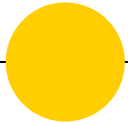


Building empathy & **accessible** apps





Hi 🙋

I'm **Isabela Moreira**

Twitter: **@isabelacmor**

Web: **isabela.dev**



What does “disabled” mean?



What does “disabled” mean?



*A person who has a physical or
mental impairment that
substantially limits one or more
major life activity.*

“

1,000,000,000

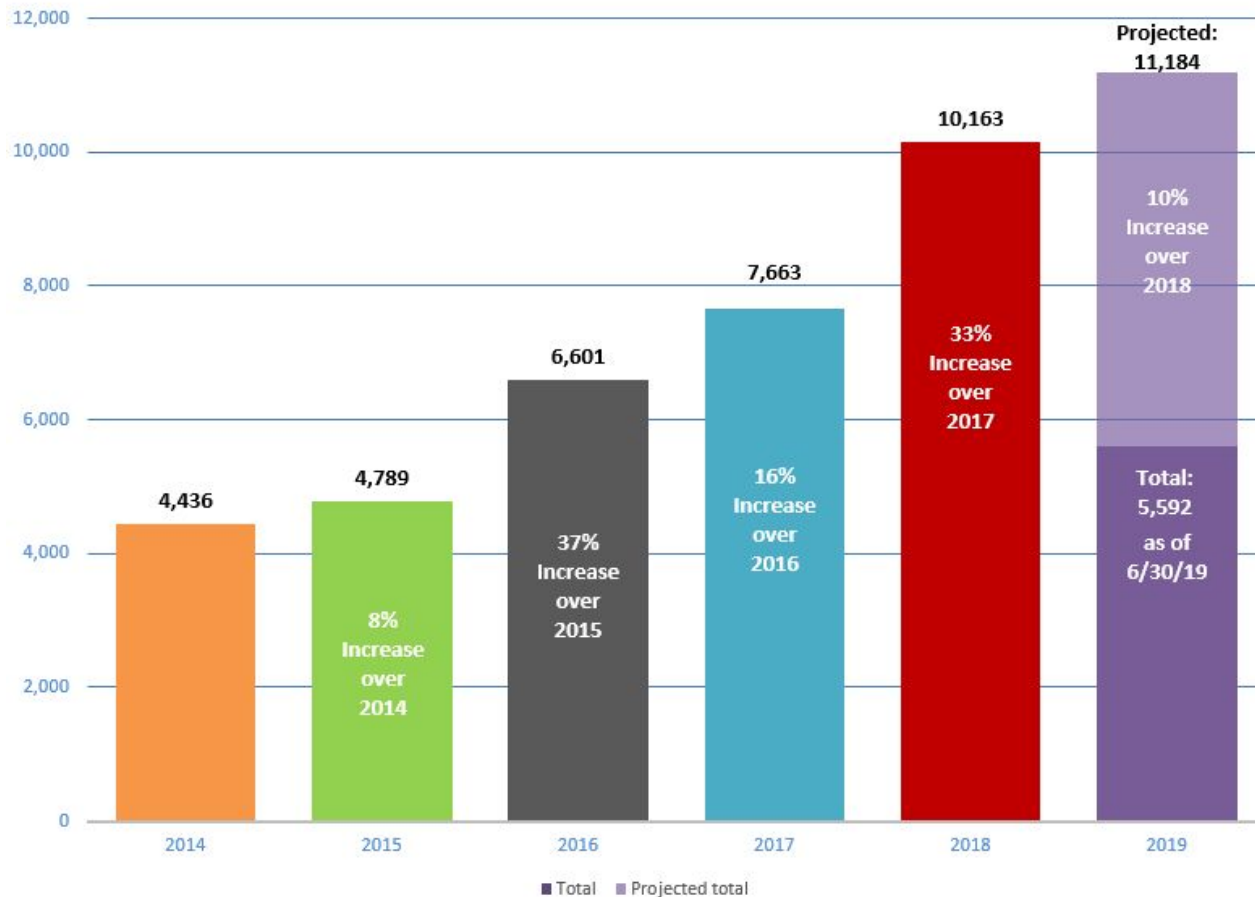
people experience some form of disability



90%

of disabilities are invisible

ADA Title III Lawsuits in Federal Court Jan. 2014 - Jun. 2019





So how do we do this?



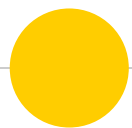
So how do we do this?

- Follow coding conventions
- Polish remaining accessibility concerns



Accessibility considerations

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



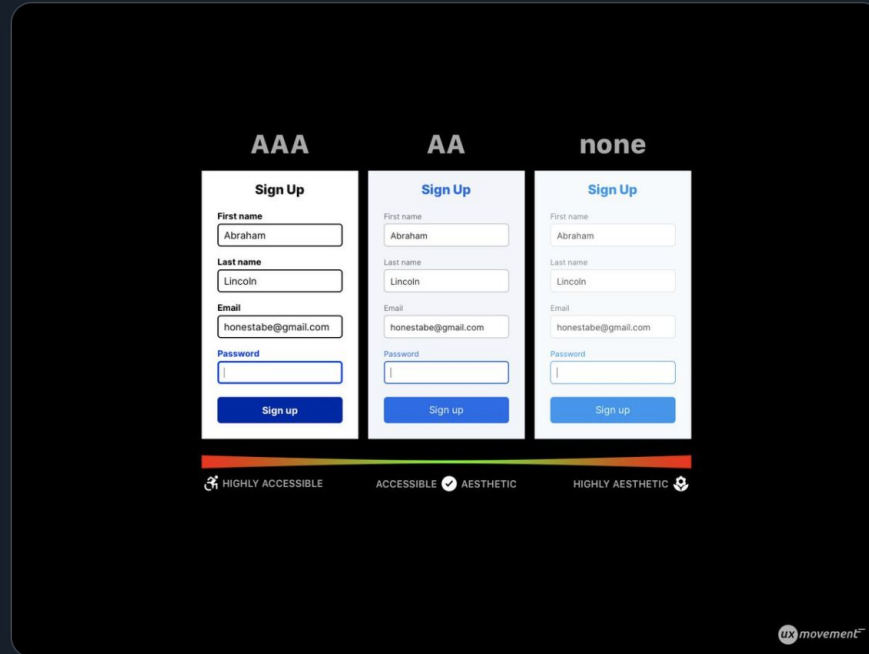
Starting with design



UX Movement
@uxmovement



☀️ The midpoint of the Aesthetic—Accessibility spectrum is where you want your interface to be. Design for AA conformance of the WCAG.





UX Movement
@uxmovement

🌟 The midpoint of the Aesthetic—Accessibility spectrum is where you want your interface to be. Design for AA conformance of the WCAG.

AAA	AA	none
Sign Up First name Abraham Last name Lincoln Email honestabe@gmail.com Password [] Sign up	Sign Up First name Abraham Last name Lincoln Email honestabe@gmail.com Password [] Sign up	Sign Up First name Abraham Last name Lincoln Email honestabe@gmail.com Password [] Sign up

🦿 HIGHLY ACCESSIBLE ACCESSIBLE AESTHETIC HIGHLY AESTHETIC 🎨

uxmovement

6:25 AM · Nov 25, 2019 · Twitter Web App



UX Movement
@uxmovement

📄 Article: "In general, the more accessible an interface is, the less aesthetic appeal it will have."

❄️ Accessibility snowflakes: "That's not true because it hurts my overly sensitive feelings."

🖥️ Reality:

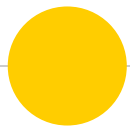


8:49 AM · Dec 7, 2019 · Twitter Web App



Starting with design

- Color blindness
- Contrast ratios
- Choosing colors
- Minimizing distractions

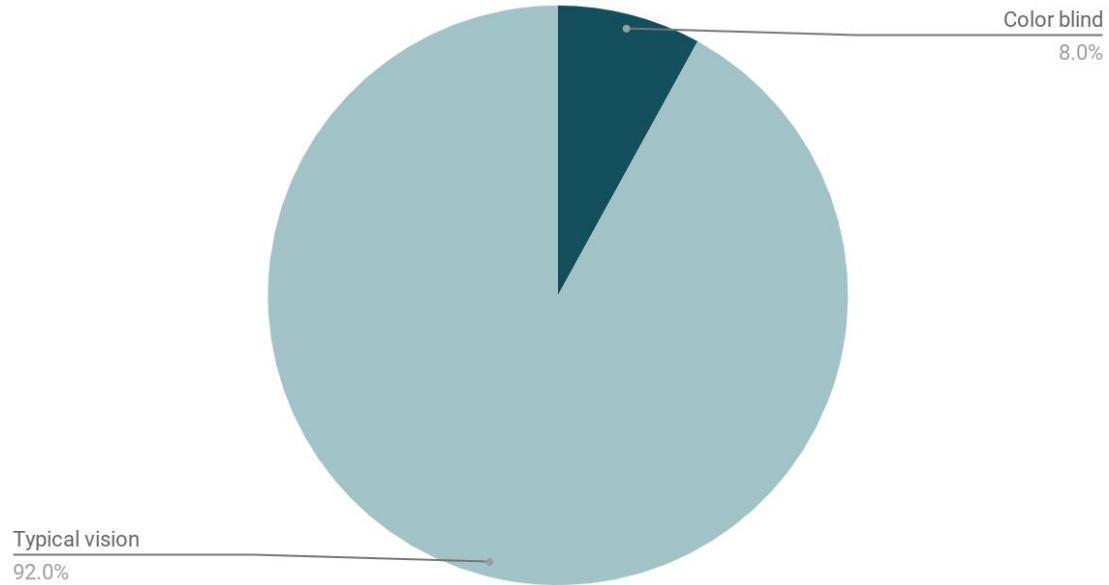


Designing for: **Color blindness**



Designing for: **Color blindness**

Men





Designing for: **Color blindness**

Never rely on color alone to convey meaning



Designing for: **Color blindness**

my category 44863

my category 44863

my category 44863

my category 44863



Designing for: Color blindness

whocanuse.com

The quick brown fox jumps over the lazy dog

663399

FFFFFFFF

TEXT SIZE 20 px

STYLES ☐ Bold

PERMALINK <http://whocanuse.com/?b=663399&c=FFFFFF&f=20&s=>

[Tweet](#) [Star](#)

Who can use this color combination?

CONTRAST RATIO		WCAG GRADING
8.41:1		AAA
~POPULATION	VISION TYPE	SIMULATION
68%	Regular Vision (Trichromatic) AAA Can distinguish all three primary color, little to no blurriness	Text
1.3%	Protanomaly AAA Trouble distinguishing reds	Text
1.5%	Protanopia AAA Red blind - Can't see reds at all	Text
5.3%	Deuteranomaly AAA Trouble distinguishing greens	Text
1.2%	Deuteranopia AAA Green blind - Can't see greens at all	Text



Designing for: Color blindness



Who can use this color combination?

CONTRAST RATIO

4.72:1

WCAG GRADING

AA

~POPULATION VISION TYPE

SIMULATION

68%

Regular Vision (Trichromatic) AA

Can distinguish all three primary color, little to no blurriness

Text

1.3%

Protanomaly FAIL

Trouble distinguishing reds

Text

1.5%

Protanopia FAIL

Red blind - Can't see reds at all

Text

5.3%

Deuteranomaly FAIL

Trouble distinguishing greens

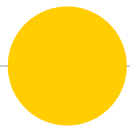
Text

1.2%

Deuteranopia FAIL

Green blind - Can't see greens at all

Text



Designing for:
Low vision



Designing for:
Low vision

WCAG = Web Content Accessibility Guidelines

Level A (minimum level of compliance)

Level AA

Level AAA (maximum level of compliance)



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



Designing for:
Low vision

my category

44863

my category

44863

A11y - Color Contrast Checker



1 error(s) found in Frame 1

We're listing them below.

Normal fonts (< 19px)

AA compliant: 4.5:1

AAA compliant: 7:1

Large fonts (19px +)

AA compliant: 3:1

AAA compliant: 4.5:1

A

Text lightness



Background lightness



Reset

Contrast Ratio

6.69



AA



AAA

A11y Color Contrast Checker Figma plugin:

<https://www.figma.com/c/plugin/733159460536249875/A11y---Color-Contrast-Checker>

@isabelacmor



Designing for:
Low vision



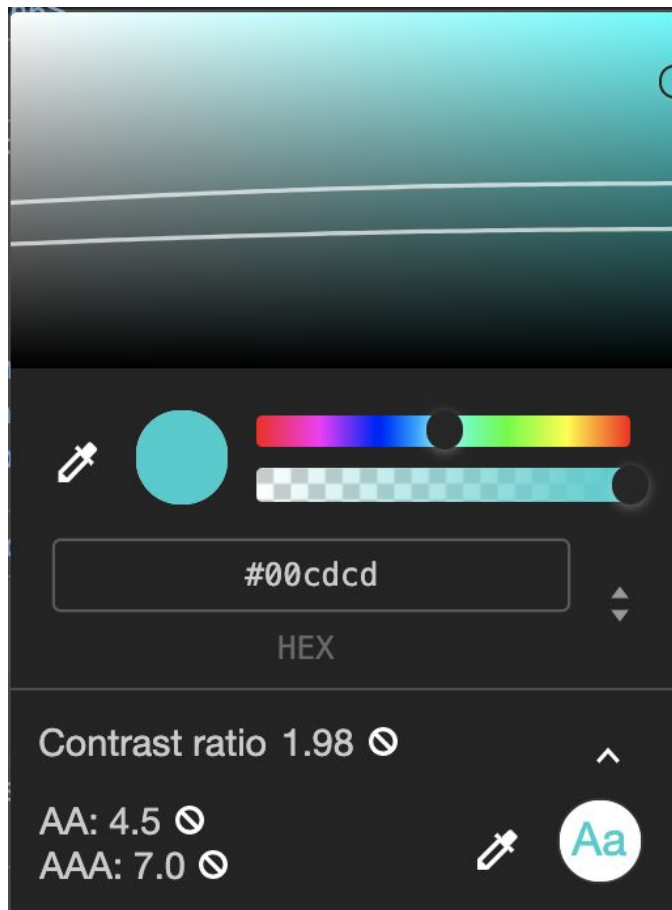
Color Contrast Accessibility Validator
WCAG 2.1 AA SC 1.4.3 Test for Color Contrast

Test a webpage

Check Contrast



Designing for: **Low vision**





Designing for: **Low vision**

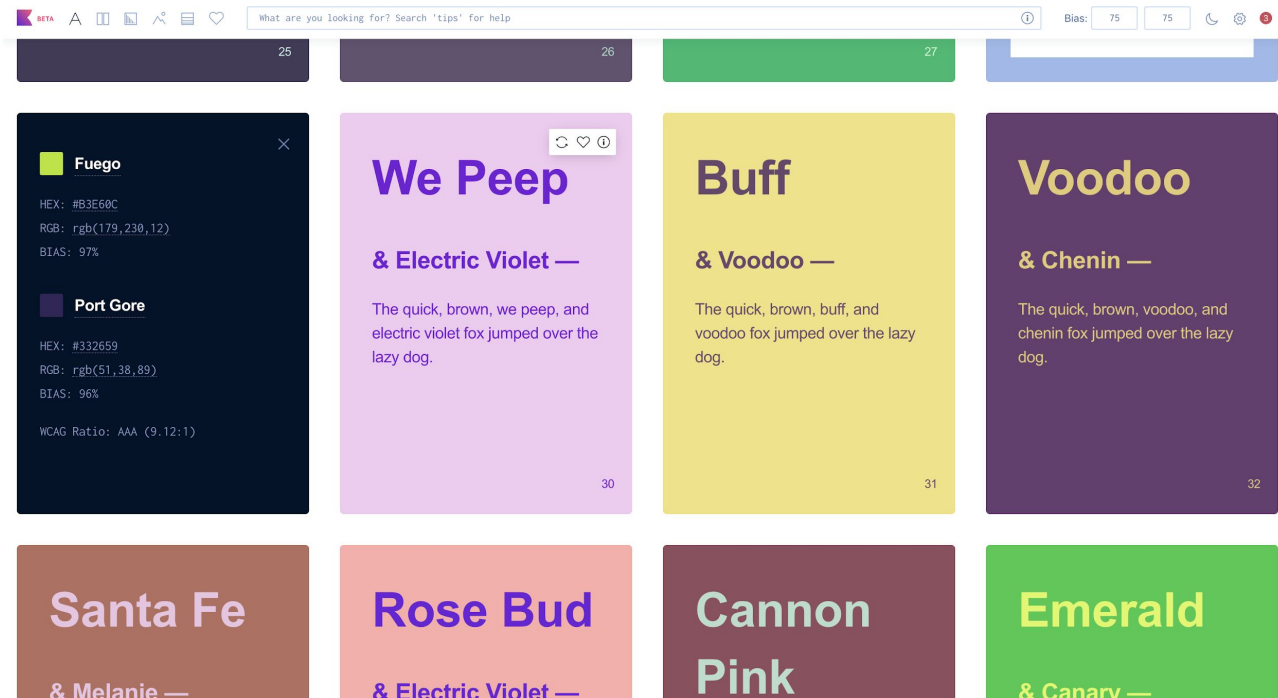


Designing for: **Low vision**

The screenshot shows the Colorable website interface. At the top, the color is displayed as 'Aa 7.84 AAA' in a large, bold, light blue font. To the right of this, there are social media icons for 'Star' (1,544) and 'Tweet'. Below the color name, a paragraph explains contrast: 'Contrast is the difference in luminance or color that makes an object (or its representation in an image or display) distinguishable. In visual perception of the real world, contrast is determined by the difference in the color and brightness of the object and other objects within the same field of view.' Below this text, there are two tabs: 'Text' (selected) and 'Background'. Under the 'Text' tab, the hex code '#00ffa2' is shown in a large font. Below the hex code, there are three sliders: 'Hue 158°', 'Saturation 1', and 'Lightness 0.5'. At the bottom, there are two buttons: 'Reverse' and 'Random'.



Designing for: Low vision

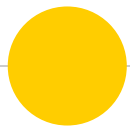




Designing for:
Low vision

“Designing Accessible Color Systems”, Stripe

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



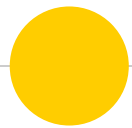
Designing for:
Attention & focus



Designing for:

Attention & focus

- Watch out for:
 - Moving
 - Blinking
 - Scrolling
 - Auto-updating
- Keep lines short
 - Max 45–75 characters per line (approx. 20–35 em width)



Semantic implementation



Semantic implementation

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



Semantic implementation

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



Semantic implementation:

Page titles

```
<title>About me</title>
```



Semantic implementation:

Page titles

<title>About me**</title>**

- Title adequately & briefly describes the content
- Title is unique in the website
- Title front loads important information

App Name | About Us
App Name | Contact Us

vs

About Us | App Name
Contact Us | App Name



Semantic implementation:

Alt text

```

```




Semantic implementation:

Alt text

```

```

- 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 if appropriate)

Accessible vs Non-Accessible alt text

Not accessible

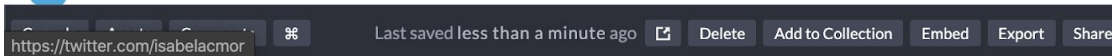


× visited, link, image, /twitter.png

Slightly accessible



Accessible



```
<a href="https://twitter.com/isabelacmor">  
    
</a>
```

Accessible vs Non-Accessible alt text

Not accessible



× visited, link, image, twitter icon

Slightly accessible



Accessible



https://twitter.com/isabelacmor Last saved less than a minute ago Delete Add to Collection Embed Export Share

```
<a href="https://twitter.com/isabelacmor">
  
</a>
```

Accessible vs Non-Accessible alt text

Not accessible



× visited, link, image, Go to Isabela's twitter.

Slightly accessible



Accessible



```
<a href="https://twitter.com/isabelacmor">  
    
</a>
```



Semantic implementation:

Headings

`<h1>...</h1>`

`<h2>...</h2>`

`...`

`<h6>...</h6>`



Semantic implementation:

Headings

- 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 🤖)



Semantic implementation:

Headings

- Mac
 - Turn on VoiceOver: $\text{⌘} + \text{F5}$
 - Navigate headings: $\text{⌘} + \text{⌘} + \text{⌘} + \text{H}$
- Windows
 - Turn on Narrator: $\text{⌘} + \text{Ctrl} + \text{Enter}$
 - Navigate headings: Caps+F6 then arrow keys



Semantic implementation: Headings

Styles: OFF ☐ ON ☒

Structure

    
Summary Details Reference **Structure** Contrast



Main



"Skip Navigation" Links



Navigation



Article Contents



Overview



Creating "Skip Navigation"

Links



Visible links at the top of the



Semantic implementation: **Links vs buttons**

```
<a href="https://isabela.dev">Visit my website</a>
```

VS

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



Semantic implementation: **Links vs buttons**

```
<a href="https://isabela.dev">Visit my website</a>
```

VS



Navigating somewhere

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



Semantic implementation: Links vs buttons

```
<a href="https://isabela.dev">Visit my website</a>
```

VS



Navigating somewhere

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



*Performing an action on
the same page*



Semantic implementation: **Links vs buttons**



`Visit my website`



`Click here`



`Read more about this`



Semantic implementation: **Links vs buttons**

❌ `Read more` about this

✅ `
 Read more about this
` about this



Semantic implementation: **Links vs buttons**

```
.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;  
}
```



Semantic implementation: **Links vs buttons**



<button>

```

```

```
</button>
```



<button>

```
<span class="visually-hidden">Filter</span>
```

```

```

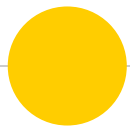
```
</button>
```



Semantic implementation: **Links vs buttons**

- Look out for any **<a>** with an empty **href**

```
<a href="" onClick={doSomething}>I'm a bad link</a>
```

Keyboard navigation & visual focus

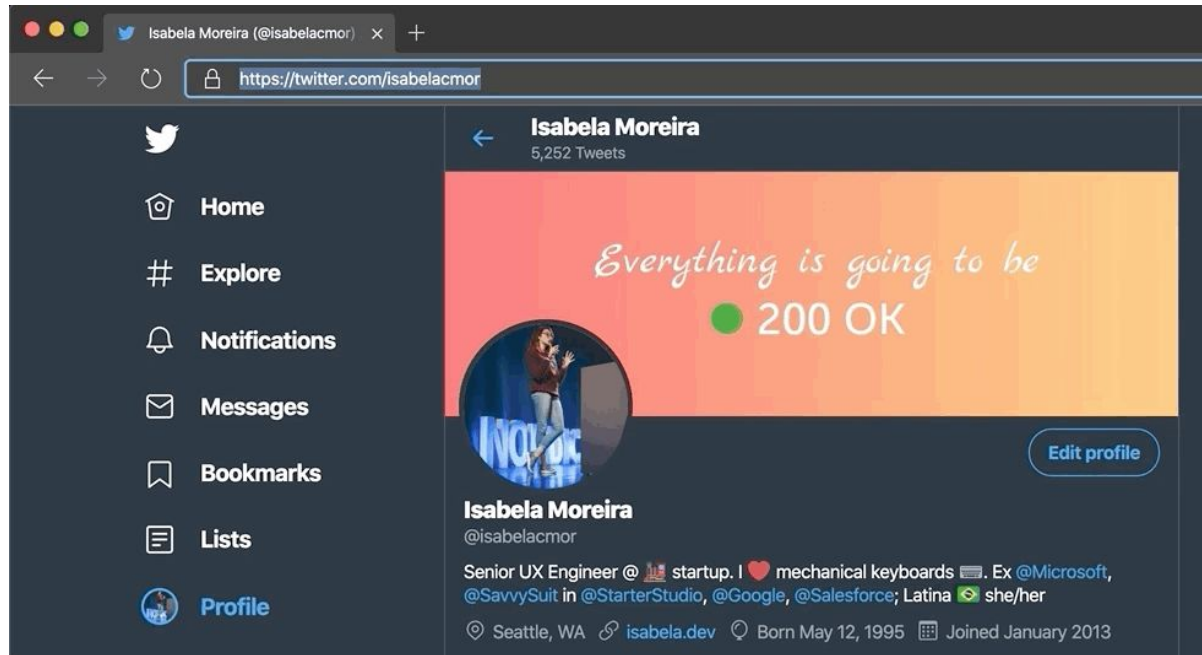


Keyboard navigation & visual focus

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



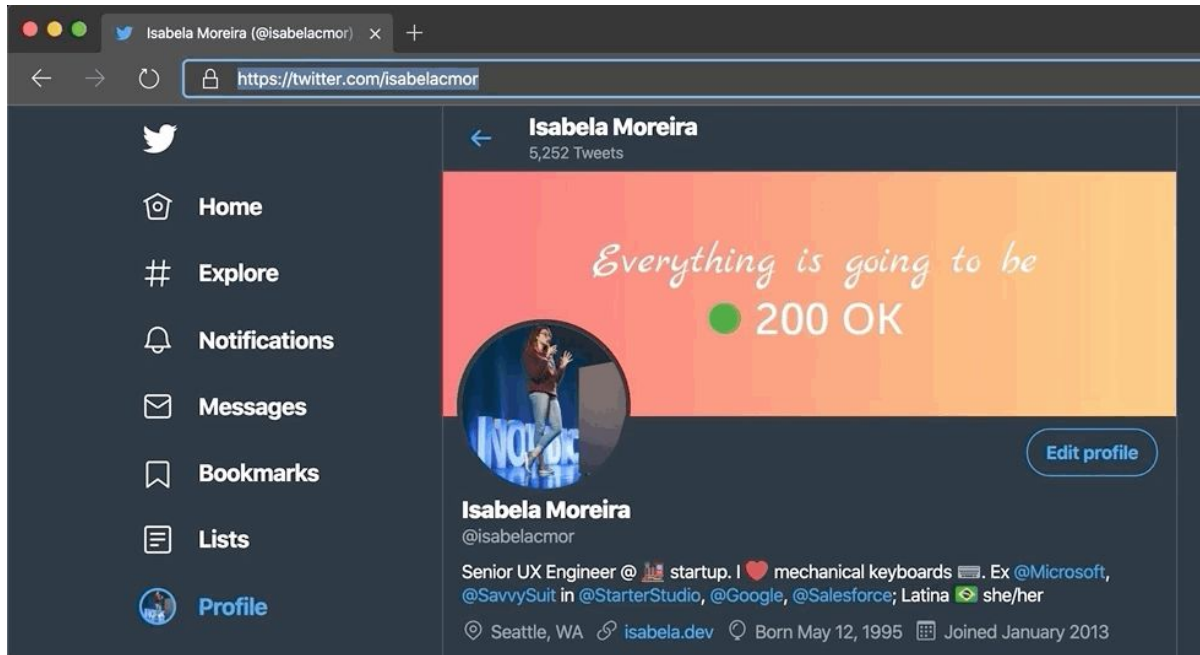
Keyboard navigation & visual focus



- Tab
 - move forward
- Shift+tab
 - move backward
- Arrows
 - move within elements
- Enter / space
 - select items



Keyboard navigation & visual focus



Label *

Label *

Focus



Keyboard navigation & visual focus

Not accessible

[Go to my Twitter](#)

Accessible

[Go to my Twitter](#) [Go to my Twitter](#)

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

*When we don't prioritize
accessibility, we take away the
agency of disabled users.*

“

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/bfbameneiokkgbdmiekhjnmfkcnldhbm?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>