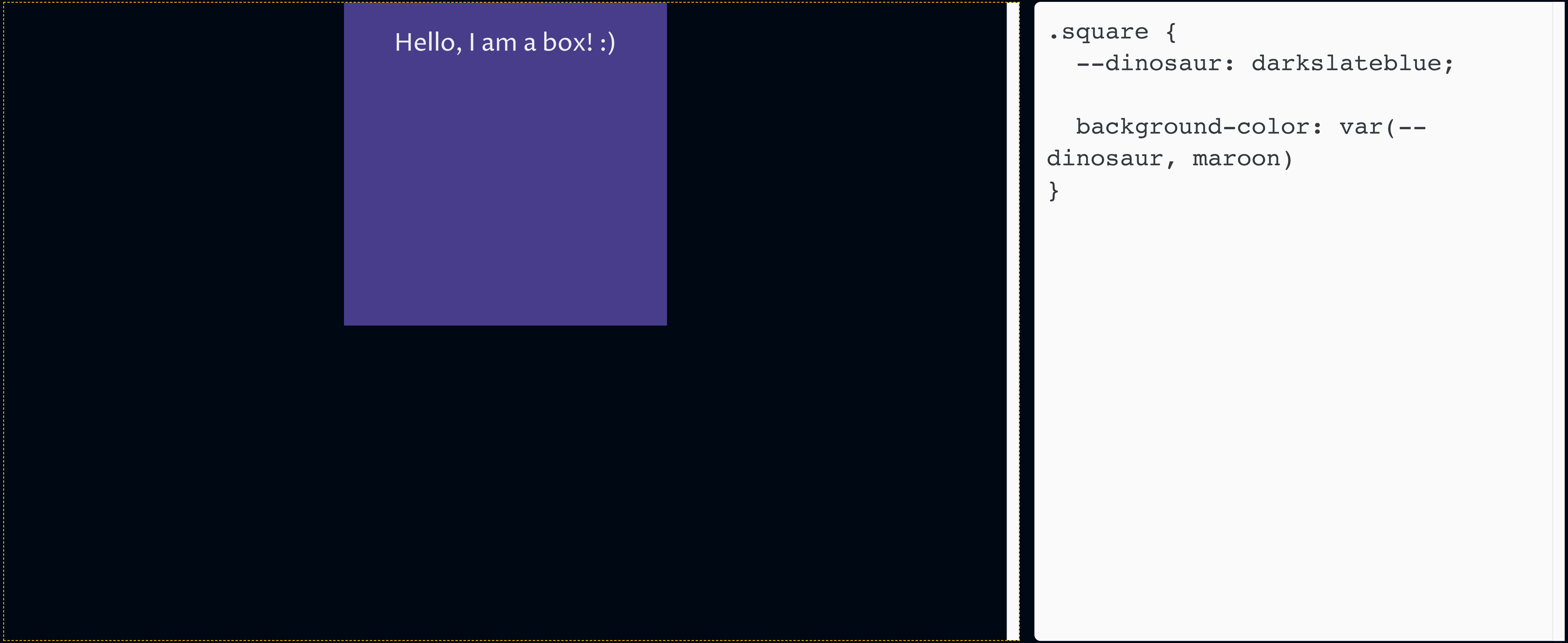
The `var()` notation

```
var( <custom-property-name> , <declaration-value>? )
```

where `<custom-property-name>` is the double-dash prefixed property, and `declaration-value` is the optional fall-back

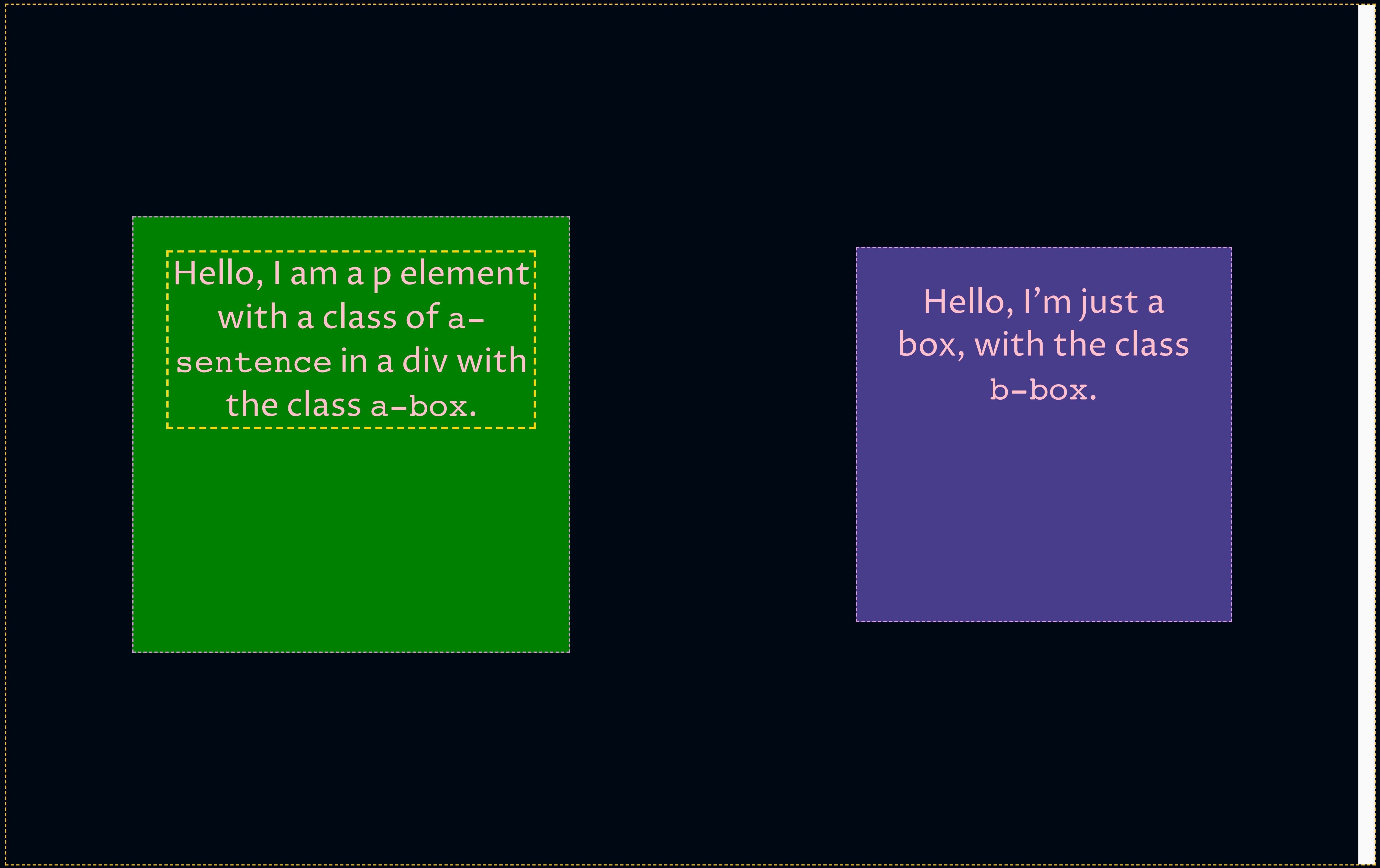
The `var()` notation

The fallback value kicks in if the custom property value is undefined



```css
.square {
  --dinosaur: darkslateblue;

  background-color: var(--dinosaur, maroon)
}
```

Inheriting CSS variable values

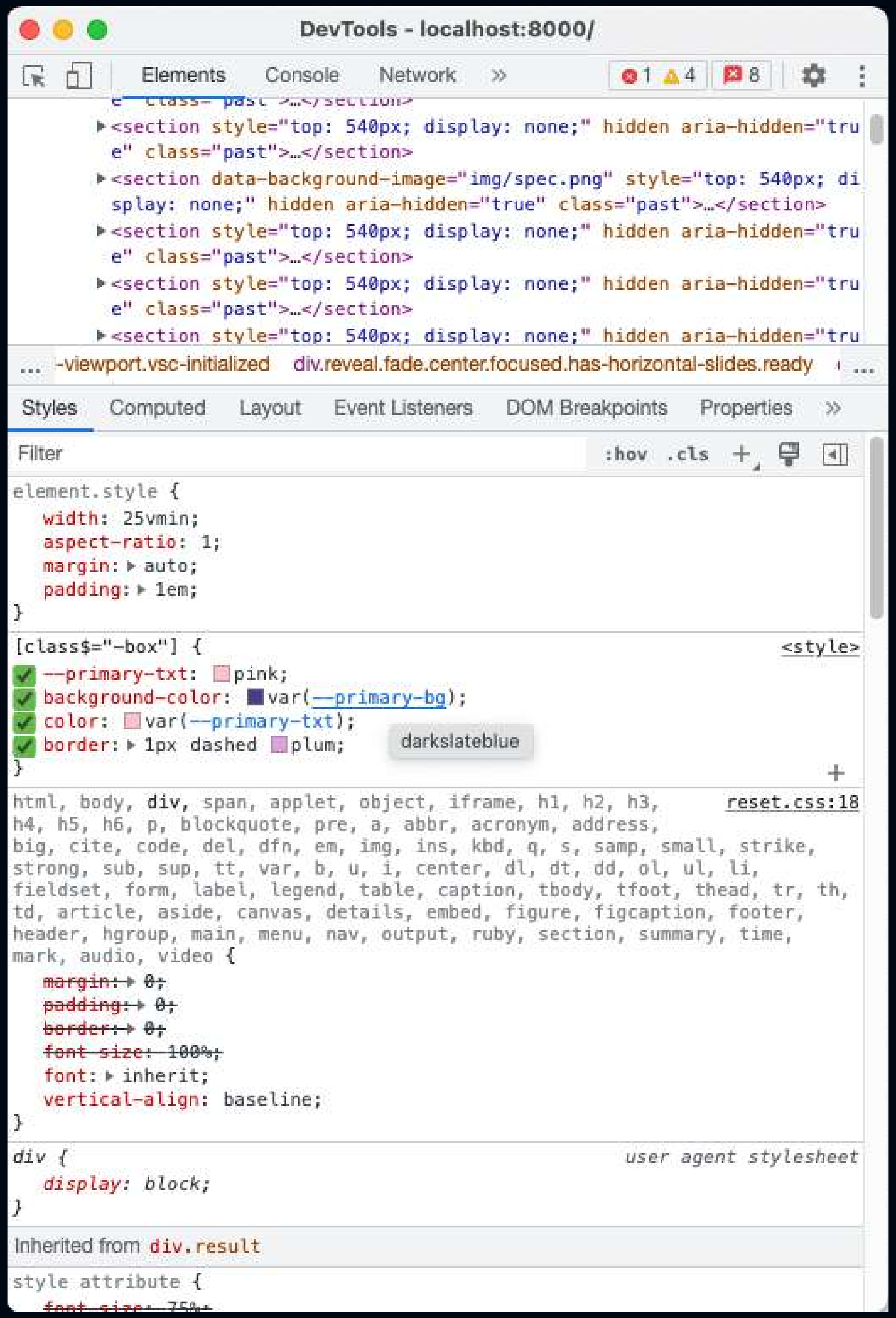


Hello, I am a p element with a class of a-sentence in a div with the class a-box.

Hello, I’m just a box, with the class b-box.

```
:root {
  --primary-bg: darkslateblue;
}

[class$="-box"] {
  --primary-txt: pink;
  background-color: var(--primary-bg);
  color: var(--primary-txt);
  border: 1px dashed plum;
}

.a-box {
  --primary-bg: green;
}

p.a-sentence {
  --primary-txt: gold;
  border: 2px dashed var(--primary-txt);

}
```

Debugging with Devtools

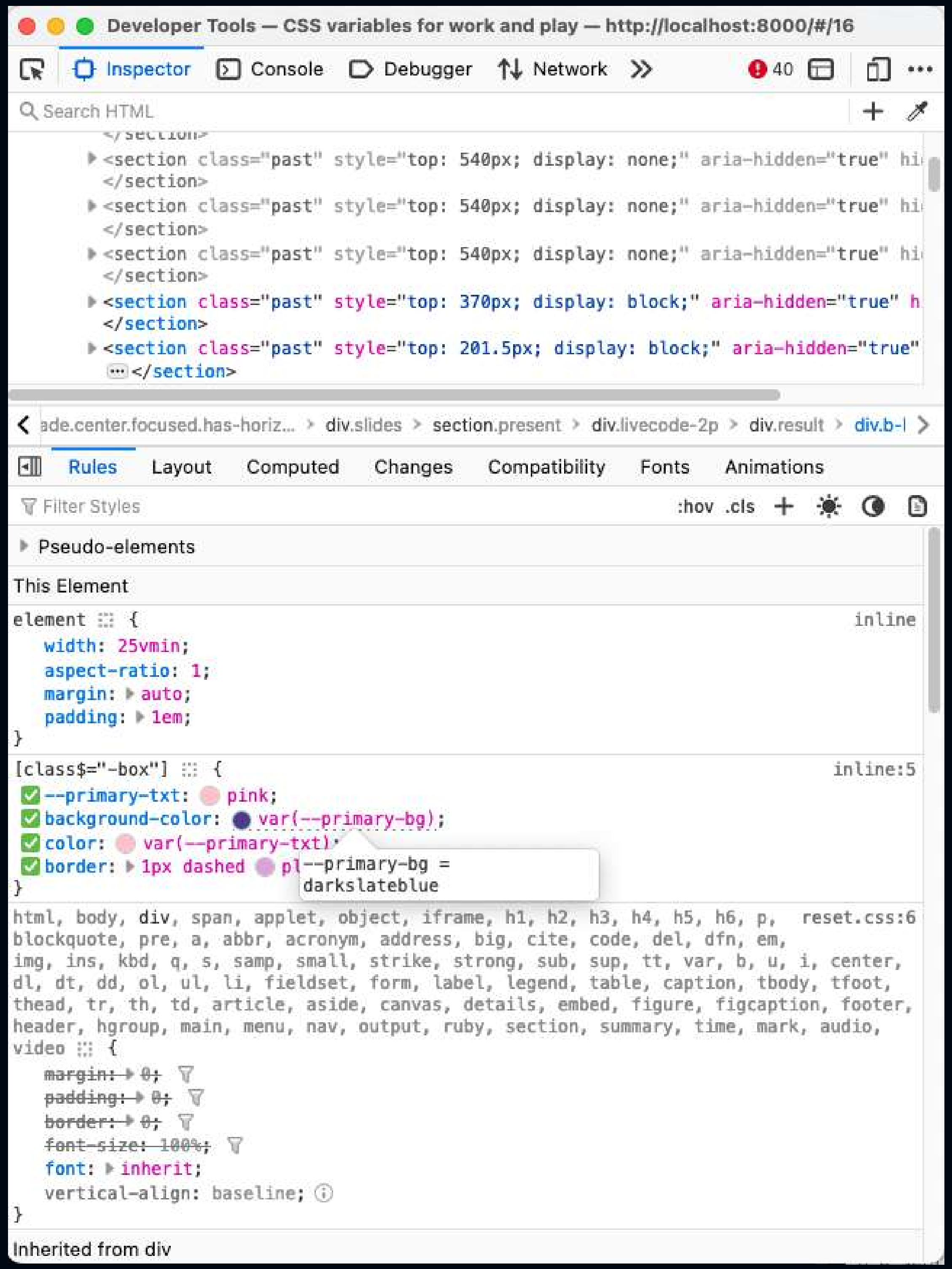


```
 ▶<section style="top: 540px; display: none;" hidden aria-hidden="tru
  e" class="past">…</section>
 ▶<section data-background-image="img/spec.png" style="top: 540px; di
  splay: none;" hidden aria-hidden="true" class="past">…</section>
 ▶<section style="top: 540px; display: none;" hidden aria-hidden="tru
  e" class="past">…</section>
 ▶<section style="top: 540px; display: none;" hidden aria-hidden="tru
  e" class="past">…</section>
 ▶<section style="top: 540px; display: none;" hidden aria-hidden="tru
```

… -viewport.vsc-initialized   div.reveal.fade.center.focused.has-horizontal-slides.ready …

```
element.style {
  width: 25vmin;
  aspect-ratio: 1;
  margin: ▶ auto;
  padding: ▶ 1em;
}
[class$="-box"] {                                              <style>
☑ --primary-txt: pink;
☑ background-color: var(--primary-bg);
☑ color: var(--primary-txt);
☑ border: ▶ 1px dashed plum;
}
html, body, div, span, applet, object, iframe, h1, h2, h3,    reset.css:18
h4, h5, h6, p, blockquote, pre, a, abbr, acronym, address,
big, cite, code, del, dfn, em, img, ins, kbd, q, s, samp, small, strike,
strong, sub, sup, tt, var, b, u, i, center, dl, dt, dd, ol, ul, li,
fieldset, form, label, legend, table, caption, tbody, tfoot, thead, tr, th,
td, article, aside, canvas, details, embed, figure, figcaption, footer,
header, hgroup, main, menu, nav, output, ruby, section, summary, time,
mark, audio, video {
  ~~margin: ▶ 0;~~
  ~~padding: ▶ 0;~~
  ~~border: ▶ 0;~~
  ~~font-size: 100%;~~
  font: ▶ inherit;
  vertical-align: baseline;
}
div {                                            user agent stylesheet
  display: block;
}
Inherited from div.result
style attribute {
  ~~font-size: 75%;~~
```

Chrome

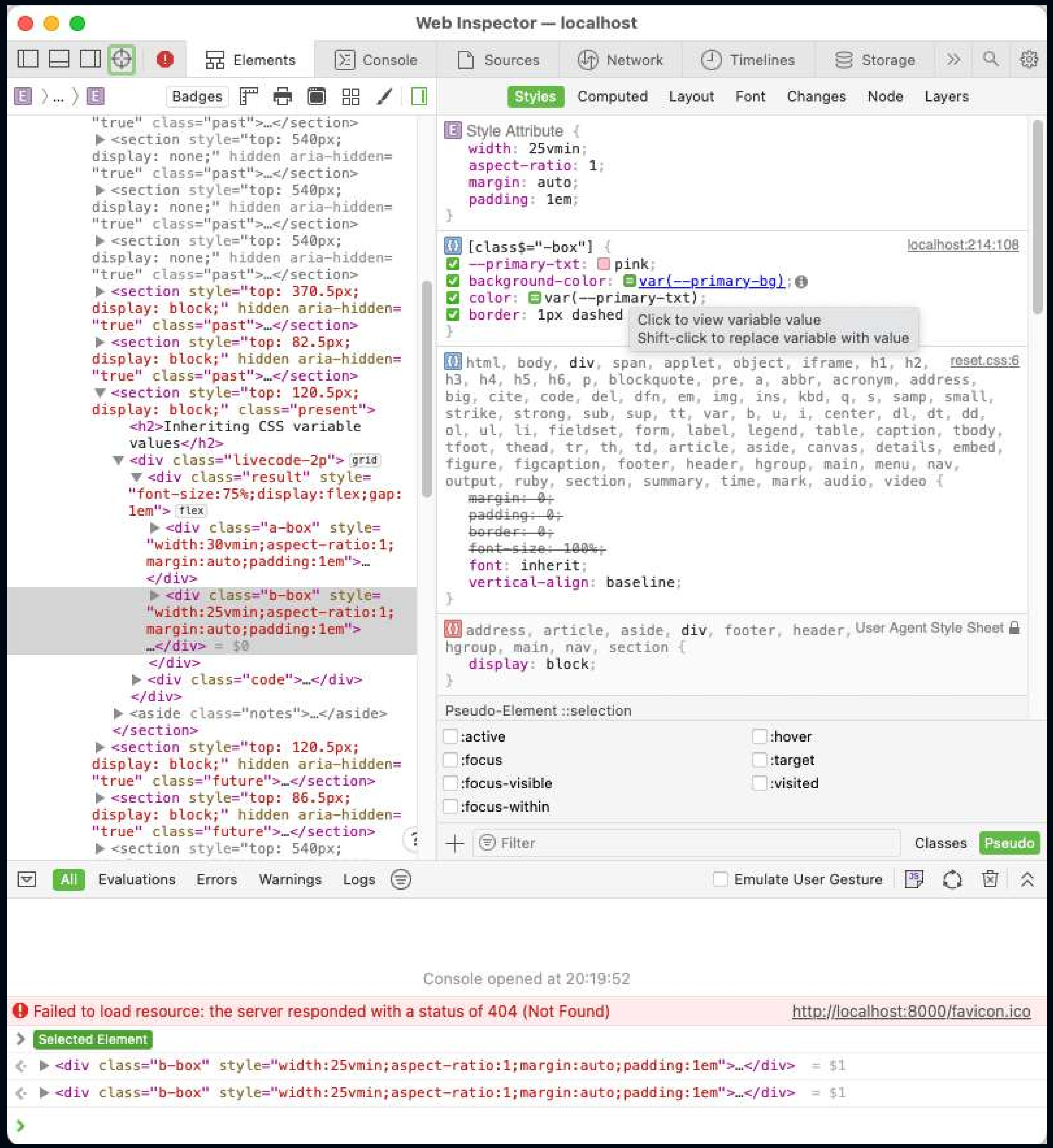


```
 ▶<section class="past" style="top: 540px; display: none;" aria-hidden="true" hi
  </section>
 ▶<section class="past" style="top: 540px; display: none;" aria-hidden="true" hi
  </section>
 ▶<section class="past" style="top: 540px; display: none;" aria-hidden="true" hi
  </section>
 ▶<section class="past" style="top: 370px; display: block;" aria-hidden="true" h
  </section>
 ▶<section class="past" style="top: 201.5px; display: block;" aria-hidden="true"
  ⋯</section>
```

ade.center.focused.has-horiz… › div.slides › section.present › div.livecode-2p › div.result › div.b-l

```
element {                                                       inline
  width: 25vmin;
  aspect-ratio: 1;
  margin: ▶ auto;
  padding: ▶ 1em;
}
[class$="-box"] {                                             inline:5
☑ --primary-txt: pink;
☑ background-color: var(--primary-bg);
☑ color: var(--primary-txt);
☑ border: ▶ 1px dashed pl--primary-bg =
                          darkslateblue
}
html, body, div, span, applet, object, iframe, h1, h2, h3, h4, h5, h6, p,  reset.css:6
blockquote, pre, a, abbr, acronym, address, big, cite, code, del, dfn, em,
img, ins, kbd, q, s, samp, small, strike, strong, sub, sup, tt, var, b, u, i, center,
dl, dt, dd, ol, ul, li, fieldset, form, label, legend, table, caption, tbody, tfoot,
thead, tr, th, td, article, aside, canvas, details, embed, figure, figcaption, footer,
header, hgroup, main, menu, nav, output, ruby, section, summary, time, mark, audio,
video {
  ~~margin: ▶ 0;~~
  ~~padding: ▶ 0;~~
  ~~border: ▶ 0;~~
  ~~font-size: 100%;~~
  font: ▶ inherit;
  vertical-align: baseline;
}
Inherited from div
```

Firefox



```
"true" class="past">…</section>
▶<section style="top: 540px;
display: none;" hidden aria-hidden=
"true" class="past">…</section>
▶<section style="top: 540px;
display: none;" hidden aria-hidden=
"true" class="past">…</section>
▶<section style="top: 540px;
display: none;" hidden aria-hidden=
"true" class="past">…</section>
▶<section style="top: 370.5px;
display: block;" hidden aria-hidden=
"true" class="past">…</section>
▶<section style="top: 82.5px;
display: block;" hidden aria-hidden=
"true" class="past">…</section>
▼<section style="top: 120.5px;
display: block;" class="present">
   <h2>Inheriting CSS variable
   values</h2>
  ▼<div class="livecode-2p"> grid
    ▼<div class="result" style=
    "font-size:75%;display:flex;gap:
    1em"> flex
      ▶<div class="a-box" style=
      "width:30vmin;aspect-ratio:1;
      margin:auto;padding:1em">…
      </div>
      ▶<div class="b-box" style=
      "width:25vmin;aspect-ratio:1;
      margin:auto;padding:1em">
      …</div> = $0
     </div>
    ▶<div class="code">…</div>
    </div>
  ▶<aside class="notes">…</aside>
 </section>
▶<section style="top: 120.5px;
display: block;" hidden aria-hidden=
"true" class="future">…</section>
▶<section style="top: 86.5px;
display: block;" hidden aria-hidden=
"true" class="future">…</section>
▶<section style="top: 540px;
```

```
Style Attribute {
  width: 25vmin;
  aspect-ratio: 1;
  margin: auto;
  padding: 1em;
}
[class$="-box"] {                                  localhost:214:108
☑ --primary-txt: pink;
☑ background-color: var(--primary-bg);
☑ color: var(--primary-txt);
☑ border: 1px dashed
}
html, body, div, span, applet, object, iframe, h1, h2,     reset.css:6
h3, h4, h5, h6, p, blockquote, pre, a, abbr, acronym, address,
big, cite, code, del, dfn, em, img, ins, kbd, q, s, samp, small,
strike, strong, sub, sup, tt, var, b, u, i, center, dl, dt, dd,
ol, ul, li, fieldset, form, label, legend, table, caption, tbody,
tfoot, thead, tr, th, td, article, aside, canvas, details, embed,
figure, figcaption, footer, header, hgroup, main, menu, nav,
output, ruby, section, summary, time, mark, audio, video {
  ~~margin: 0;~~
  ~~padding: 0;~~
  ~~border: 0;~~
  ~~font-size: 100%;~~
  font: inherit;
  vertical-align: baseline;
}
address, article, aside, div, footer, header, User Agent Style Sheet
hgroup, main, nav, section {
  display: block;
}
```

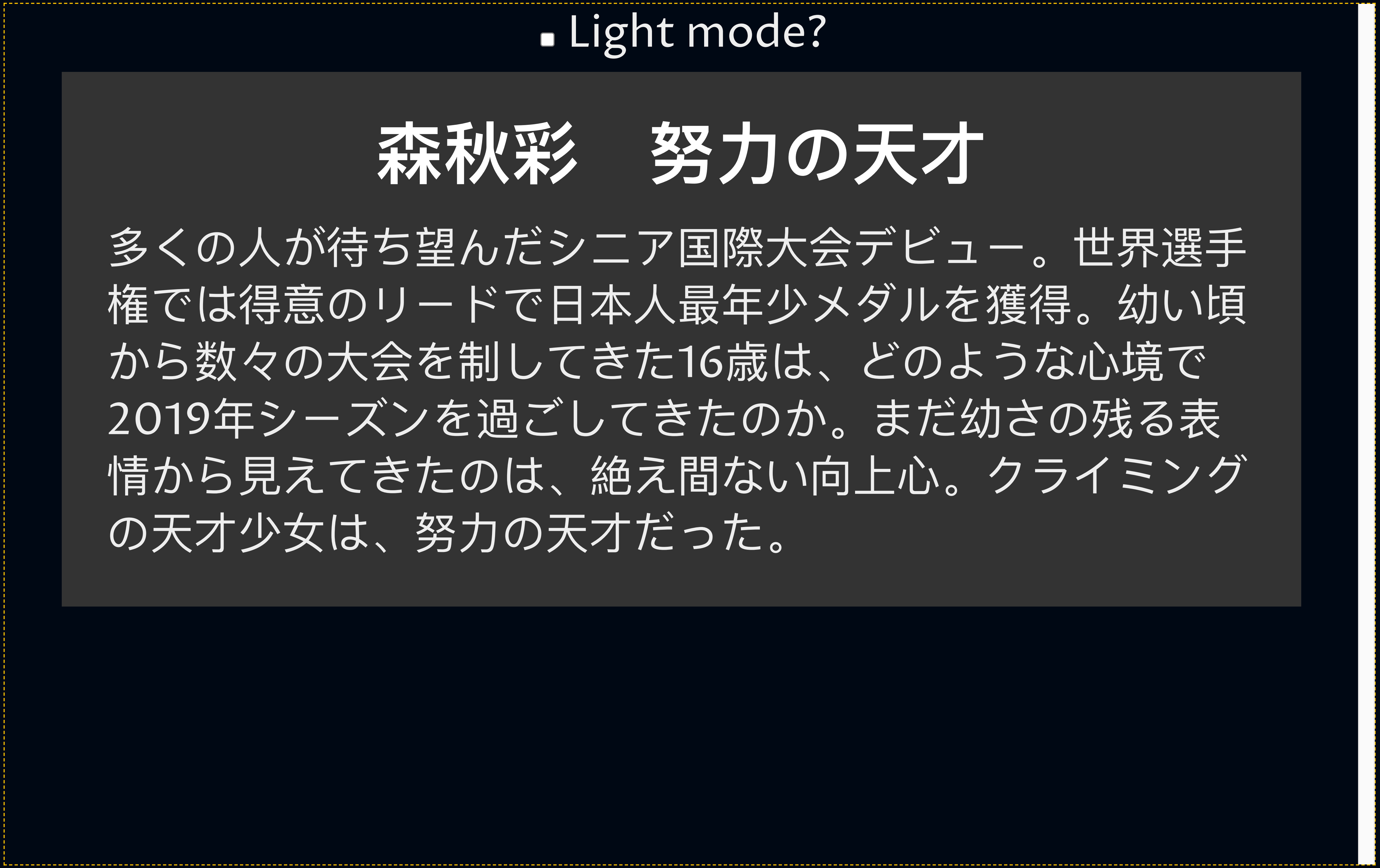
Pseudo-Element ::selection

☐ :active ☐ :hover
☐ :focus ☐ :target
☐ :focus-visible ☐ :visited
☐ :focus-within

```
Console opened at 20:19:52
Failed to load resource: the server responded with a status of 404 (Not Found)   http://localhost:8000/favicon.ico
> Selected Element
< ▶<div class="b-box" style="width:25vmin;aspect-ratio:1;margin:auto;padding:1em">…</div>  = $1
< ▶<div class="b-box" style="width:25vmin;aspect-ratio:1;margin:auto;padding:1em">…</div>  = $1
>
```

Safari

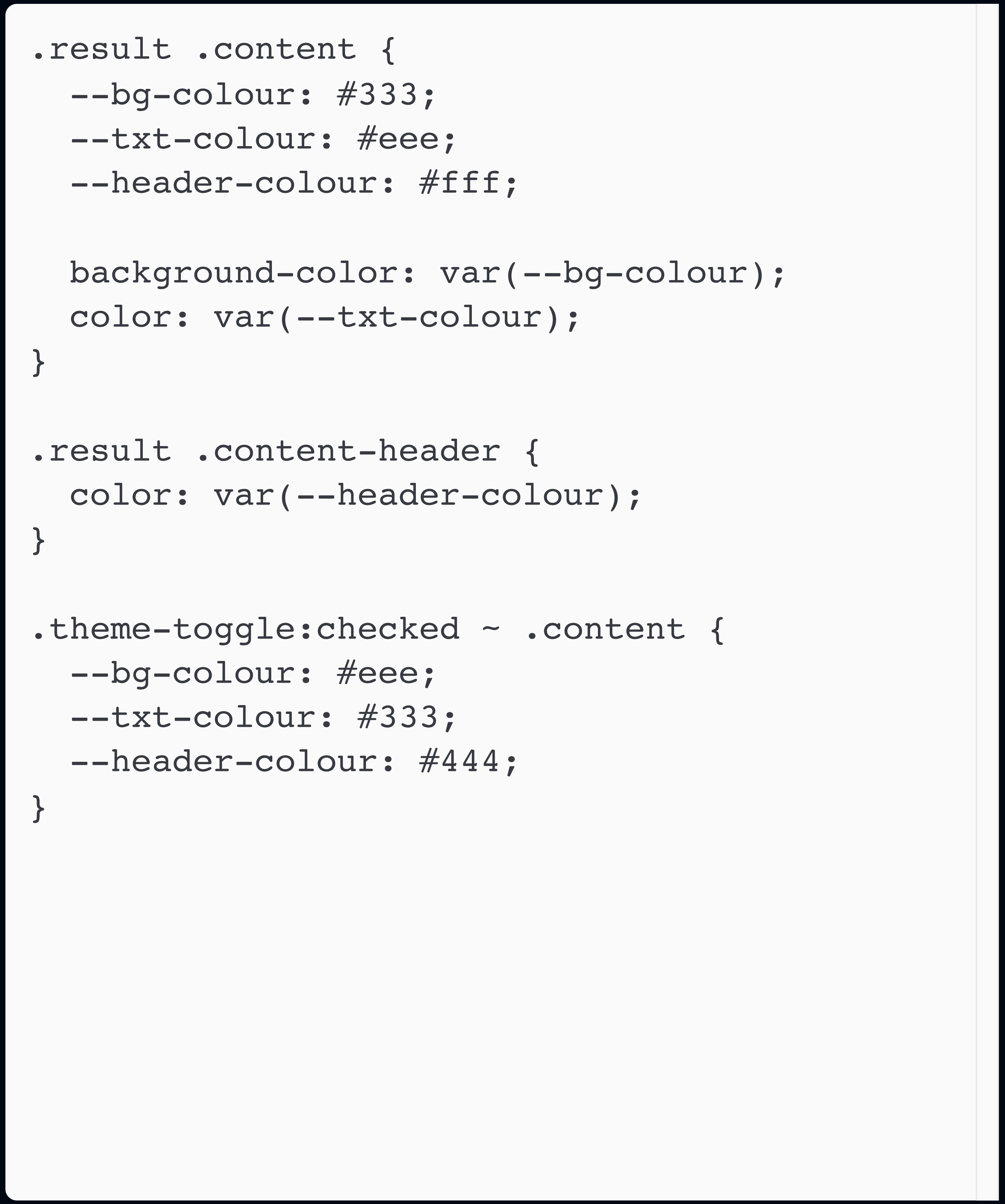
The dark/light mode toggle



□ Light mode?

森秋彩　努力の天才

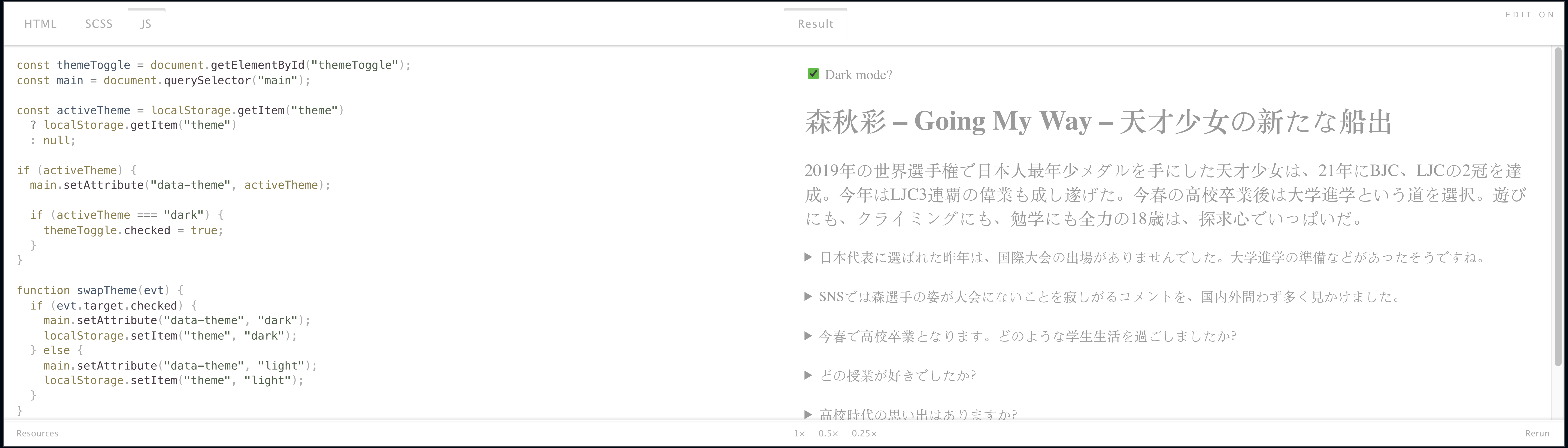
多くの人が待ち望んだシニア国際大会デビュー。世界選手権では得意のリードで日本人最年少メダルを獲得。幼い頃から数々の大会を制してきた16歳は、どのような心境で2019年シーズンを過ごしてきたのか。まだ幼さの残る表情から見えてきたのは、絶え間ない向上心。クライミングの天才少女は、努力の天才だった。



```css
.result .content {
  --bg-colour: #333;
  --txt-colour: #eee;
  --header-colour: #fff;

  background-color: var(--bg-colour);
  color: var(--txt-colour);
}

.result .content-header {
  color: var(--header-colour);
}

.theme-toggle:checked ~ .content {
  --bg-colour: #eee;
  --txt-colour: #333;
  --header-colour: #444;
}
```

Sprinkle on Javascript

Data attributes are useful for theming, `localStorage` can be used for persistence



```
const themeToggle = document.getElementById("themeToggle");
const main = document.querySelector("main");

const activeTheme = localStorage.getItem("theme")
  ? localStorage.getItem("theme")
  : null;

if (activeTheme) {
  main.setAttribute("data-theme", activeTheme);

  if (activeTheme === "dark") {
    themeToggle.checked = true;
  }
}

function swapTheme(evt) {
  if (evt.target.checked) {
    main.setAttribute("data-theme", "dark");
    localStorage.setItem("theme", "dark");
  } else {
    main.setAttribute("data-theme", "light");
    localStorage.setItem("theme", "light");
  }
}
```

☑ Dark mode?

森秋彩 – Going My Way – 天才少女の新たな船出

2019年の世界選手権で日本人最年少メダルを手にした天才少女は、21年にBJC、LJCの2冠を達成。今年はLJC3連覇の偉業も成し遂げた。今春の高校卒業後は大学進学という道を選択。遊びにも、クライミングにも、勉学にも全力の18歳は、探求心でいっぱいだ。

▶ 日本代表に選ばれた昨年は、国際大会の出場がありませんでした。大学進学の準備などがあったそうですね。

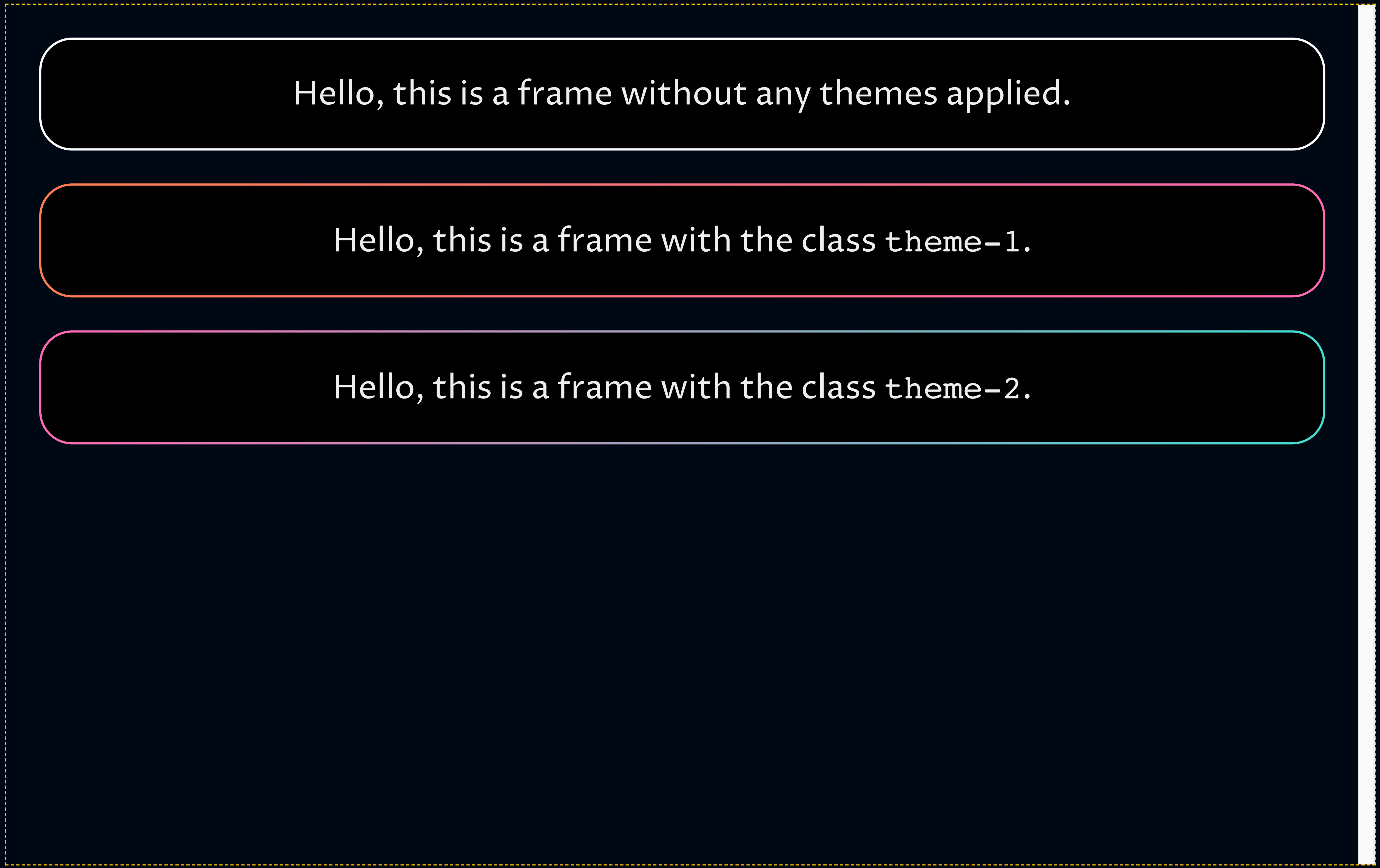
▶ SNSでは森選手の姿が大会にないことを寂しがるコメントを、国内外問わず多く見かけました。

▶ 今春で高校卒業となります。どのような学生生活を過ごしましたか?

▶ どの授業が好きでしたか?

▶ 高校時代の思い出はありますか?

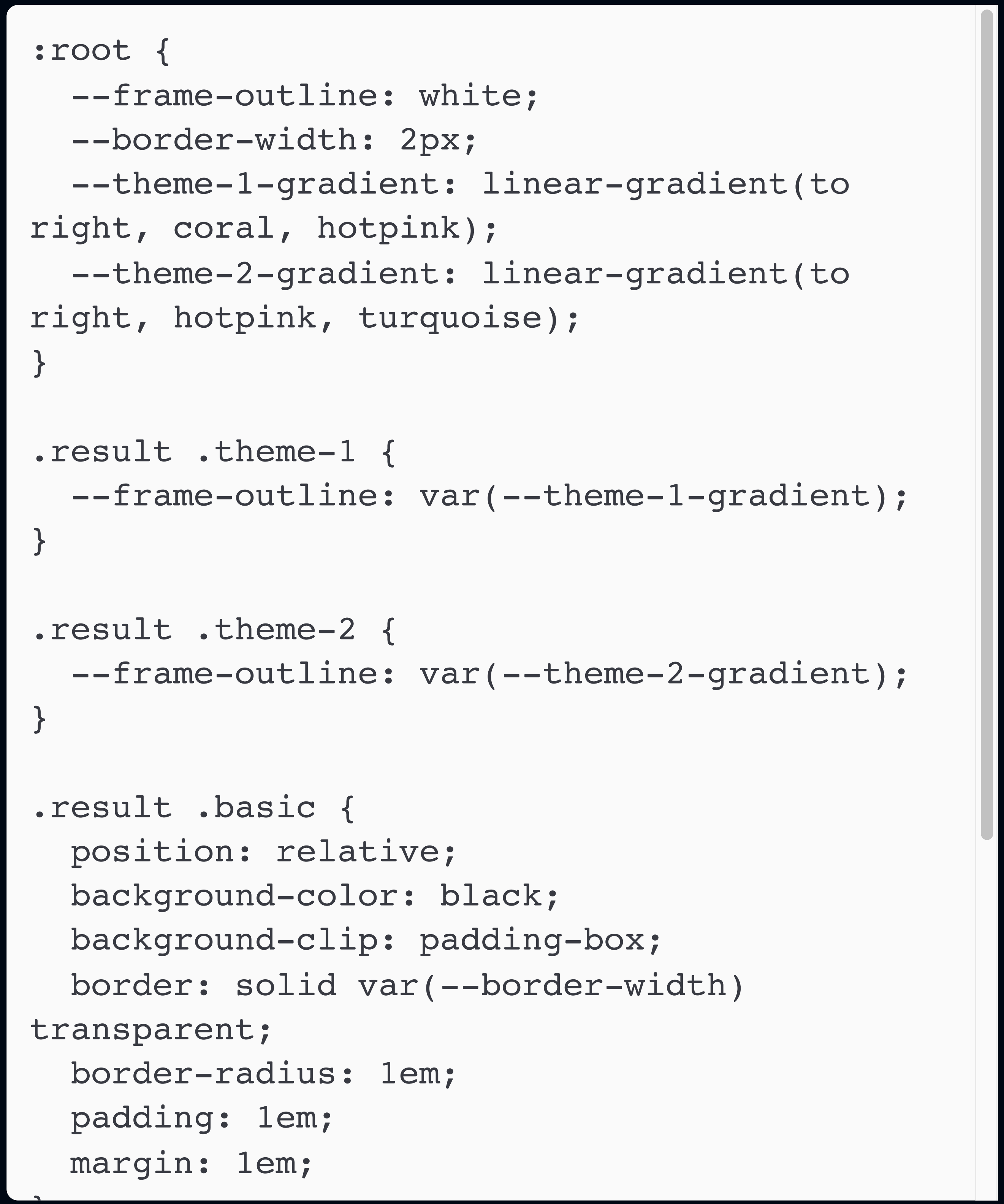
Basic theming example



Hello, this is a frame without any themes applied.

Hello, this is a frame with the class `theme-1`.

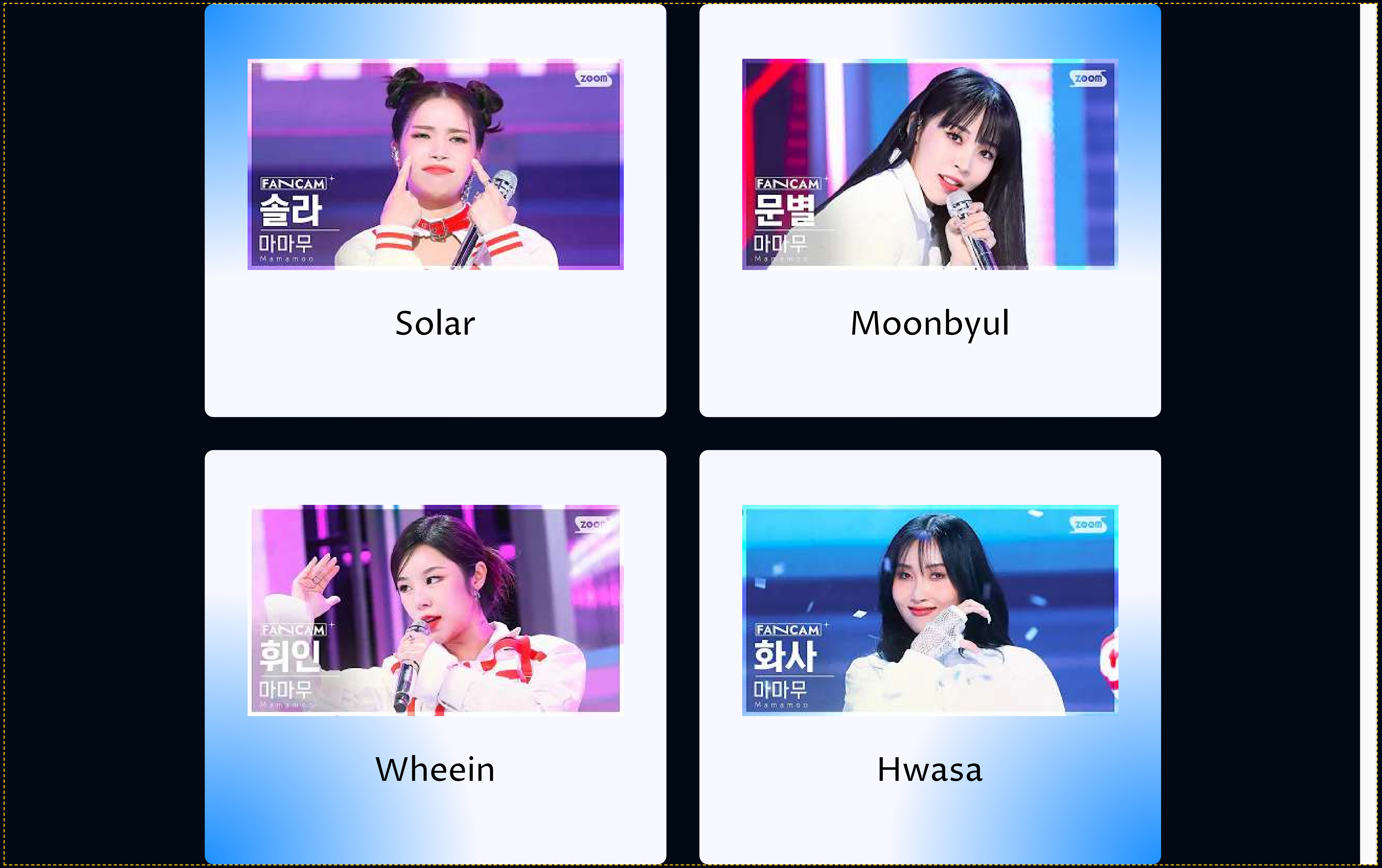
Hello, this is a frame with the class `theme-2`.

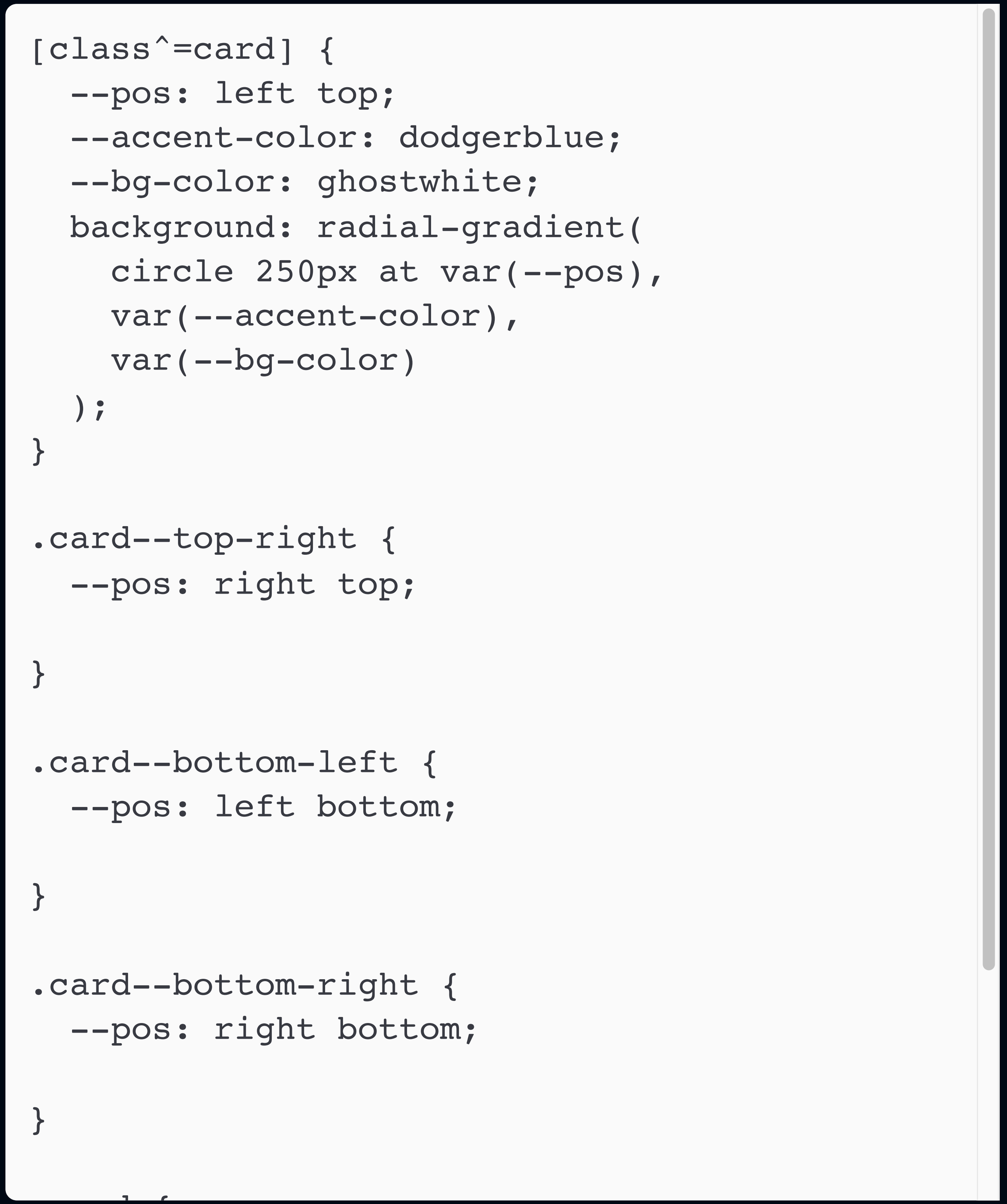


```
:root {
  --frame-outline: white;
  --border-width: 2px;
  --theme-1-gradient: linear-gradient(to
right, coral, hotpink);
  --theme-2-gradient: linear-gradient(to
right, hotpink, turquoise);
}

.result .theme-1 {
  --frame-outline: var(--theme-1-gradient);
}

.result .theme-2 {
  --frame-outline: var(--theme-2-gradient);
}

.result .basic {
  position: relative;
  background-color: black;
  background-clip: padding-box;
  border: solid var(--border-width)
transparent;
  border-radius: 1em;
  padding: 1em;
  margin: 1em;
```

Maintainable variant styling

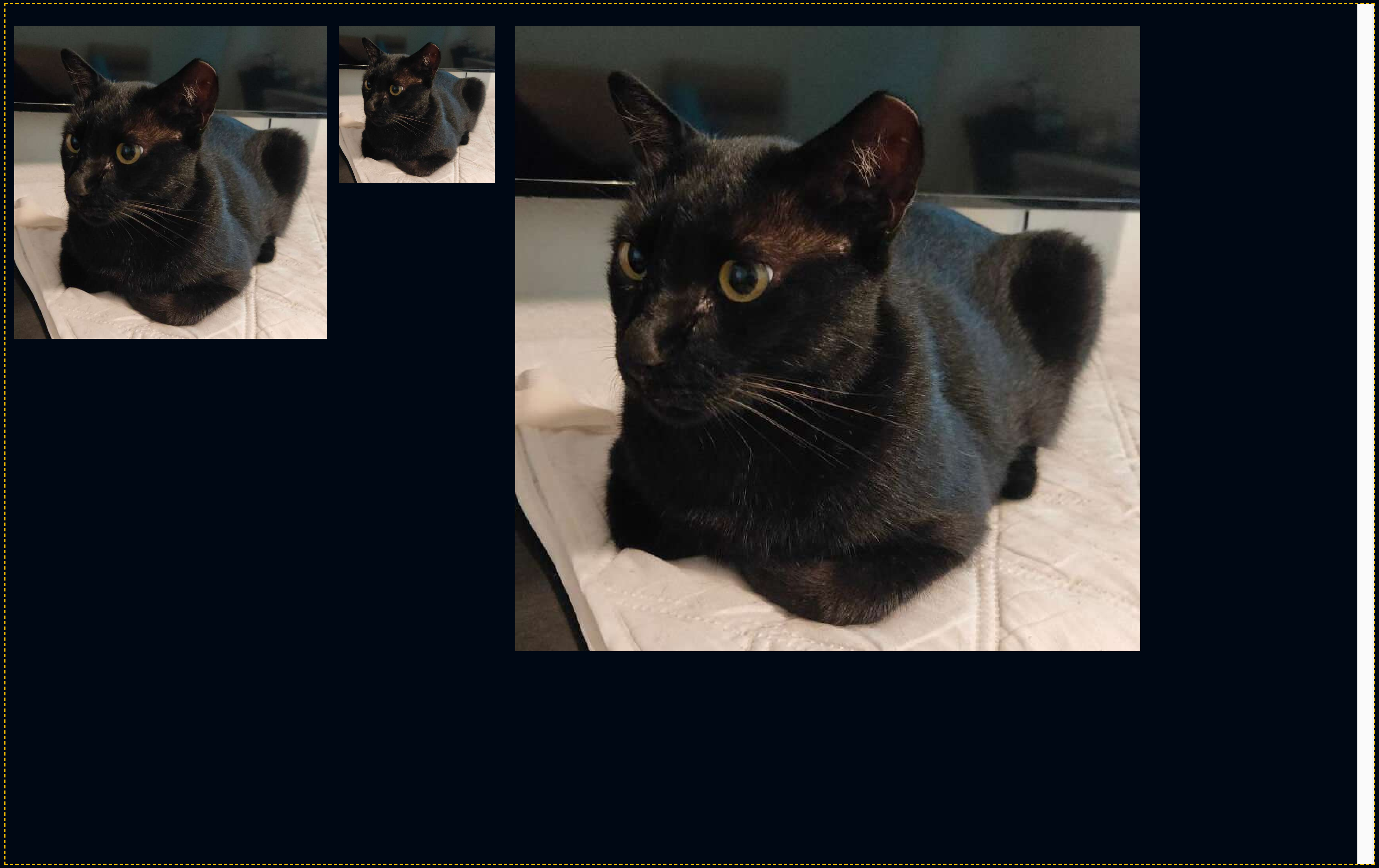
```
radial-gradient( [ <ending-shape> || <size> ]? [ at <position> ]? , <color-stop-list> )
```

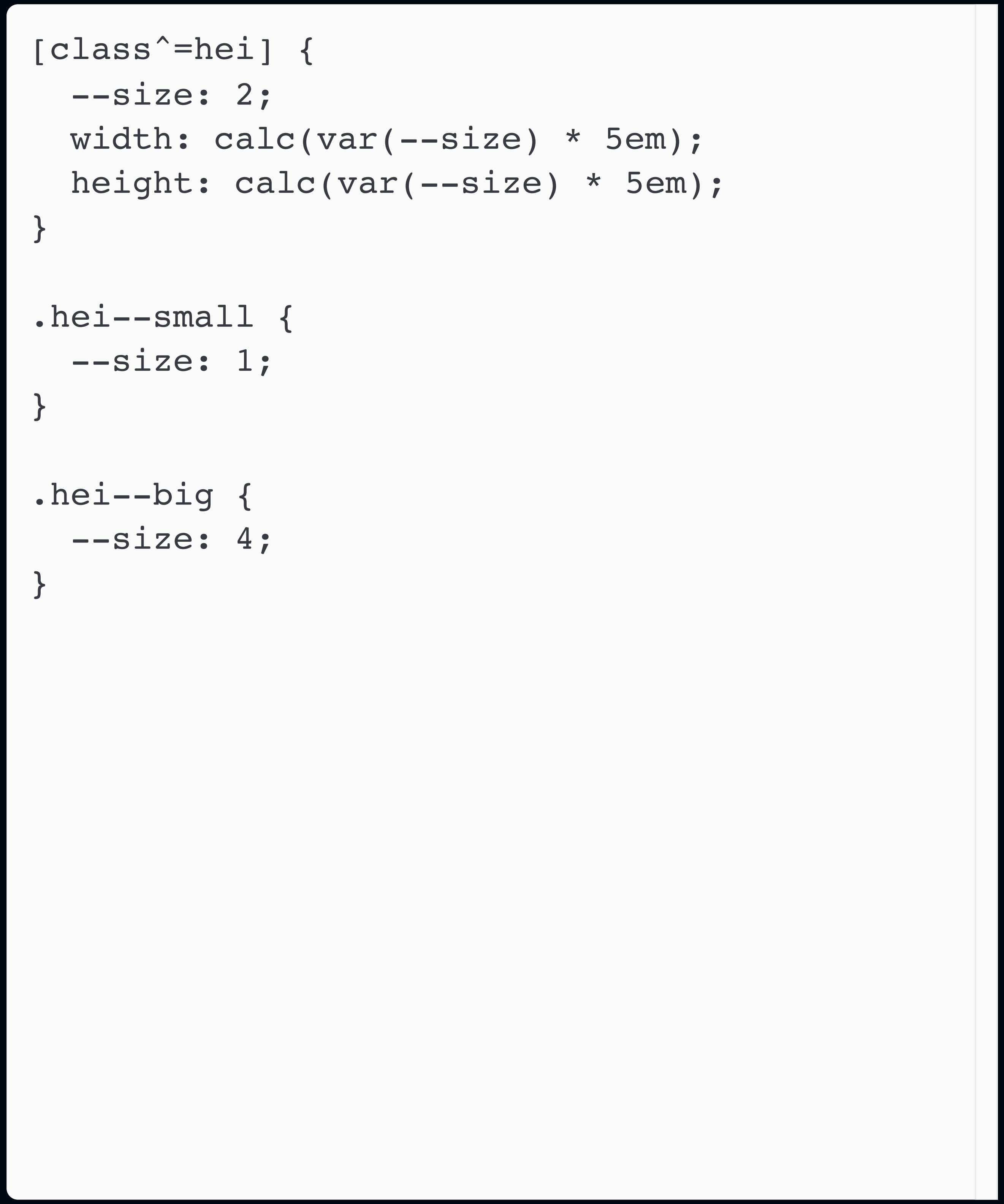




```
[class^=card] {
  --pos: left top;
  --accent-color: dodgerblue;
  --bg-color: ghostwhite;
  background: radial-gradient(
    circle 250px at var(--pos),
    var(--accent-color),
    var(--bg-color)
  );
}

.card--top-right {
  --pos: right top;

}

.card--bottom-left {
  --pos: left bottom;

}

.card--bottom-right {
  --pos: right bottom;

}
```

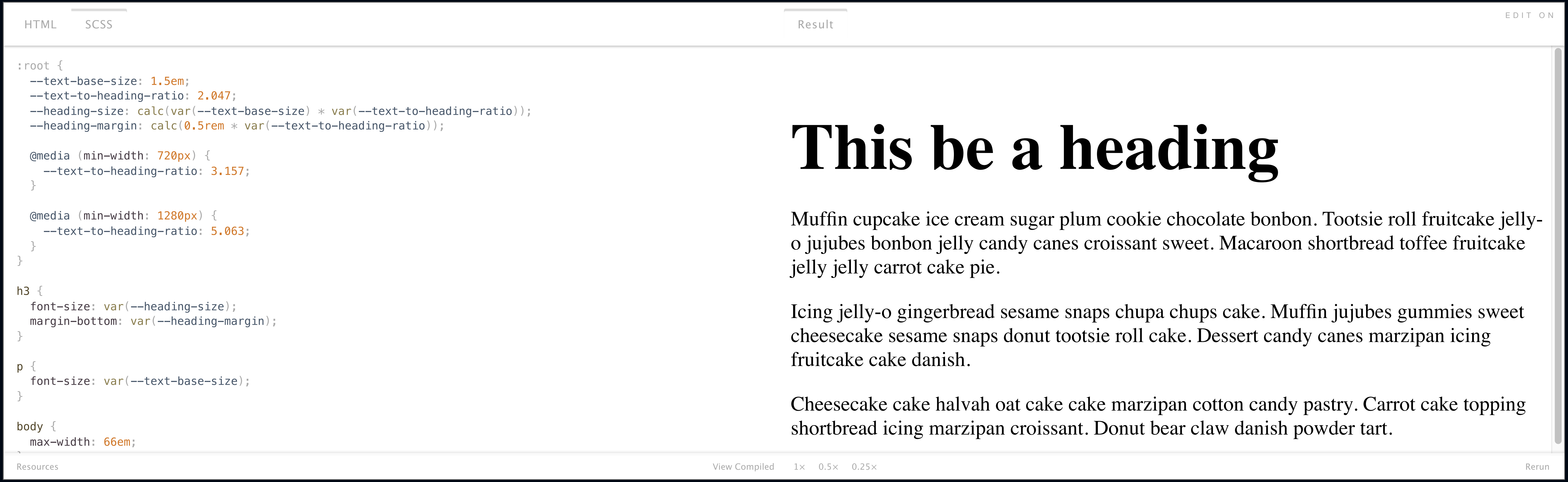
Combine with `calc()`





```css
[class^=hei] {
  --size: 2;
  width: calc(var(--size) * 5em);
  height: calc(var(--size) * 5em);
}

.hei--small {
  --size: 1;
}

.hei--big {
  --size: 4;
}
```

CSS variables in media queries



```
:root {
  --text-base-size: 1.5em;
  --text-to-heading-ratio: 2.047;
  --heading-size: calc(var(--text-base-size) * var(--text-to-heading-ratio));
  --heading-margin: calc(0.5rem * var(--text-to-heading-ratio));

  @media (min-width: 720px) {
    --text-to-heading-ratio: 3.157;
  }

  @media (min-width: 1280px) {
    --text-to-heading-ratio: 5.063;
  }
}

h3 {
  font-size: var(--heading-size);
  margin-bottom: var(--heading-margin);
}

p {
  font-size: var(--text-base-size);
}

body {
  max-width: 66em;
```

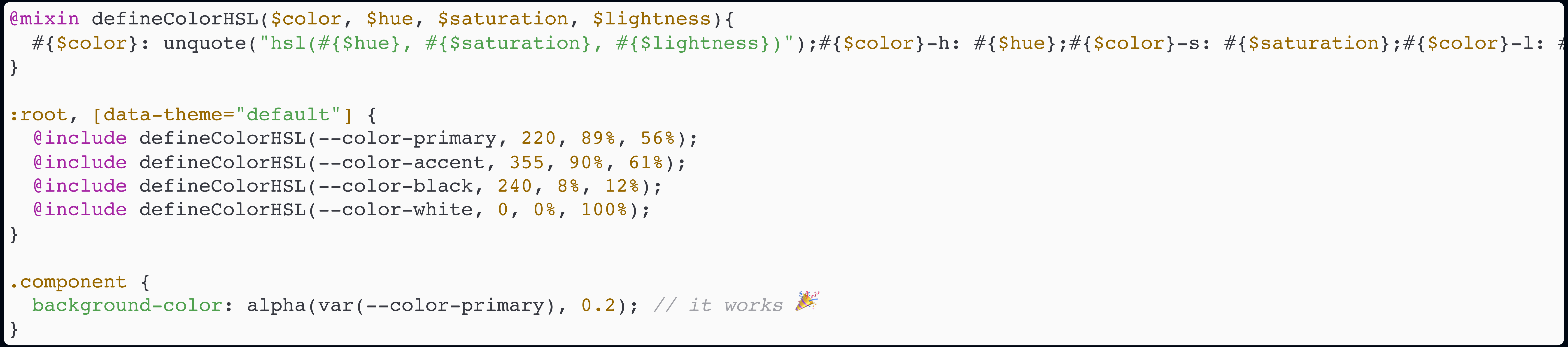
This be a heading

Muffin cupcake ice cream sugar plum cookie chocolate bonbon. Tootsie roll fruitcake jelly-o jujubes bonbon jelly candy canes croissant sweet. Macaroon shortbread toffee fruitcake jelly jelly carrot cake pie.

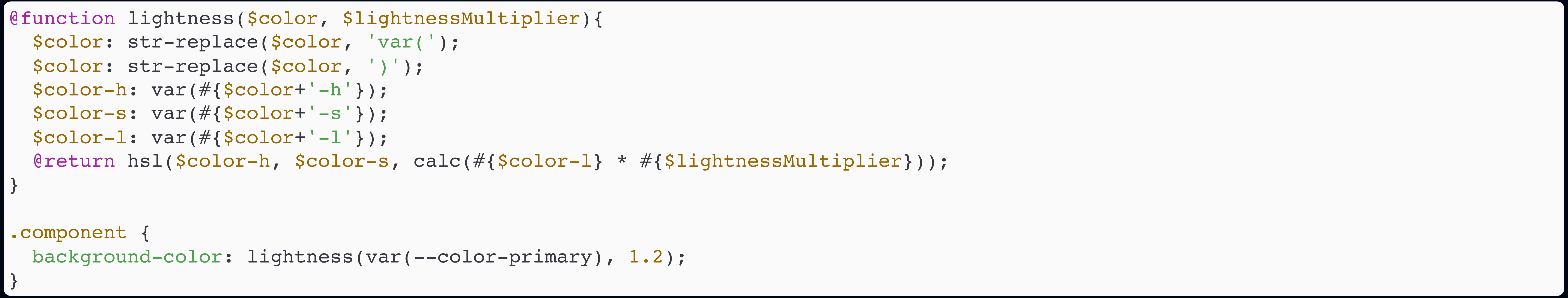
Icing jelly-o gingerbread sesame snaps chupa chups cake. Muffin jujubes gummies sweet cheesecake sesame snaps donut tootsie roll cake. Dessert candy canes marzipan icing fruitcake cake danish.

Cheesecake cake halvah oat cake cake marzipan cotton candy pastry. Carrot cake topping shortbread icing marzipan croissant. Donut bear claw danish powder tart.

Sass is still relevant



```scss
@mixin defineColorHSL($color, $hue, $saturation, $lightness){
  #{$color}: unquote("hsl(#{$hue}, #{$saturation}, #{$lightness})");#{$color}-h: #{$hue};#{$color}-s: #{$saturation};#{$color}-l: #
}

:root, [data-theme="default"] {
  @include defineColorHSL(--color-primary, 220, 89%, 56%);
  @include defineColorHSL(--color-accent, 355, 90%, 61%);
  @include defineColorHSL(--color-black, 240, 8%, 12%);
  @include defineColorHSL(--color-white, 0, 0%, 100%);
}

.component {
  background-color: alpha(var(--color-primary), 0.2); // it works 🎉
}
```



```scss
@function lightness($color, $lightnessMultiplier){
  $color: str-replace($color, 'var(');
  $color: str-replace($color, ')');
  $color-h: var(#{$color+'-h'});
  $color-s: var(#{$color+'-s'});
  $color-l: var(#{$color+'-l'});
  @return hsl($color-h, $color-s, calc(#{$color-l} * #{$lightnessMultiplier}));
}

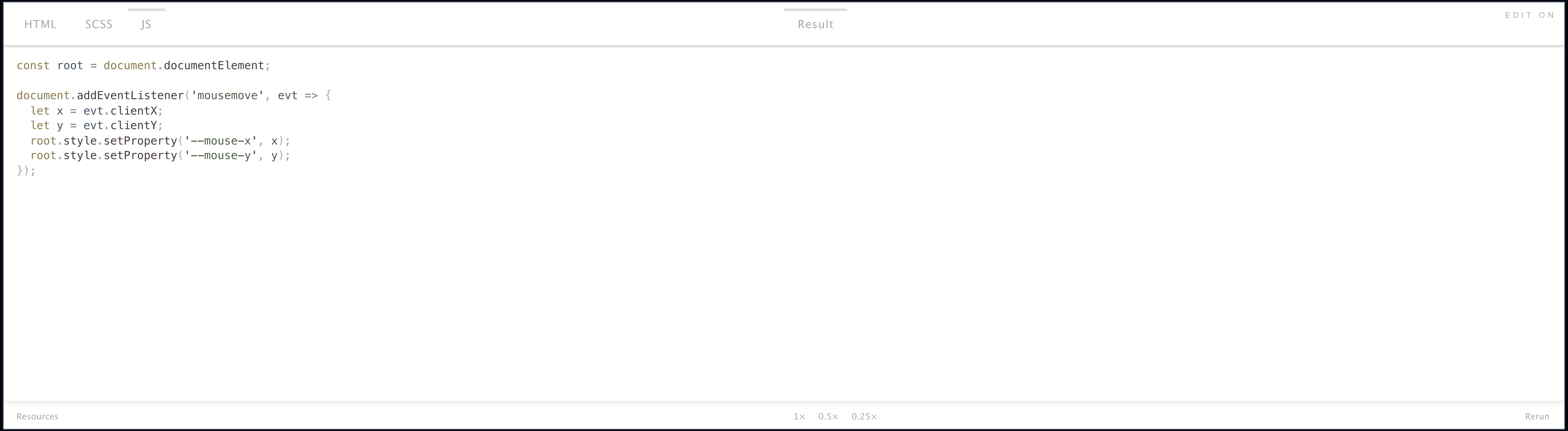
.component {
  background-color: lightness(var(--color-primary), 1.2);
}
```

How to combine SASS color functions and CSS Variables

Easier Javascript hooks

```
// get variable value from element
getComputedStyle(element).getPropertyValue('--variable-name')

// set variable value
element.style.setProperty('--variable-name', 'RELEVANT_PROPERTY_VALUE');
```



```
const root = document.documentElement;

document.addEventListener('mousemove', evt => {
  let x = evt.clientX;
  let y = evt.clientY;
  root.style.setProperty('--mouse-x', x);
  root.style.setProperty('--mouse-y', y);
});
```

Easier Javascript hooks

```
// get variable value from element
getComputedStyle(element).getPropertyValue('--variable-name')

// set variable value
element.style.setProperty('--variable-name', 'RELEVANT_PROPERTY_VALUE');
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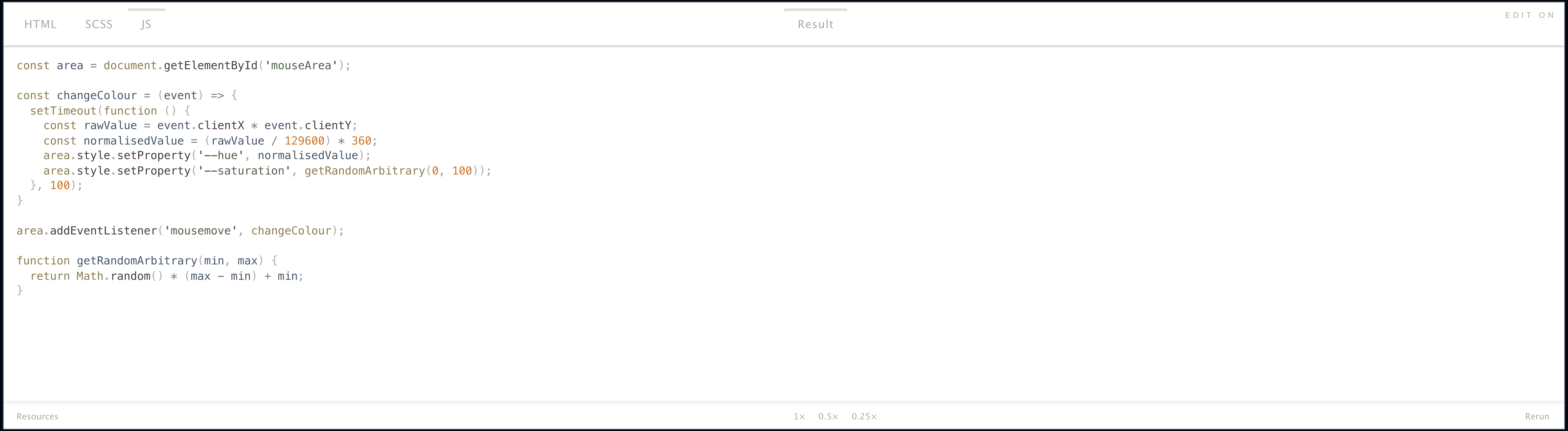


```
const area = document.getElementById('mouseArea');

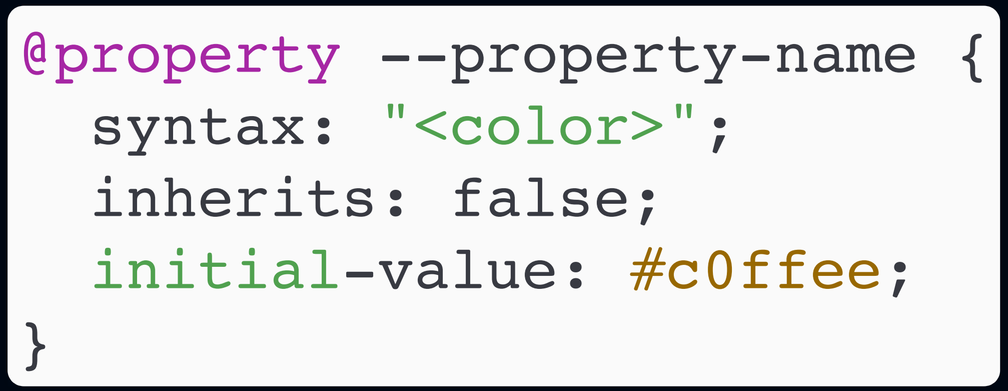
const changeColour = (event) => {
  setTimeout(function () {
    const rawValue = event.clientX * event.clientY;
    const normalisedValue = (rawValue / 129600) * 360;
    area.style.setProperty('--hue', normalisedValue);
    area.style.setProperty('--saturation', getRandomArbitrary(0, 100));
  }, 100);
}

area.addEventListener('mousemove', changeColour);

function getRandomArbitrary(min, max) {
  return Math.random() * (max - min) + min;
}
```

The @property at-rule

The `@property` rule represents a custom property registration directly in a stylesheet without having to run any JS.



```
@property --property-name {
  syntax: "<color>";
  inherits: false;
  initial-value: #c0ffee;
}
```

Animate gradients with custom properties

```
.result .animate {
  --angle: 0deg;
  background-image: linear-gradient(var(--
angle), coral, gold);
  animation: 4s rotate linear infinite;
}

@property --angle {
  syntax: '<angle>';
  initial-value: 0deg;
  inherits: false;
}

@keyframes rotate {
  to {
    --angle: 360deg;
  }
}
```

Further reading and references

- A user’s guide to CSS variables
- CSS Custom Properties for Cascading Variables Module Level 1
- Practical Use Cases For CSS Variables
- 7 Uses for CSS Custom Properties
- Lea Verou’s blog articles on CSS variables
- Exploring @property and its Animating Powers

Thank you

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