BUILDING EMPATHY
(AND ACCESSIBLE APPS)

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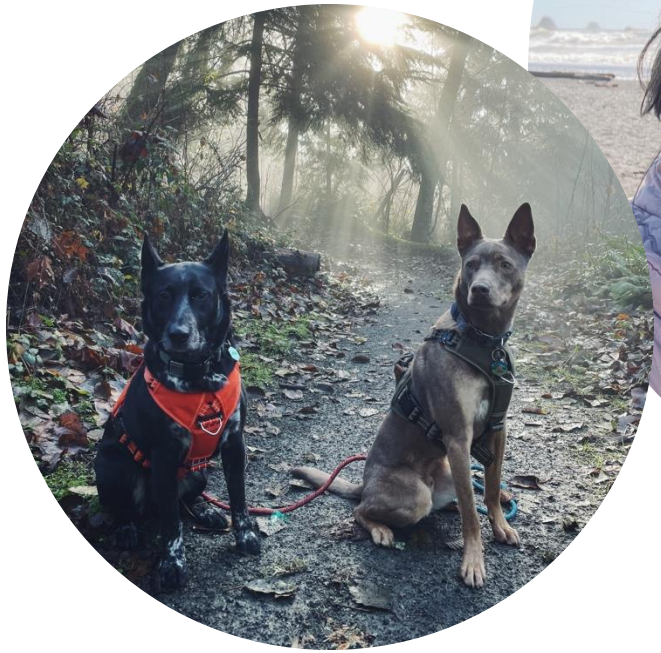
JSConfBP 2024

Hi 👋

I'm **Isabela Moreira**

@isabelacmor



✨GOALS✨

- What does “disabled” mean?
- What does “accessible” mean?
- Accessibility in design
- Accessibility in engineering

WHAT DOES “DISABLED” MEAN?

HAVING A *PHYSICAL* OR *MENTAL*
IMPAIRMENT THAT SUBSTANTIALLY LIMITS
ONE OR MORE MAJOR LIFE ACTIVITY

90%

of disabilities are invisible

United Educators: https://www.edurisksolutions.org/blogs/?Id=2147485070

1,000,000,000

people experience some form of disability

The World Bank: https://www.worldbank.org/en/topic/disability

WHAT DOES “ACCESSIBLE” MEAN?

Categories of disabilities

Permanent

- **Will not** change over time
- **Are not** dependent on a situation or environment

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Example:

Person without an arm

Categories of disabilities

Permanent

- **Will not** change over time
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Example:

Person without an arm

Temporary

- **Will / may** change or improve over time
- **Are not** dependent on a situation or environment

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Person without an arm

Temporary

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Example:

Person in a cast or brace

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Situational

- Not really a disability, but **need similar accommodations**

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Example:

Person in a cast or brace

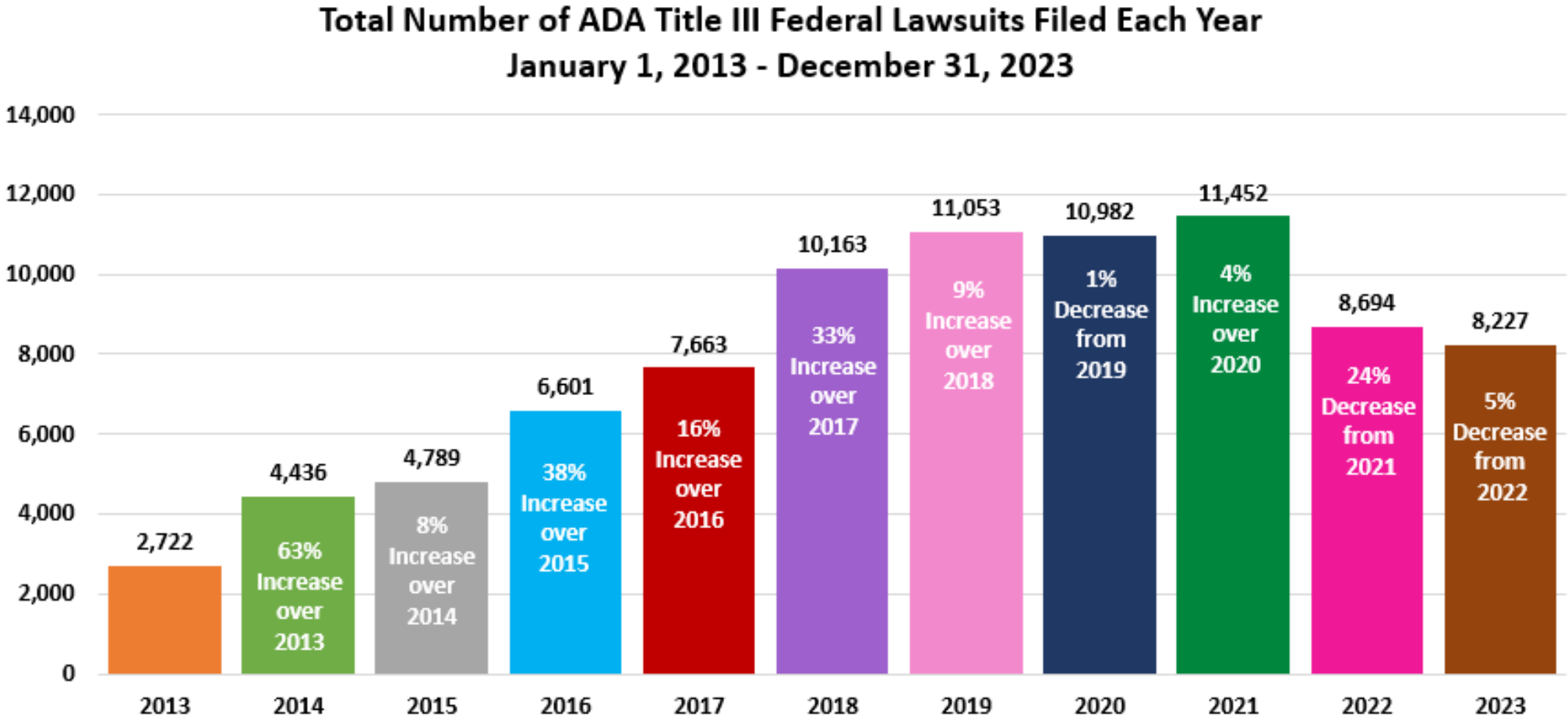
Situational

- Not really a disability, but **need similar accommodations**

Example:

Parent carrying a child in one arm

The problem today



[Plaintiffs Filed More than 8,200 ADA Title III Federal Lawsuits in 2023 | ADA Title III]

The problem today

In June 2017 a Florida federal trial court ruled in favor of the blind plaintiff, finding Winn-Dixie's inaccessible website violated the ADA, holding Winn-Dixie responsible for third party content on its website, and ordering, among other things, that the website be brought into conformance with the Web Content Accessibility Guidelines (WCAG) 2.0 Level AA by December 1, 2017.

As the Winn-Dixie Saga Finally Concludes in Florida, 181 Advocacy Groups Urge DOJ to Issue Website Accessibility Regulations | ADA Title III

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In April 2021, the Eleventh Circuit Court of Appeals overturned the trial court's verdict, finding that (1) the retailer did not violate the ADA because its website is not a place of public accommodation, and (2) the website did not pose an "intangible barrier" to his access to the goods, services, privileges, or advantages of Winn-Dixie's physical stores.

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HOW DO WE DO THIS?

HOW DO WE DO THIS?

- Start with design
- Follow semantic coding conventions
- Polish remaining accessibility concerns

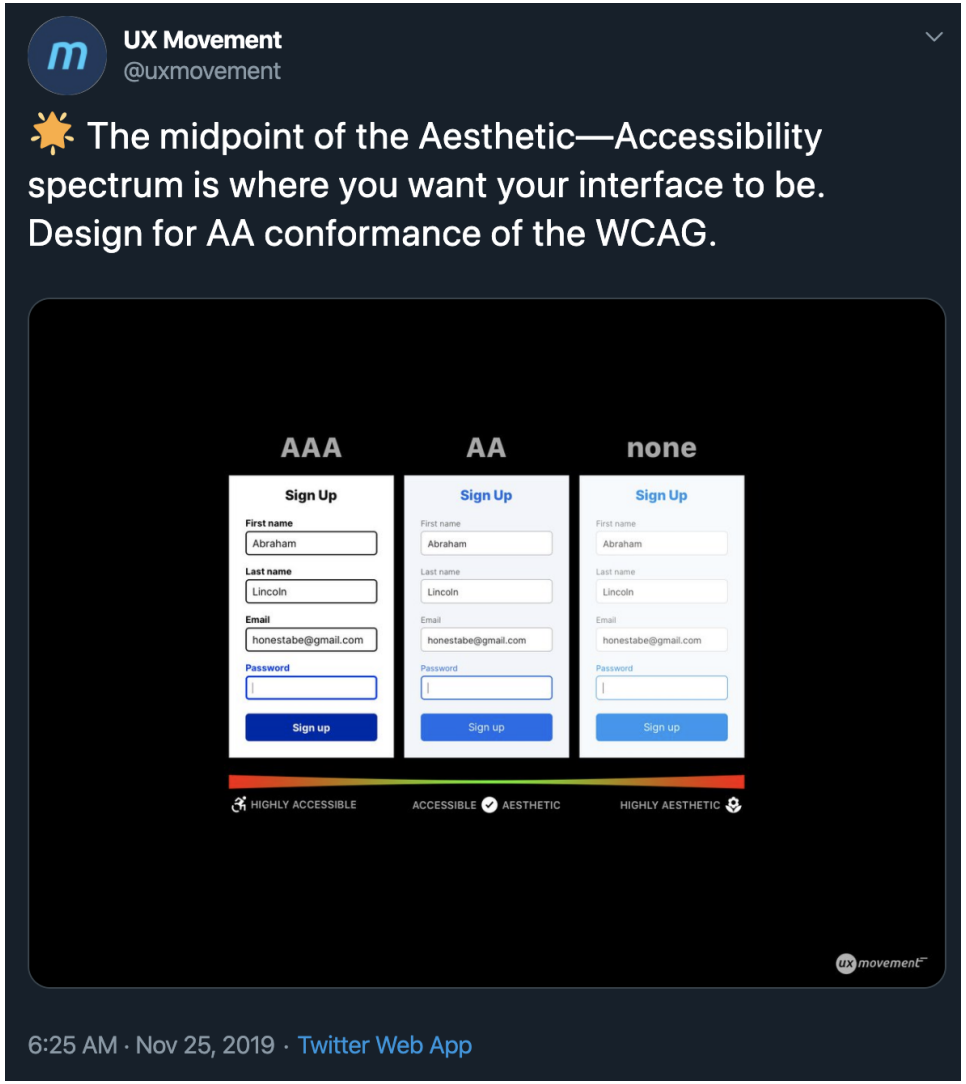
Start with design

Things to consider

- Auditory
- Cognitive
- Neurological
- Physical
- Speech
- Visual

Start with design

Accessible design can be aesthetic!



Start with design

🚫 Not accessible, not aesthetic

✅ Accessible! Aesthetic!

Start with design

Core principles

- Low vision and color blindness
- Contrast ratios
- Minimizing distractions

Start with design

Designing for low vision

Start with design

Designing for low vision

WCAG = Web Content Accessibility Guidelines

Level A **(minimum level of compliance)**
Level AA
Level AAA **(maximum level of compliance)**

Start with design

Designing for low vision

Level AA:

4.5:1, excluding large text* (3:1), decorative text, branding text

Level AAA

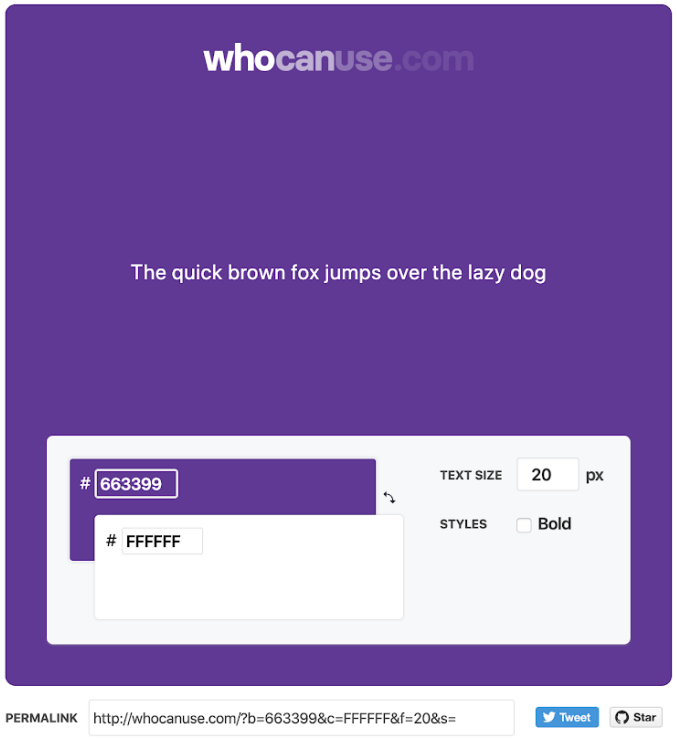
7:1, excluding large text* (4.5:1), decorative text, branding text

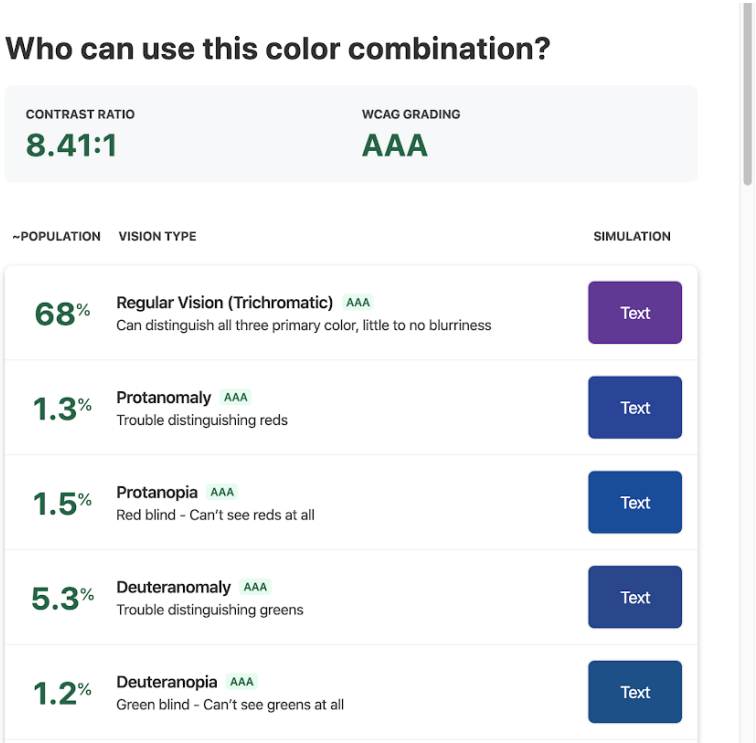
* Large text is >18pt or >14pt bold

Start with design

Designing for low vision

- Never rely on color alone to convey meaning





WhoCanUse: https://whocanuse.com/

Start with design

Designing for low vision

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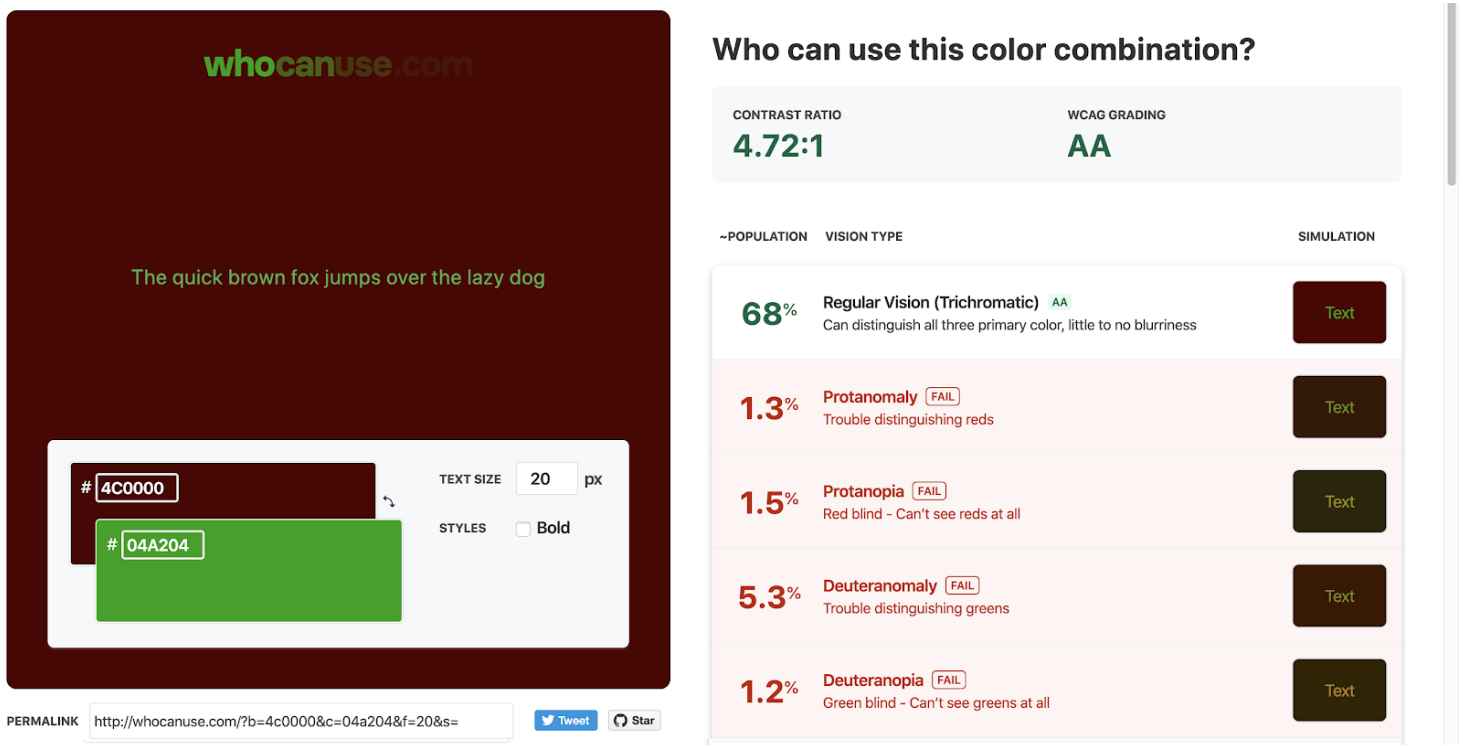

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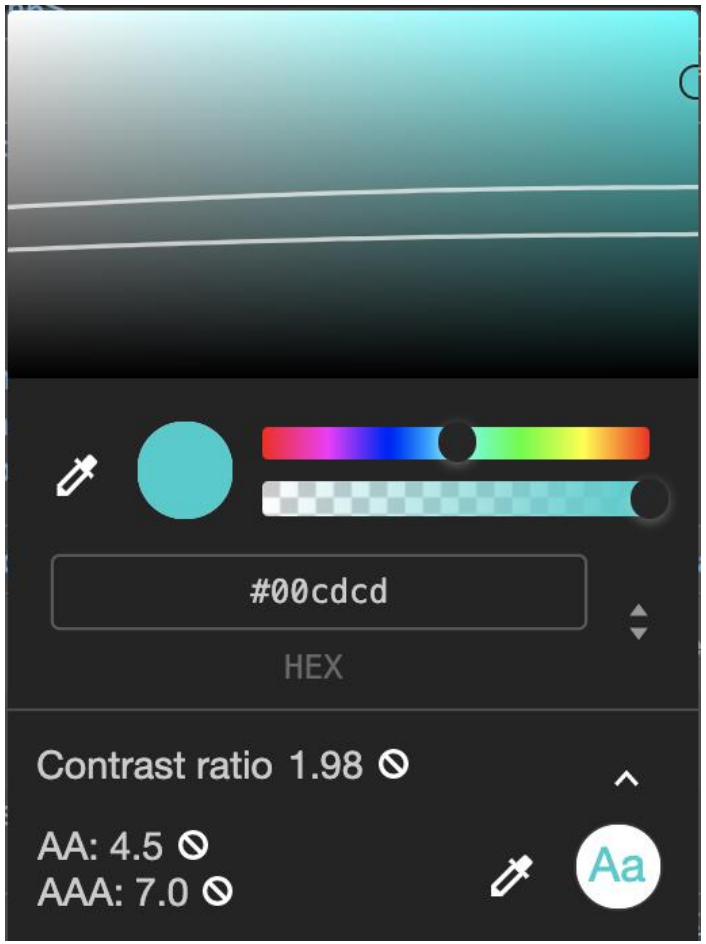

Start with design

Designing for low vision

“Designing Accessible Color Systems”, Stripe

https://stripe.com/en-no/blog/accessible-color-systems

Follow semantic coding conventions

Follow semantic coding conventions

```
<div>
   <span class=“header”>This is a header</span>
   <span class=“description”>This is a description</span>
   <div>Click me</div>
</div>
```

Follow semantic coding conventions

```
<div>
   <h1 class=“header”>This is a header</h1>
   <p class=“description”>This is a description</p>
   <a href=“https://isabela.dev”>Visit my website</div>
</div>
```

Follow semantic coding conventions

Alt text

```
<img src="dog.jpg" alt="A cattle dog on a hike" />
```

Follow semantic coding conventions

Alt text

```
<img src="dog.jpg" alt="A cattle dog on a hike" />
```

- Text should be functional
- Data-heavy images should provide alt content
- Every `img` needs an `alt` tag
  - But the `alt` tag can be an empty string is appropriate

Follow semantic coding conventions

Headings

```
<h1>...</h1>
<h2>...</h2>
    ...
<h6>...</h6>
```

Follow semantic coding conventions

Headings

```
<h1>...</h1>
<h2>...</h2>
    ...
<h6>...</h6>
```

- Heading levels should be hierarchical
- Every page should have at least one heading
- Every text that looks like a heading should be one
- Don’t use headings just for styling or sizing (use CSS 😱)

Follow semantic coding conventions

Links vs buttons

```
<a href=“https://google.com”>Visit my website</a>
```

vs

```
<button onClick={deleteItem}>Delete this item</button>
```

Follow semantic coding conventions

Links vs buttons

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<a href="https://google.com">Visit my website</a>
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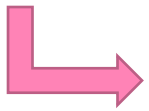

Navigating somewhere

vs

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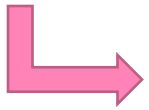

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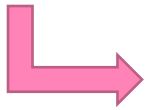


Performing an action on the same page

Follow semantic coding conventions

Links vs buttons

🚫
```
<a href="https://google.com">Read more</a> in the docs
```

✅
```
<a href="https://google.com">Read more
  <span class="visually-hidden">in the docs</span></a>
in the docs
```

Follow semantic coding conventions

Links vs buttons

```
<a href="https://google.com">Read more
        <span class="visually-hidden">in the docs</span></a>
   in the docs

.visually-hidden {
        position: absolute !important;
        height: 1px;
        width: 1px;
        overflow: hidden;
        clip: rect(1px 1px 1px 1px) /* IE6, IE7 */;
        clip: rect(1px, 1px, 1px, 1px);
        white-space: nowrap;
}
```

Testing accessibility

Nothing replaces manual testing!

Testing accessibility

Nothing replaces manual testing!

Windows:

- Complete guide to Narrator - Microsoft Support
- JAWS® – Freedom Scientific
- NV Access | About NVDA

Mac:

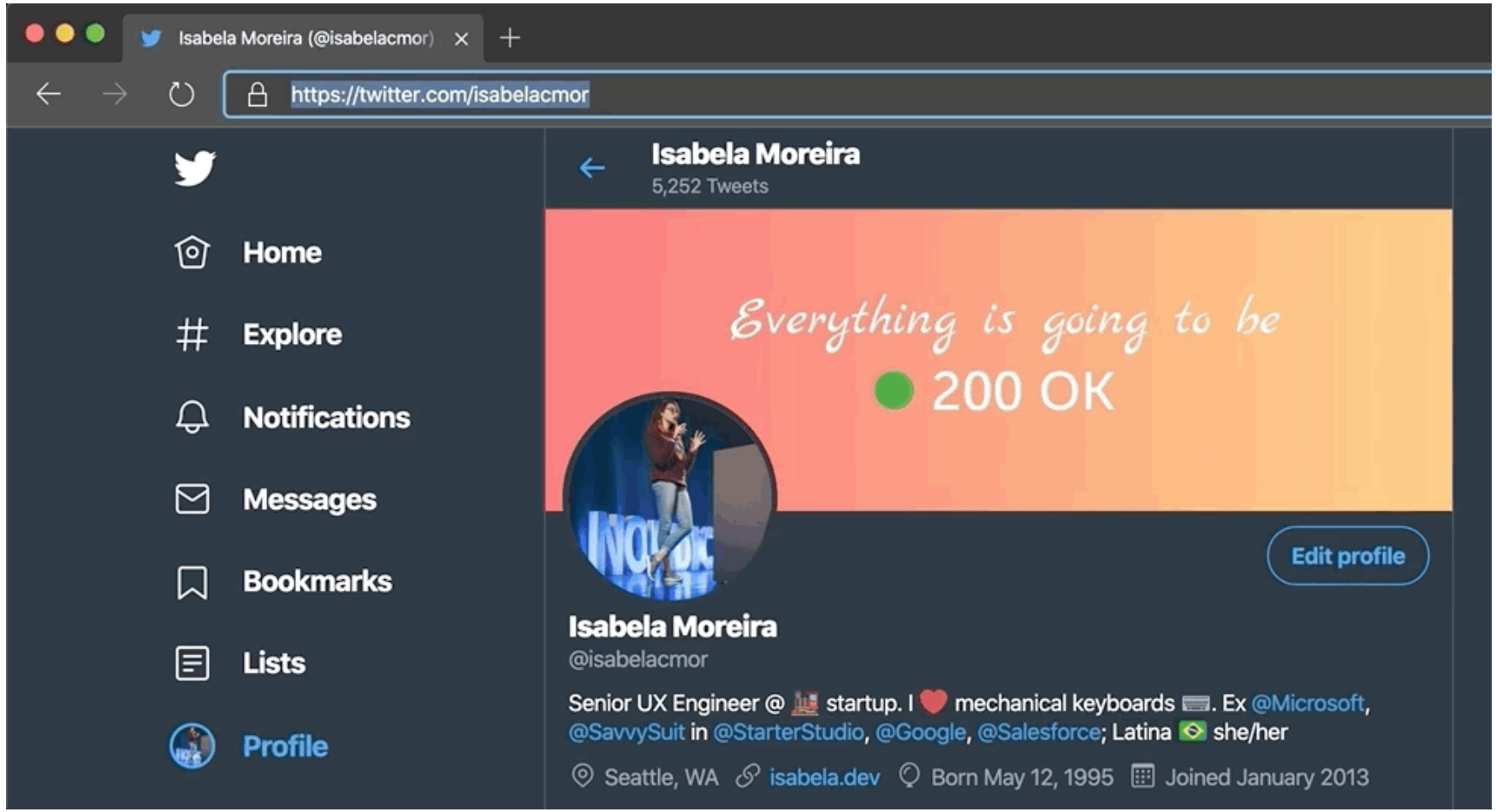
- VoiceOver User Guide for Mac - Apple Support

Testing accessibility

- Keyboard focus should be visible
- Keyboard focus should follow logical order
- Tab *into* and *away from* all interactive elements

Testing accessibility

Keyboard navigation



Testing accessibility

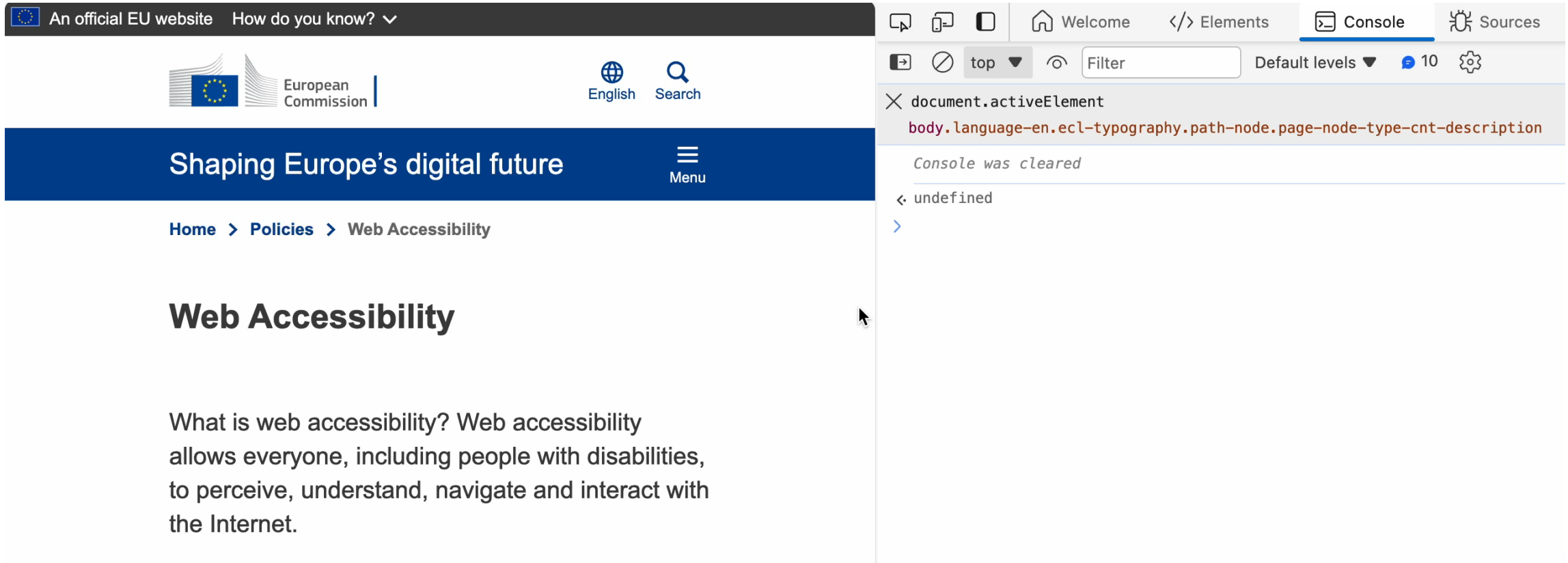
Visual focus

🚫
```
.a:focus {
        outline: 0 /* or none */;
}
```

✅
```
.a:focus {
        outline: 0 /* or none */;
        box-shadow: 0 0 0 2px #32dede;
}
```

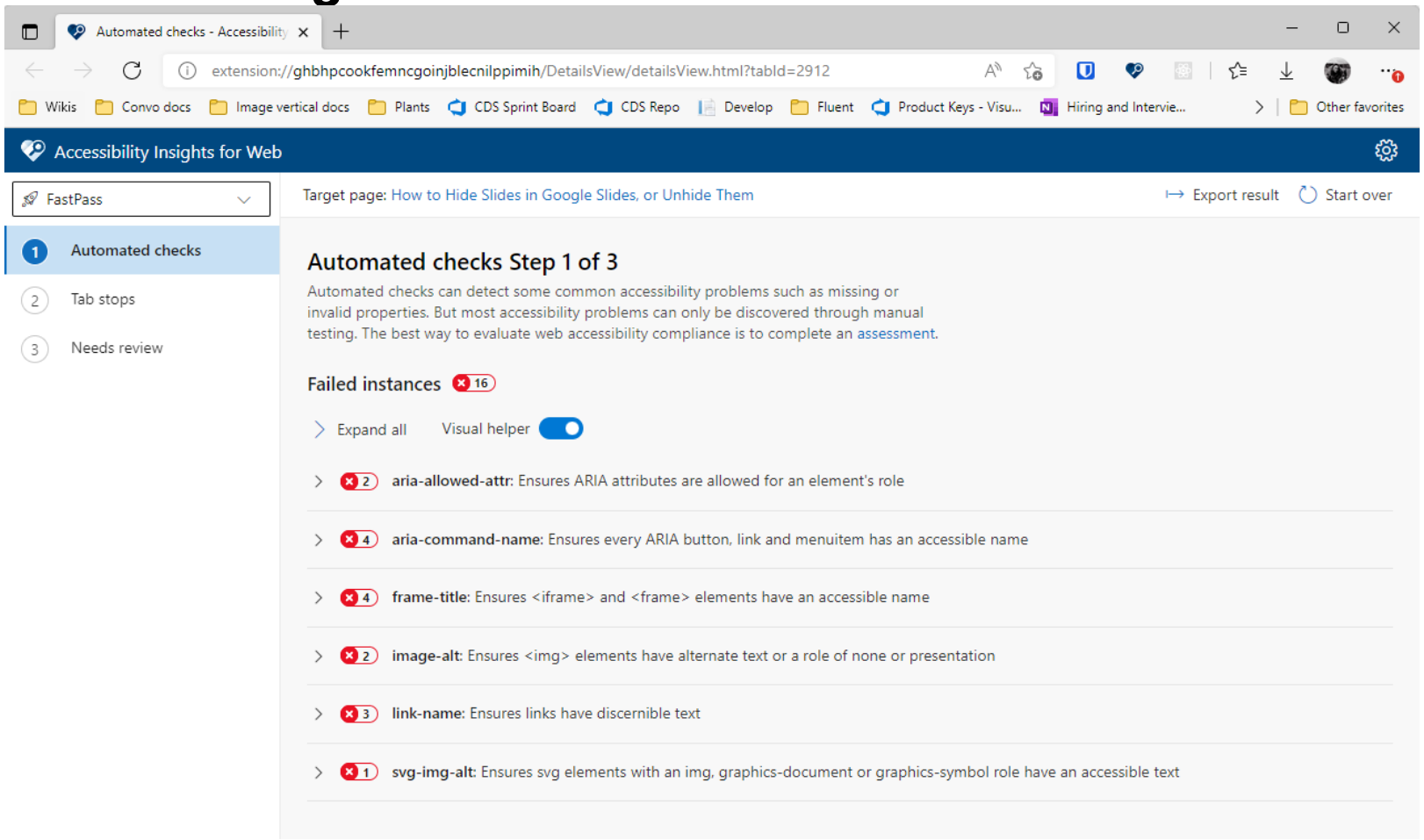
Testing accessibility

Lost focus



Testing accessibility

Semi-automated testing



Testing accessibility

Fully automated testing

- Playwright provides powerful tooling for automated e2e testing,

  including axe-core's accessibility testing engine

```
import { test, expect } from '@playwright/test';
import AxeBuilder from '@axe-core/playwright';

test.describe('homepage', () => {
   test('should not have any automatically detectable accessibility issues', async ({ page }) => {
      await page.goto('https://your-site.com/');

      const accessibilityScanResults = await new AxeBuilder({ page }).analyze();

      expect(accessibilityScanResults.violations).toEqual([]);
   });
});
```

WHEN WE DON'T PRIORITIZE ACCESSIBILITY, WE TAKE AWAY THE AGENCY OF DISABLED USERS.

THANK YOU

Isabela Moreira
@isabelacmor

Resources

- https://a11yproject.com/
- https://usecontrast.com/
- http://wave.webaim.org/extension/
- https://khan.github.io/tota11y/
- https://whocanuse.com/
- https://color.a11y.com/
- http://khroma.co/train/
- https://stripe.com/en-no/blog/accessible-color-systems
- https://www.figma.com/c/plugin/733159460536249875
- https://www.figma.com/c/plugin/733343906244951586
- https://colorable.jxnblk.com/00ffa2/004466
- https://webaim.org/techniques/keyboard/
- https://chrome.google.com/webstore/detail/web-developer/bfbameneiokkgbdmiekhjnmfkcnldhhm?hl=en-US
- https://medium.com/storybookjs/instant-accessibility-qa-linting-in-storybook-4a474b0f5347
- https://github.com/nickcolley/jest-axe
- https://github.com/paypal/AATT
- https://github.com/pa11y/pa11y
- https://accessibilityinsights.io/