HTML

HTML ENABLES

Multi device web

HTML ENABLES

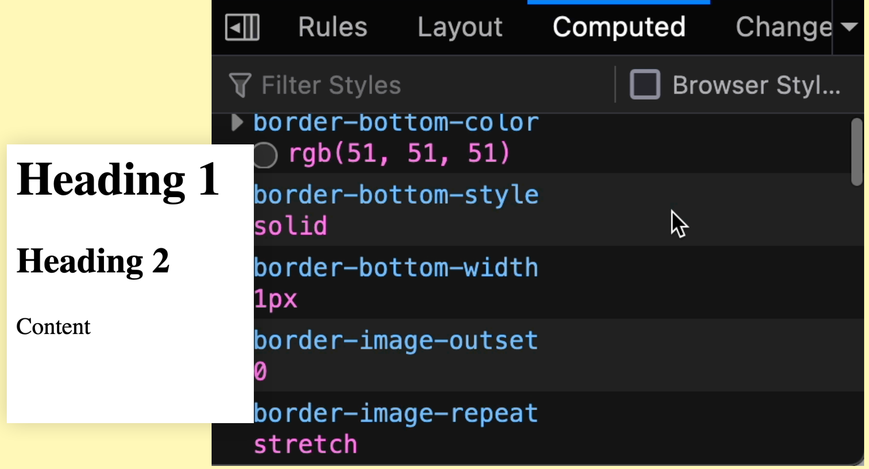
@hdv

This NeXT machine was used to develop and run the first WWW server, multimedia browser and web editor

Multi device web

HTML ENABLES

Multi device web

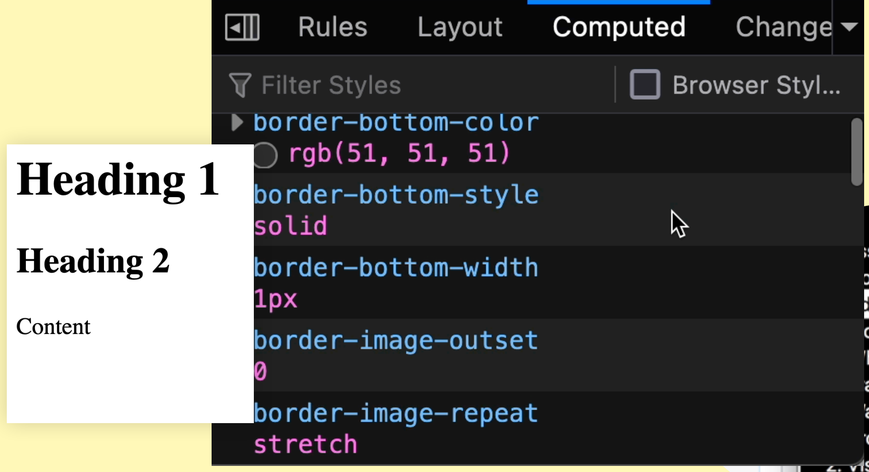


Default stylesheets

HTML ENABLES

@hdv

Multi device web



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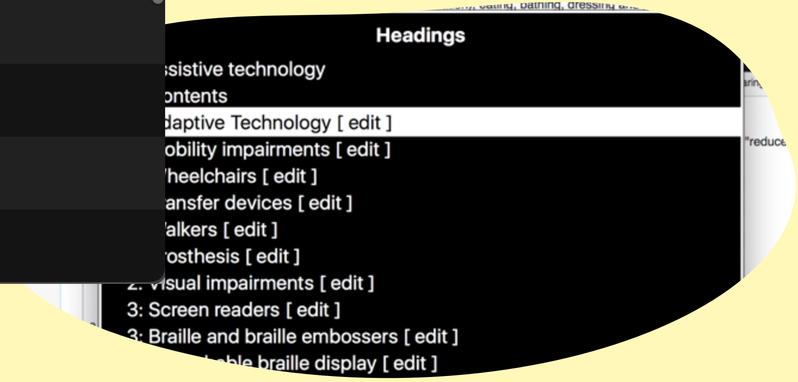
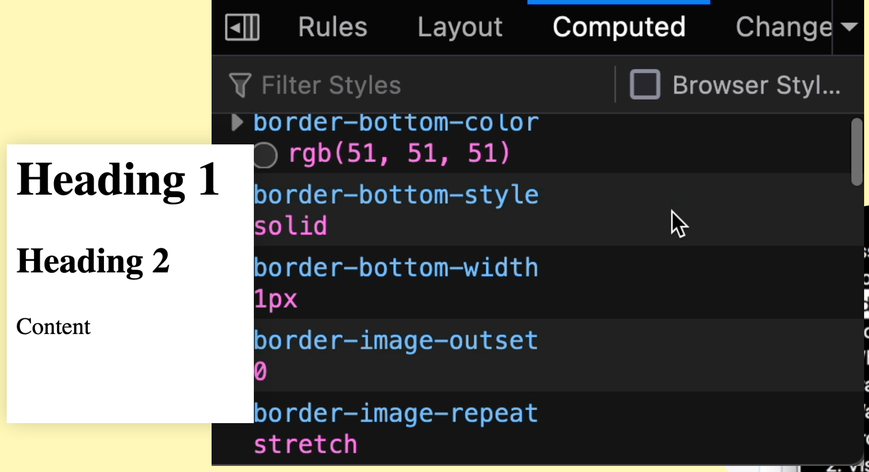


'Browse by heading'

HTML ENABLES

@hdv

Multi device web



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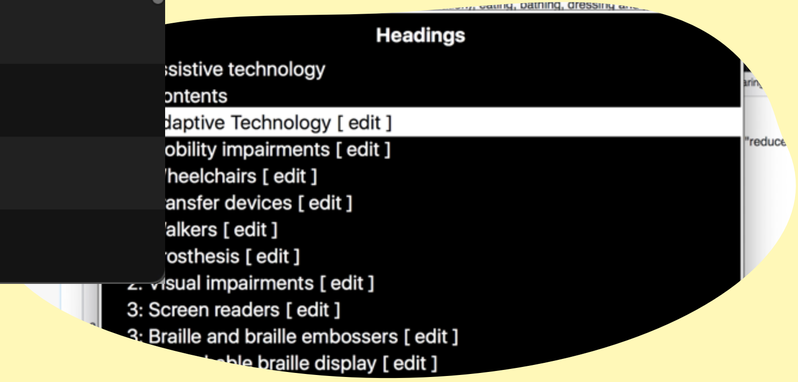
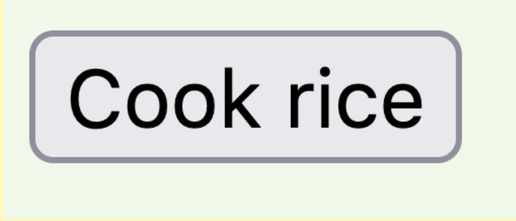


'Browse by heading'

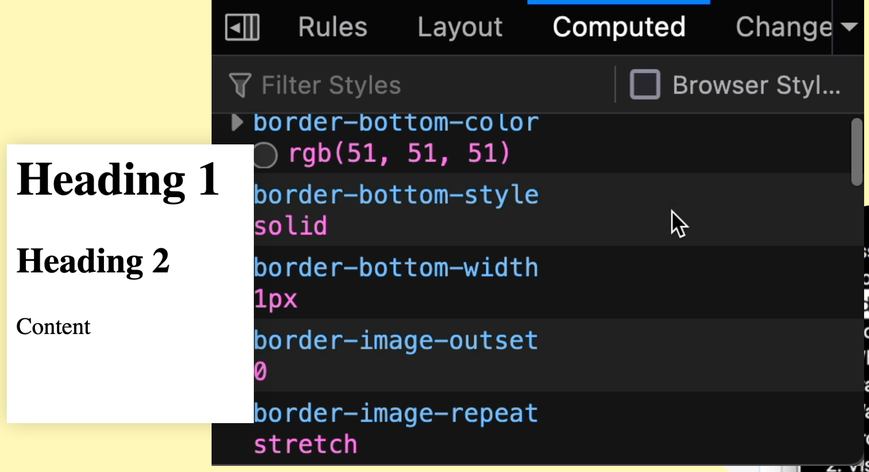
HTML ENABLES

Default behaviour



@hdv

Multi device web



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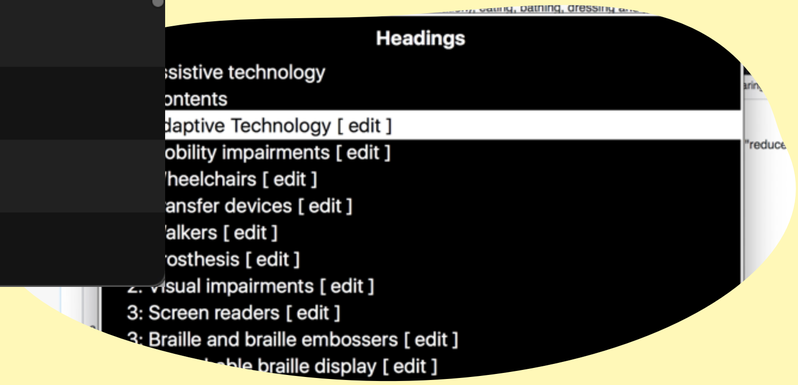
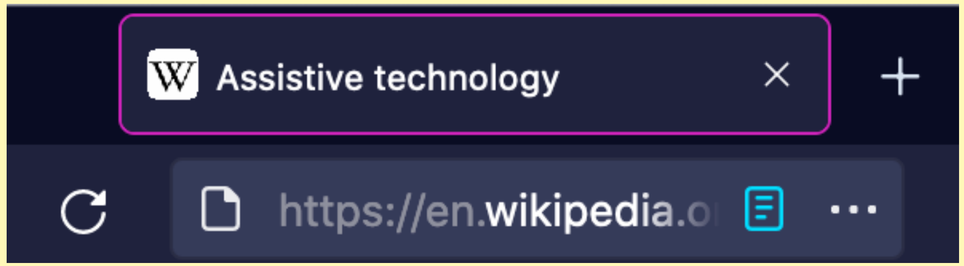


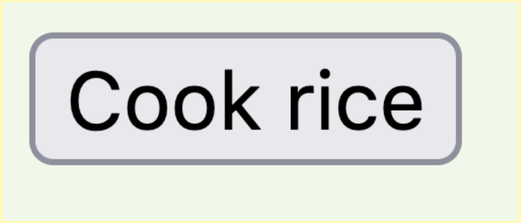
'Browse by heading'

HTML ENABLES

Reader mode

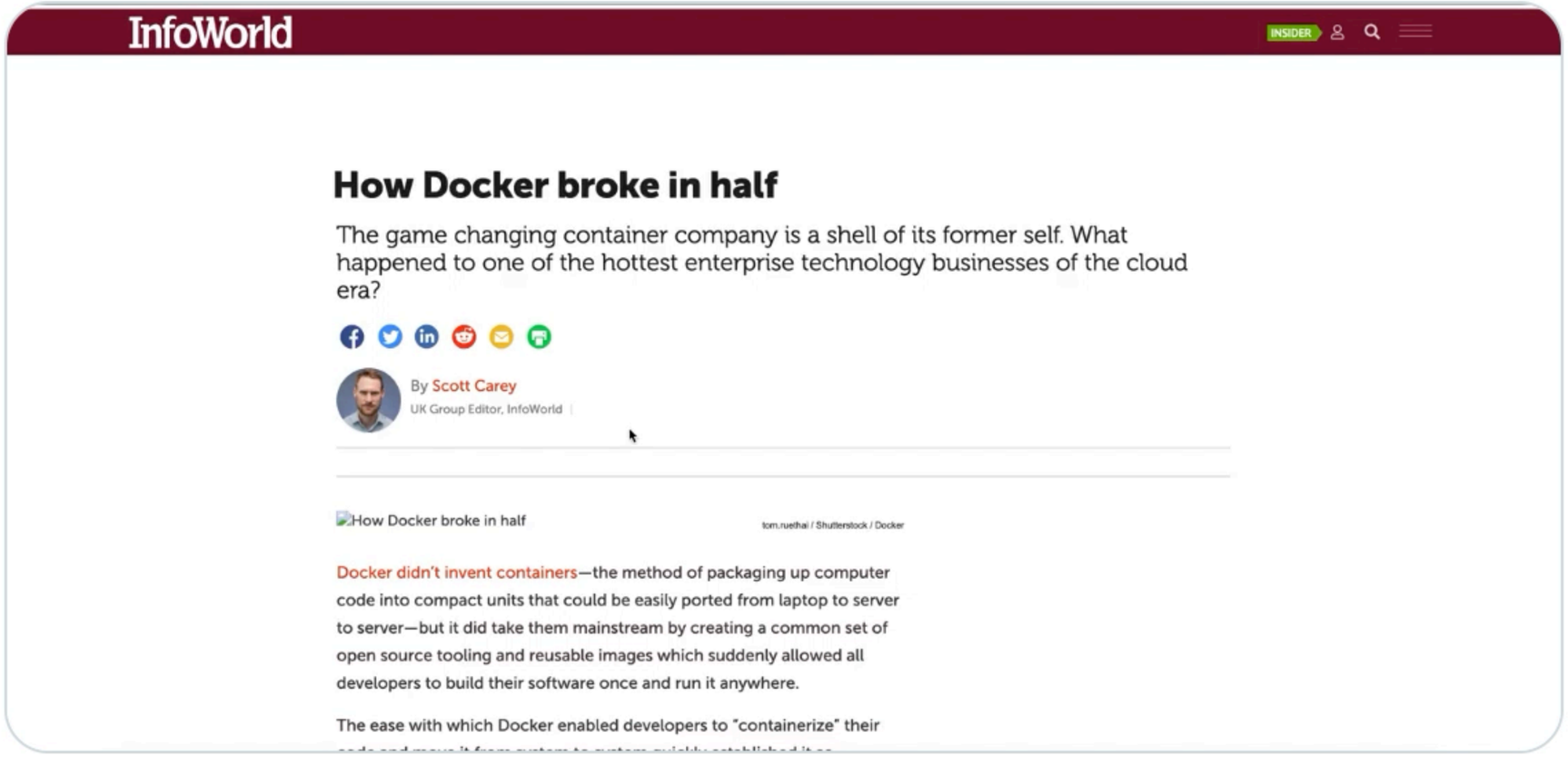


Default behaviour



Andrej Karpathy
@karpathy

Browsing the web, 2021



6:47 AM · Sep 9, 2021 · Twitter Web App

@hdv

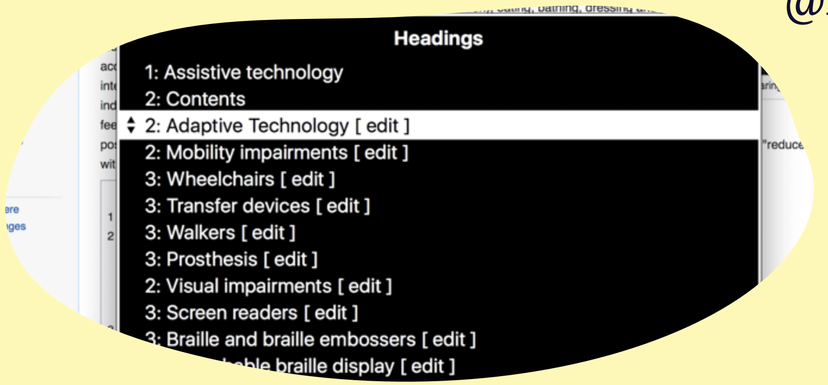
Multi device web

Heading 1

Heading 2

Content

Default stylesheets



‘Browse by heading’

HTML ENABLES

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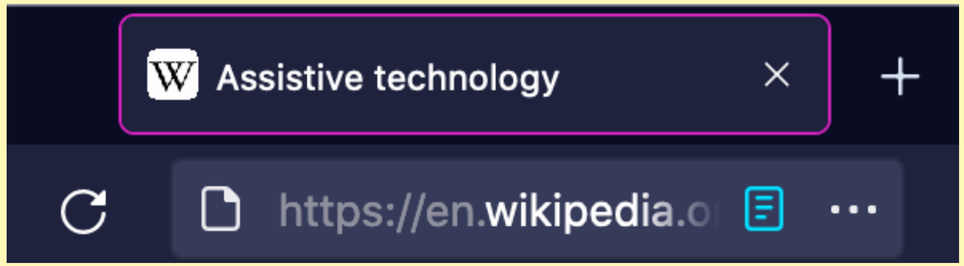


Default behaviour

Cook rice

@hdv@front-end.social

IT'S THE MARKUP THAT MATTERS

Hidde de Vries, Modern Frontends Live, London, 18 November 2022

HI, I'M HIDDE

developer relations +
accessibility specialist

sanity.io
hidde.blog
@hdv

SANITY.IO

platform for structured content / deeply customisable CMS / content as data

TRY IT OUT

Free boosted plan for all
Modern Frontends Live!
attendees

`sanity.io/modernfrontendslive`

@hdv

LET'S TALK ACCESSBILITY

WEB ACCESSIBILITY

to ensure people with disabilities
can use your site/app

WEB ACCESSIBILITY

to ensure people with disabilities
can buy your product

WEB ACCESSIBILITY

to ensure people with disabilities
can use your service

1-2%

blind/visually impaired

`

4%

colour blind

OOGVERENIGING (1 IN 12 MEN, 1 IN 250 WOMEN)

neurological conditions

THIS CONCERNS A LOT OF PEOPLE

motor impairments

9%

deaf/heard of hearing

HOORWIJZER

15%

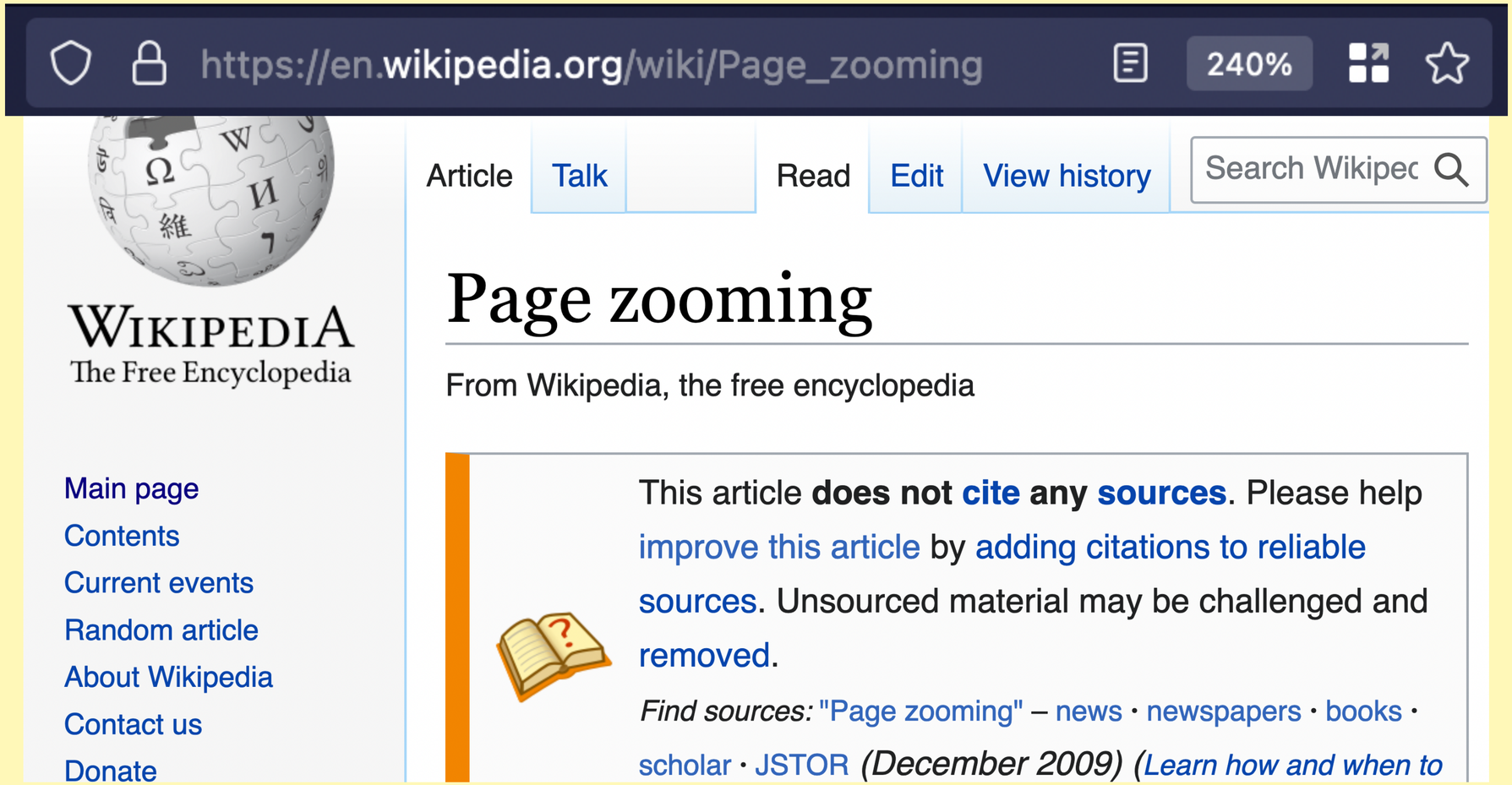
low numerate / low literate

ALGEMENE REKENKAMER

A LOT OF PEOPLE

Use high contrast modes

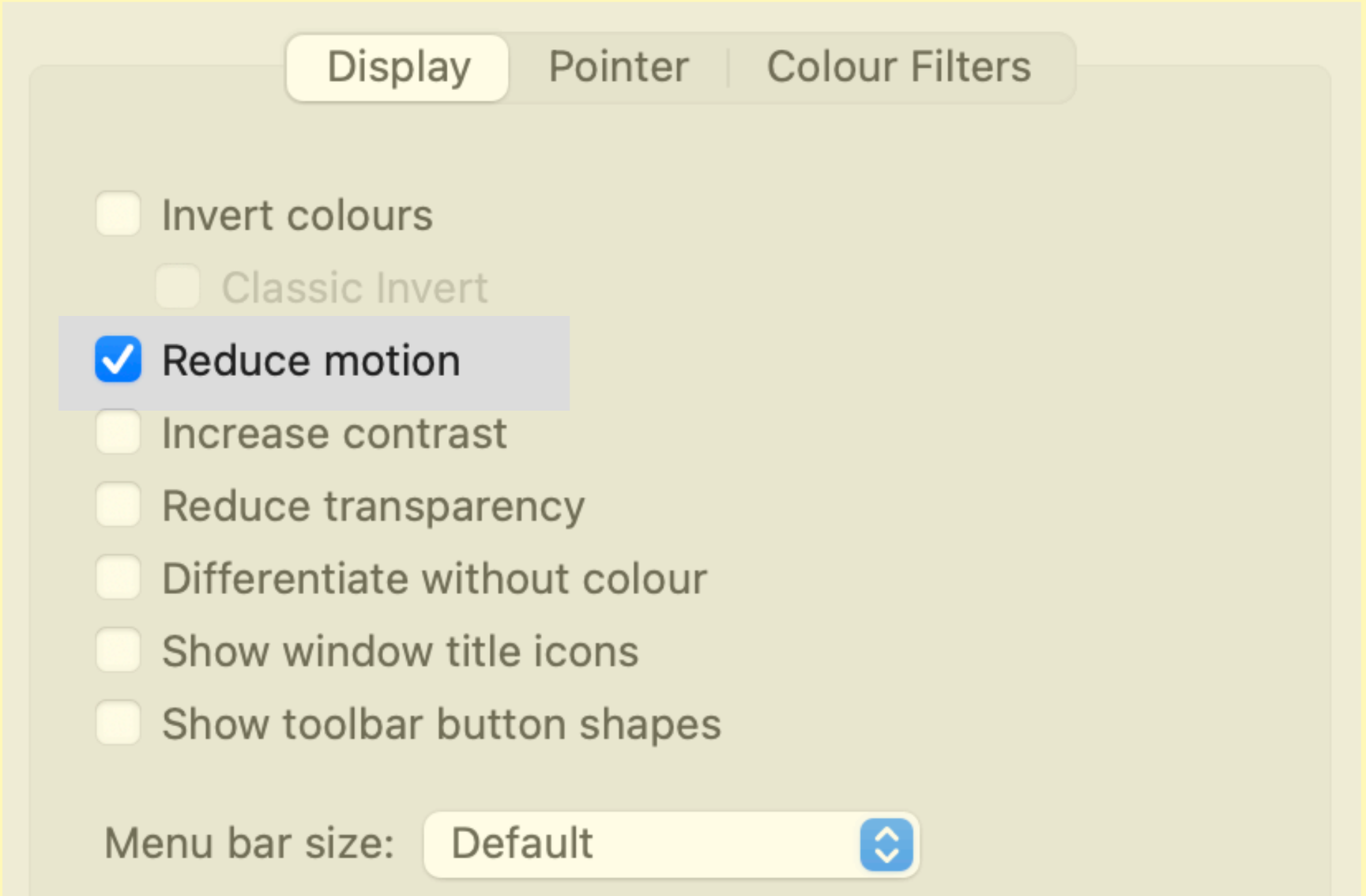
A LOT OF PEOPLE



Zoom in on web pages

A LOT OF PEOPLE

Prefer reduced motion



A LOT OF PEOPLE

Do not use a mouse

A LOT OF PEOPLE

- zoom in web pages
- use high contrast modes
- use assistive technologies
- need audio/video transcribed
- do not use a mouse
- use voice recognition
- prefer reduced motion

W3C/WAI, *How People with Disabilities Use the Web* https://www.w3.org/WAI/people-use-web/tools-techniques

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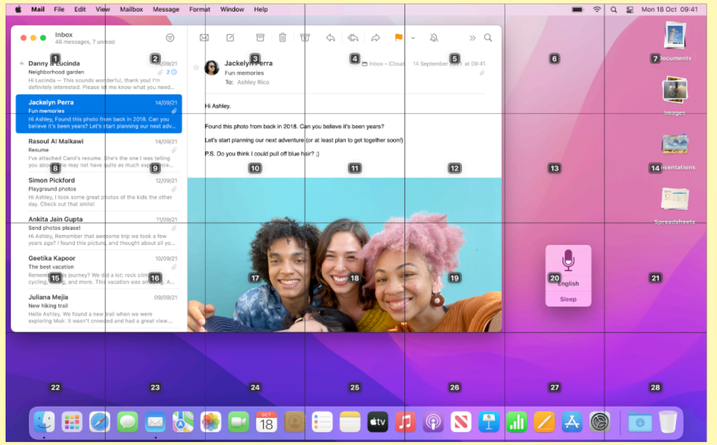


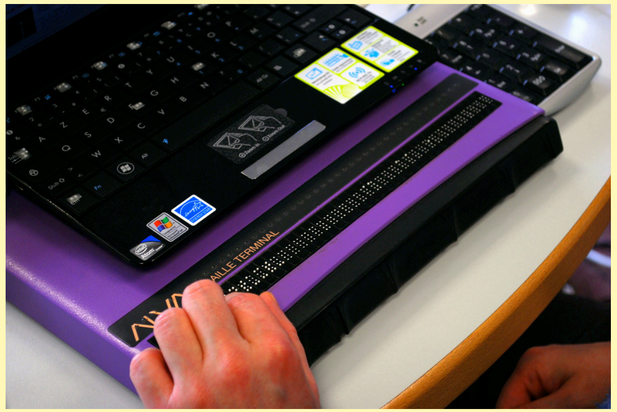


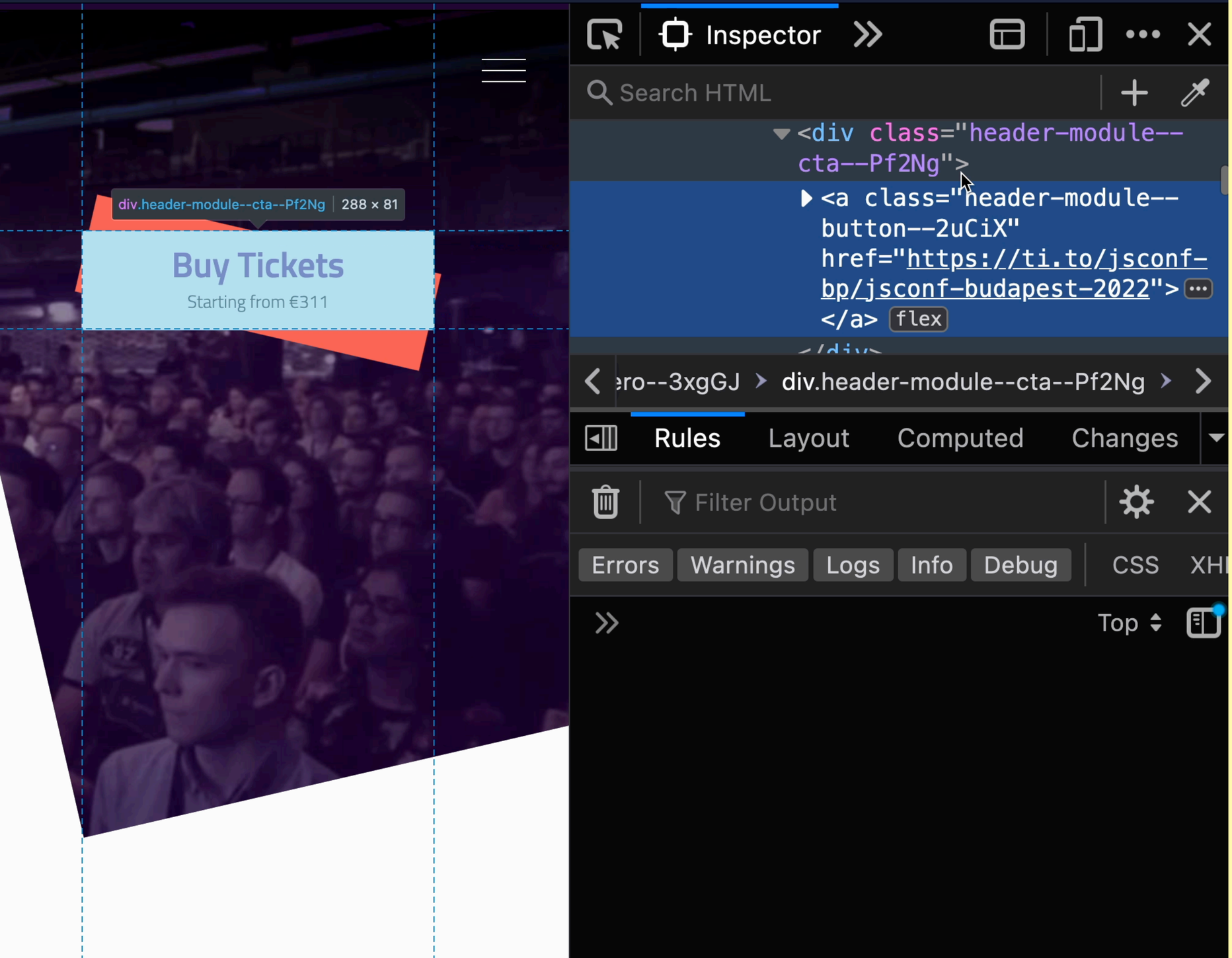
Image credits: Apple, Wikipedia

WHAT OUR MARKUP DOES

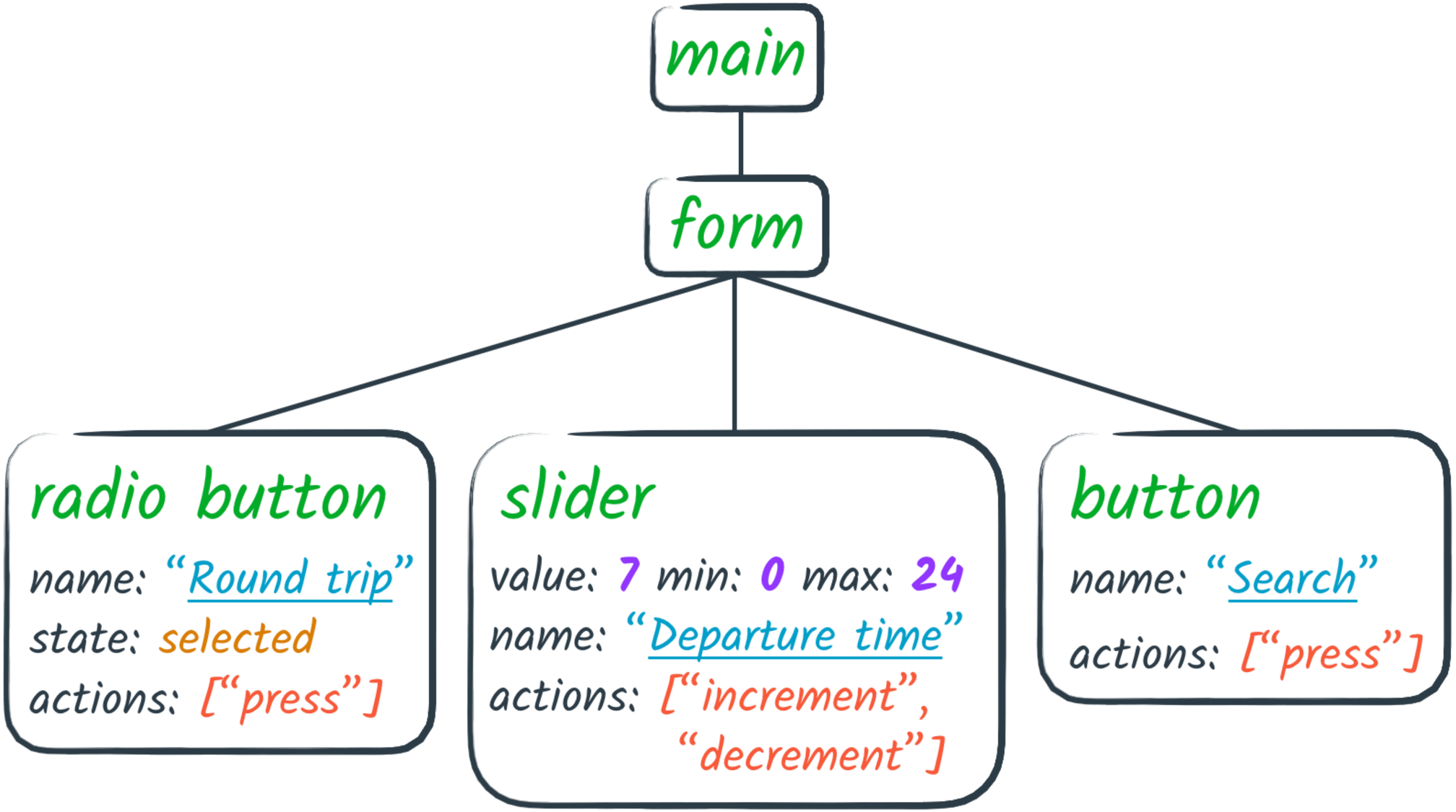
Photo: brianna.lehman on Flickr

Photo: Stephen Fulljames on Flickr

Accessible code provides semantics: it points machines at *what stuff is*



DOCUMENT OBJECT MODEL



Example of an Accessibility Tree • https://github.com/WICG/aom/blob/gh-pages/images/a11y-node.png

ACCESSIBILITY TREE

What kind of thing is it?

How should we refer to it?

What else should we know?

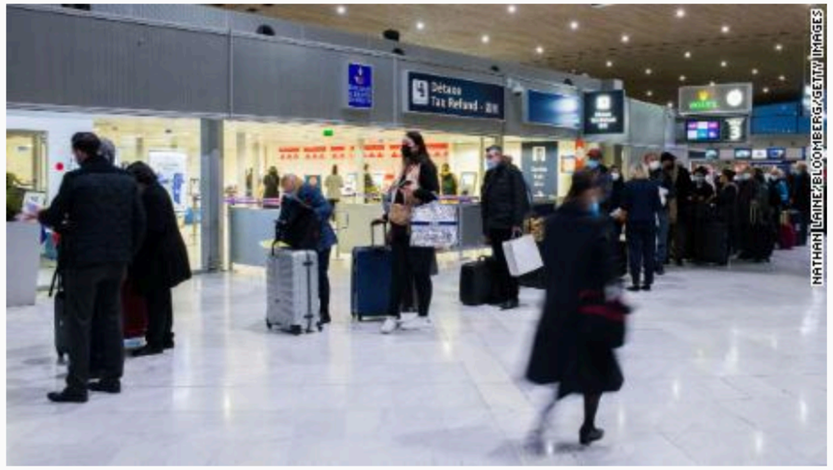
CNN International - Breaking Ne

https://edition.cnn.com

CNN World US Politics Business Health Entertainment Style Travel Sports Videos Edition

NEW PODCAST: Tug of war | **COVID-19:** Vaccination tracker | **TRENDING:** Astroworld tragedy | Tuvalu minister | Obama speech | US reopens | George Harrison

US is reopening its borders to global epicenter of Covid-19



The country ends a 20-month travel ban at the same moment Europe is battling a surge in cases

Global Covid-19 cases surpass 250 million

What the end of the Covid-19 pandemic could look like

Ted Cruz accuses Big Bird of spreading propaganda

Obama takes swipe at Trump over 'active hostility' on climate

- See an ethical farm with 6,000 chickens
- Fossil fuel lobbyists outnumber any single country at COP26
- Minister stands in suit and tie in sea to speak

Concertgoer sues Travis Scott

CIA Director had rare conversation with Putin

Sierra Leone tanker blast deaths rise to 115

US seizes $6 million in ransom payments

Analysis: Biden basks after huge victory

Analysis: Nancy Pelosi is the most effective speaker ever

Gay footballer says he would be 'scared' to play at 2022 World Cup in Qatar

Bodies of three missing French climbers recovered in Himalayas

Ethiopia appears to be detaining people 'based on ethnicity,' commission warns

Crime scene technician testifies in trial of men charged with killing Ahmaud Arbery

French cop survives stabbing attack

Czech parliament won't have any Communist party members for first time in 76 years

Video shows aftermath of assassination

CNN International - Breaking Ne

https://edition.cnn.com

CNN World US Politics Business Health Entertainment Style Travel Sports Videos Edition

role: link

name: “World”

NEW PODCAST: Tug of war | COVID-19: agedy | Tuvalu minister | Obama speech | US reopens | George Harrison

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https://edition.cnn.com

World | US Politics | Business | Health | Entertainment | Style | Travel | Sports | Videos | Edition

NEW PODCAST: Tug of wa… Vaccinati… …uvalu minister | Obama speech | US reopens | George Harrison

US is reopening borders to globa… epicenter of Covi…

role: link

name: “US politics”

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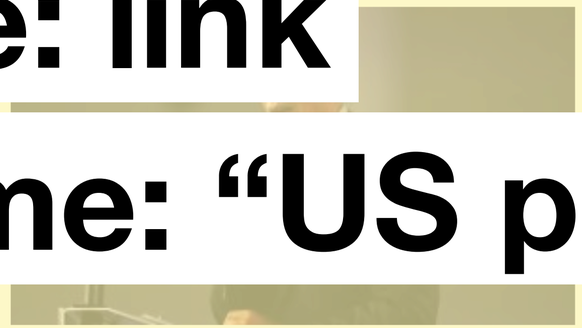

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CNN | World | US Politics | Business | Health | Entertainment | Style | Travel | Sports | Videos | Edition

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role: link

name: “Business”

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role: button

name: “Edition”

YOUR MARKUP

DOM TREE

Accessibility tree

Platform APIs

Microsoft

Microsoft Active Accessibility
Microsoft User Interface Automation
MSAA

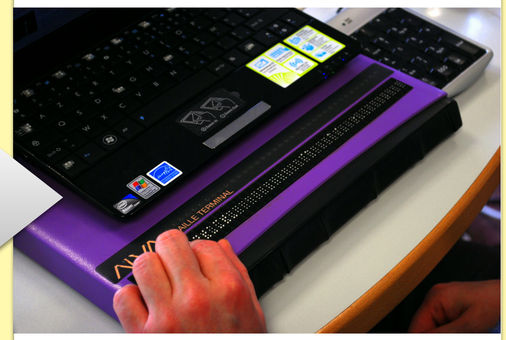
Mac OS X Accessibility Protocol

THE LINUX FOUNDATION
GNOME DEVELOPER

Linux/Unix Accessibility Toolkit
IAccessible2

AT

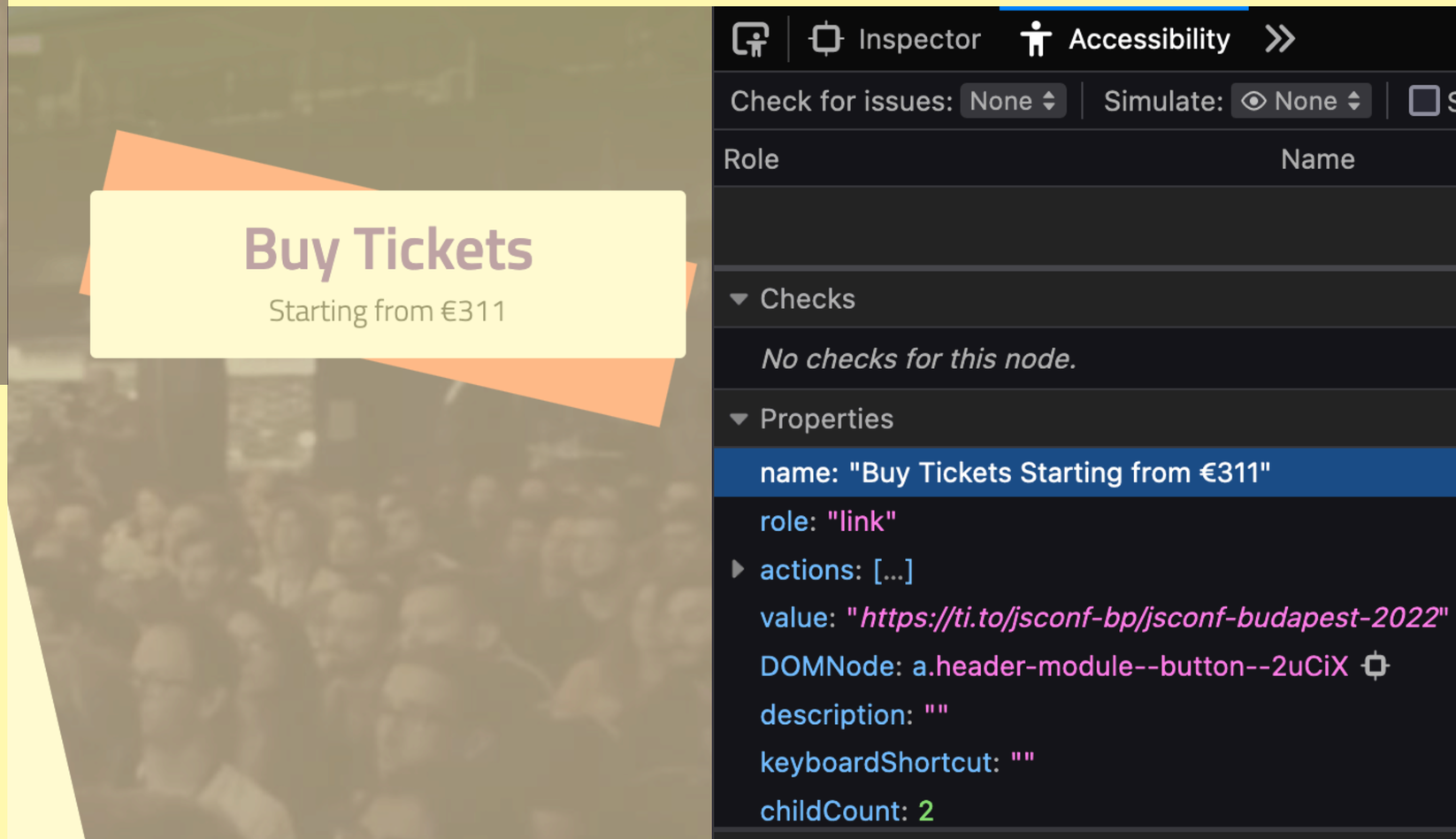
JAWS for Windows



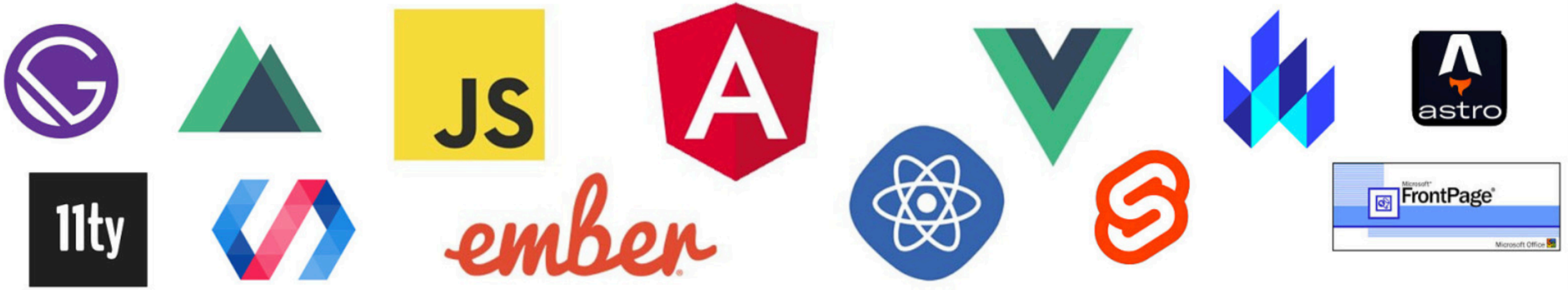
text-to-speech
screen magnifiers
alternate pointing devices

< Chromium

Firefox ∨



IT'S THE MARKUP THAT MATTERS, IN PRACTICE



(The following examples work with all of your favourite tools)

Where am I?

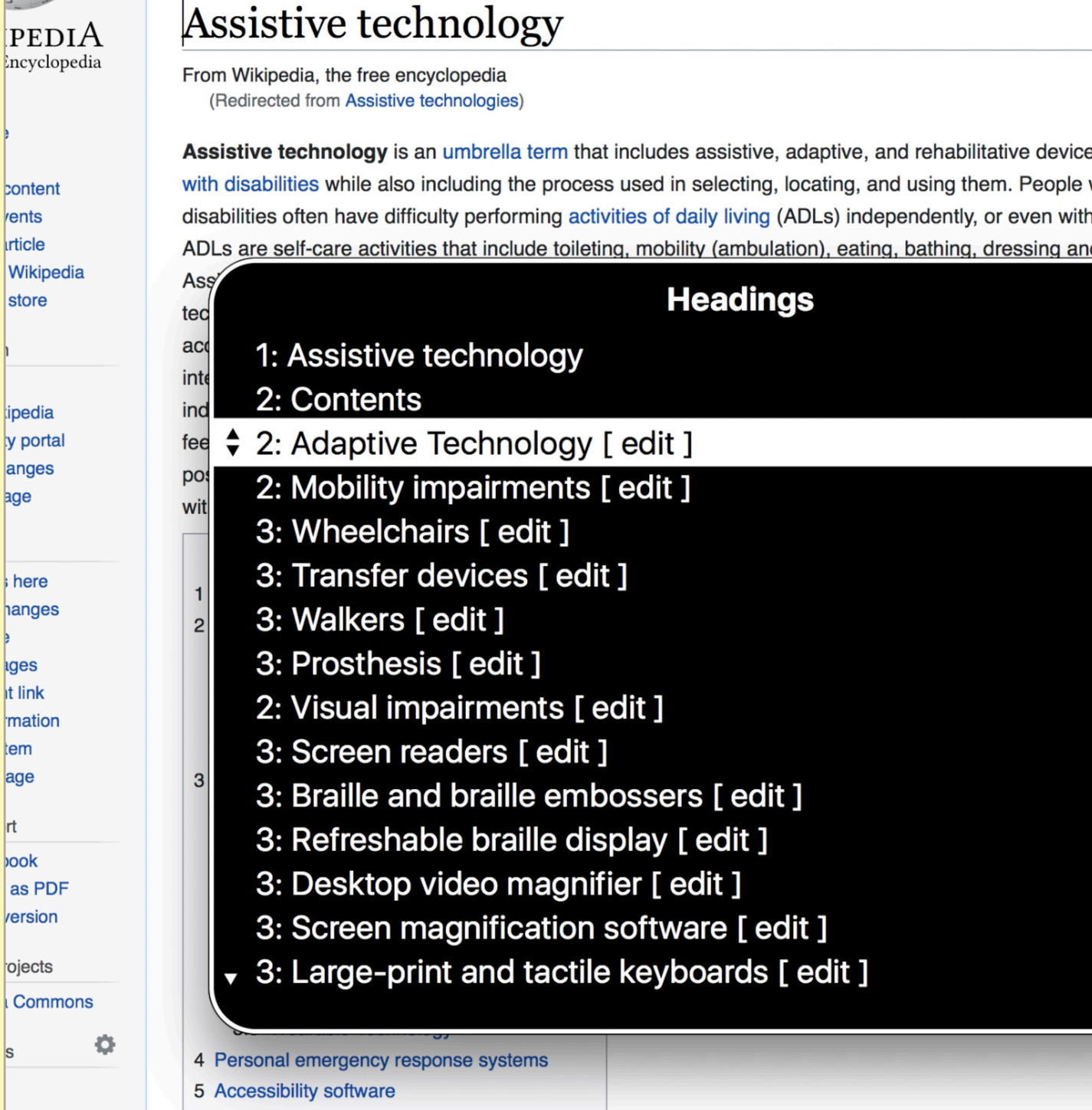
```
<html lang="en">
  <head>
    <title>It's the markup that matters -
      Presentations - My site</title>
  </head>
  <body>
    …
  </body>
</html>
```

> [The <title>] is still the first guarantee or first confirmation that you've ended up on the page that you intended to reach.
>
> — Léonie Watson, accessibility expert and screenreader user

What is on this page?
Headings

Whenever you use <h1>, <h2>, <h3>, … people can:

- navigate by heading
- see headings in reader mode



Every detail counts

Specifications

Which areas are on this page?

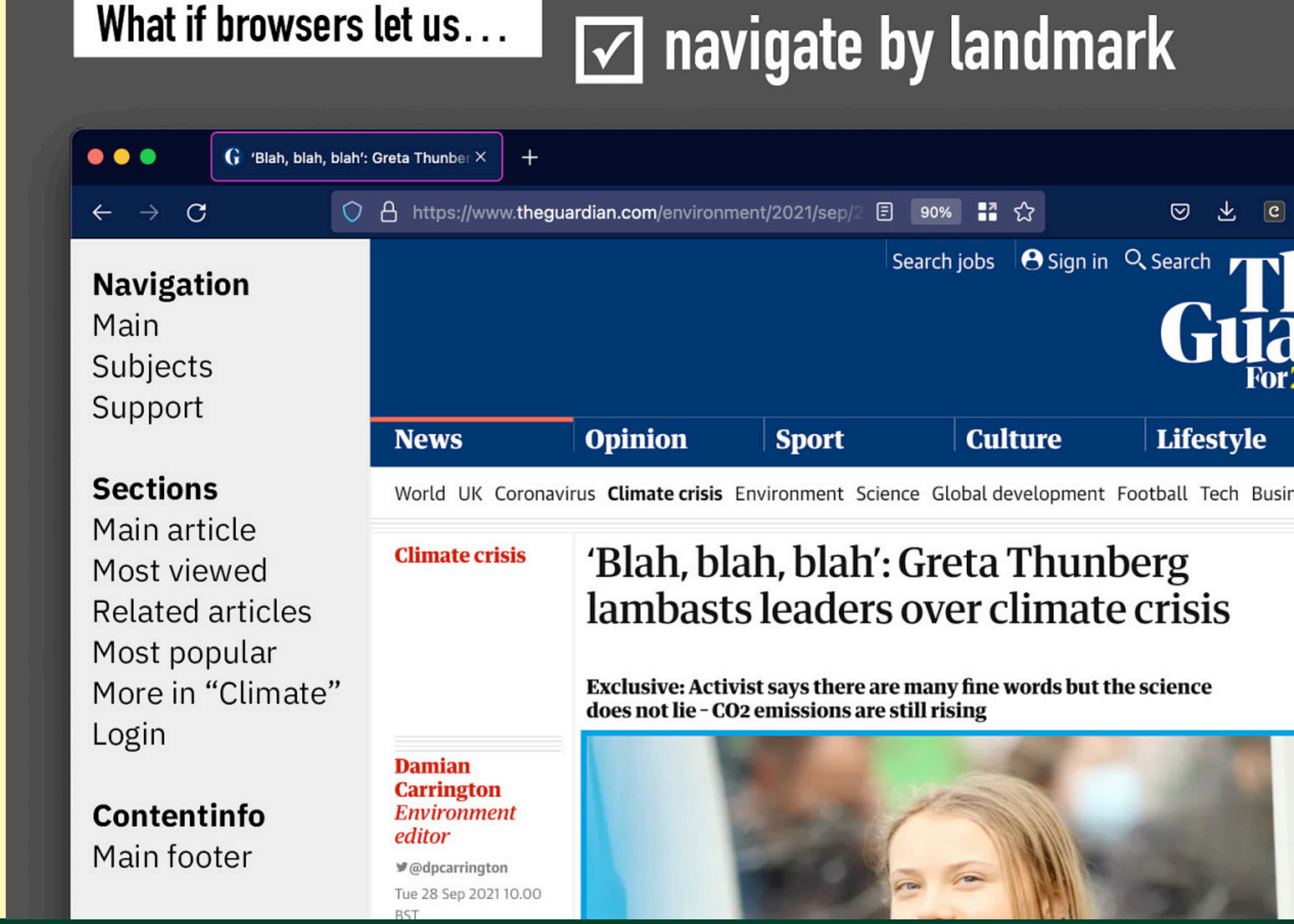
Landmarks let you specify which sections a page has, so that people can navigate to them

HTML5	ARIA ROLES
`<header>`	`role="banner"`
`<footer>`	`role="contentinfo"`
`<nav>`	`role="navigation"`
`<aside>`	`role="complementary"`
`<main>`	`role="main"`

> The more landmarks one has in a document, especially landmarks of the same type, the less meaningful they become
>
> — Scott O’Hara, accessibility specialist

Scott O’Hara: Accessible landmarks · https://www.scottohara.me/blog/2018/03/03/landmarks.html

I would still love this as a browser feature



Form controls

> “46.1% of form inputs were not properly labeled.”
>
> — WebAIM

WebAIM: the WebAIM Million (2022 data) • https://webaim.org/projects/million/

Label input fields, radio buttons, checkboxes, selects, textareas, etc… so that they have a name

City

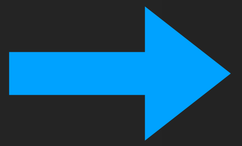
```
<div class="form-item">
  City
  <input type="text" />
</div>
```

Role: 'textbox' / 'entry'
Name: null / ''

Name: ""

aria-labelledby: *Not specified*

aria-label: *Not specified*



From label: *Not specified*

placeholder: *Not specified*

aria-placeholder: *Not specified*

title: *Not specified*

City

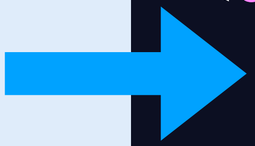
```
<div class="form-item">
  <label for="city">City</label>
  <input id=“city" type="text" />
</div>
```

Role: 'textbox' / 'entry'
Name: ‘City'

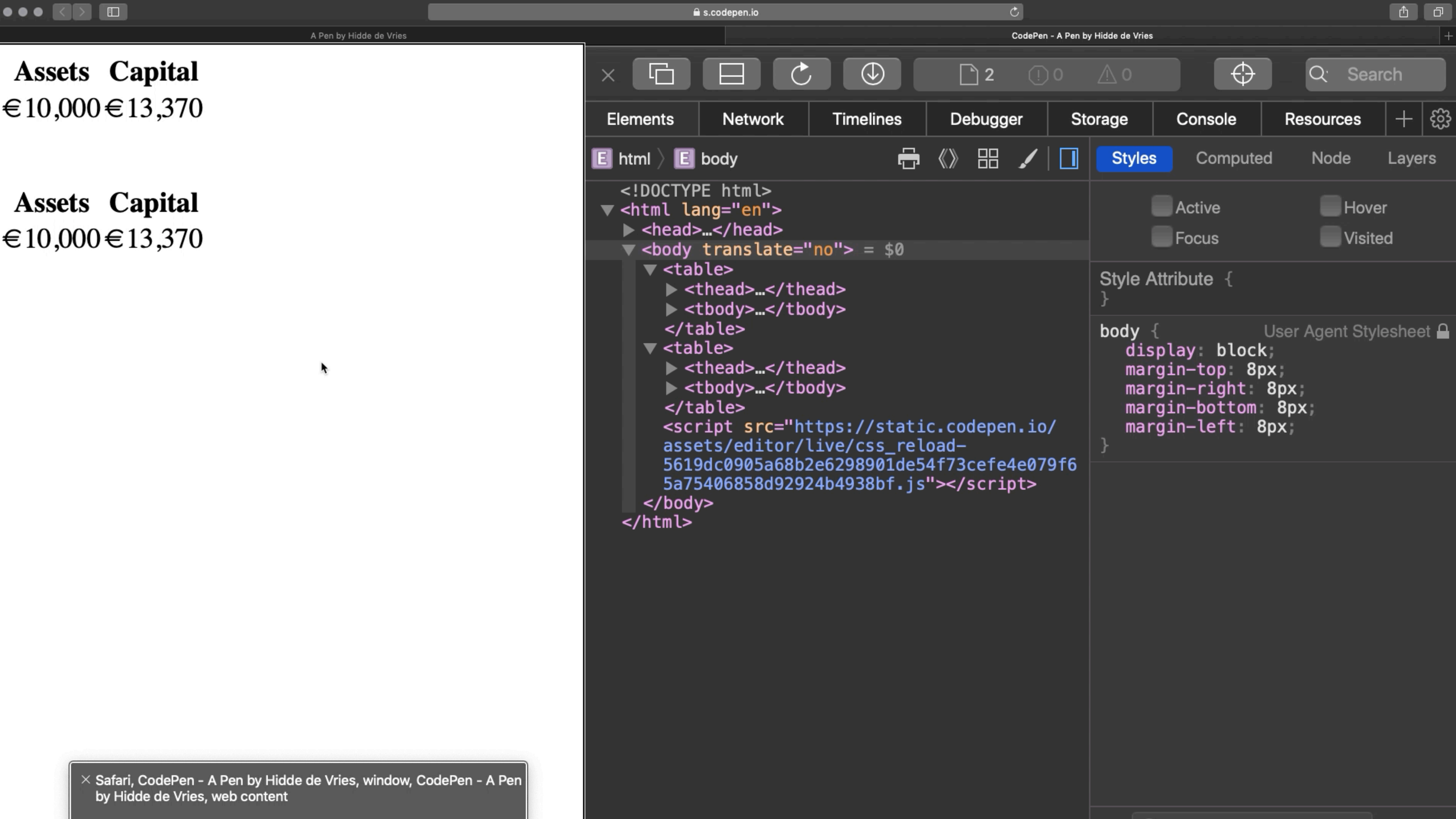
Table semantics

Tables make tabular data easier to navigate

Use table semantics



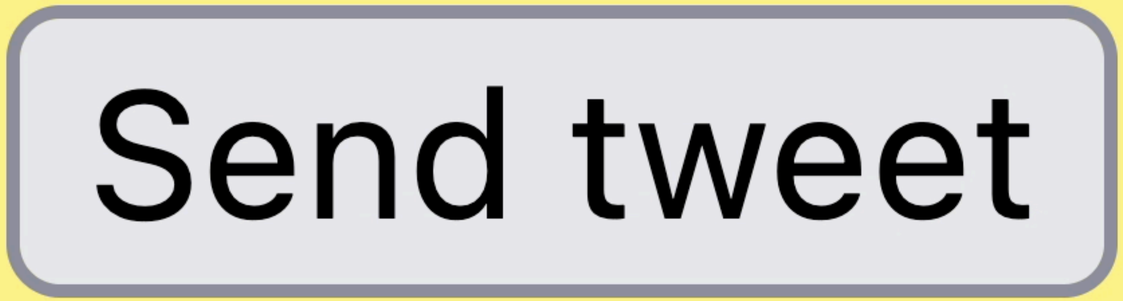
```
<table>
  <caption>Net results 2018</caption>
  <thead>
    <tr>
      <th scope="col">Assets</th>
      <th scope="col">Capital</th>
      …
    </tr>
  </thead>
  <tbody>
      …
  </tbody>
</table>
```


s.codepen.io
A Pen by Hidde de Vries
CodePen - A Pen by Hidde de Vries
Assets Capital
€10,000 €13,370
Assets Capital
€10,000 €13,370
Search
Elements
Network
Timelines
Debugger
Storage
Console
Resources
html
body
Styles
Computed
Node
Layers
Active
Hover
Focus
Visited
Style Attribute {
}
body {
User Agent Stylesheet
display: block;
margin-top: 8px;
margin-right: 8px;
margin-bottom: 8px;
margin-left: 8px;
}
<!DOCTYPE html>
<html lang="en">
<head>…</head>
<body translate="no"> = $0
<table>
<thead>…</thead>
<tbody>…</tbody>
</table>
<table>
<thead>…</thead>
<tbody>…</tbody>
</table>
<script src="https://static.codepen.io/assets/editor/live/css_reload-5619dc0905a68b2e6298901de54f73cefe4e079f65a75406858d92924b4938bf.js"></script>
</body>
</html>
Safari, CodePen - A Pen by Hidde de Vries, window, CodePen - A Pen by Hidde de Vries, web content

Buttons

Whenever you use <button> people can:

- find it in TAB order
- press it with just a keyboard
- submit the form, even if JS fails



The “Add Reaction” button

```
// use the button element
<button type="button">
  <svg class="icon">
    <use xlink:href="#emoji"></use>
  </svg>
</button>
```

Role: 'button'
Name: ''

```
<button type="button"
  aria-label="Add reaction">
  <svg class="icon">
    <use xlink:href="#emoji"></use>
  </svg>
</button>
```

Role: 'button'
Name: 'Add reaction'

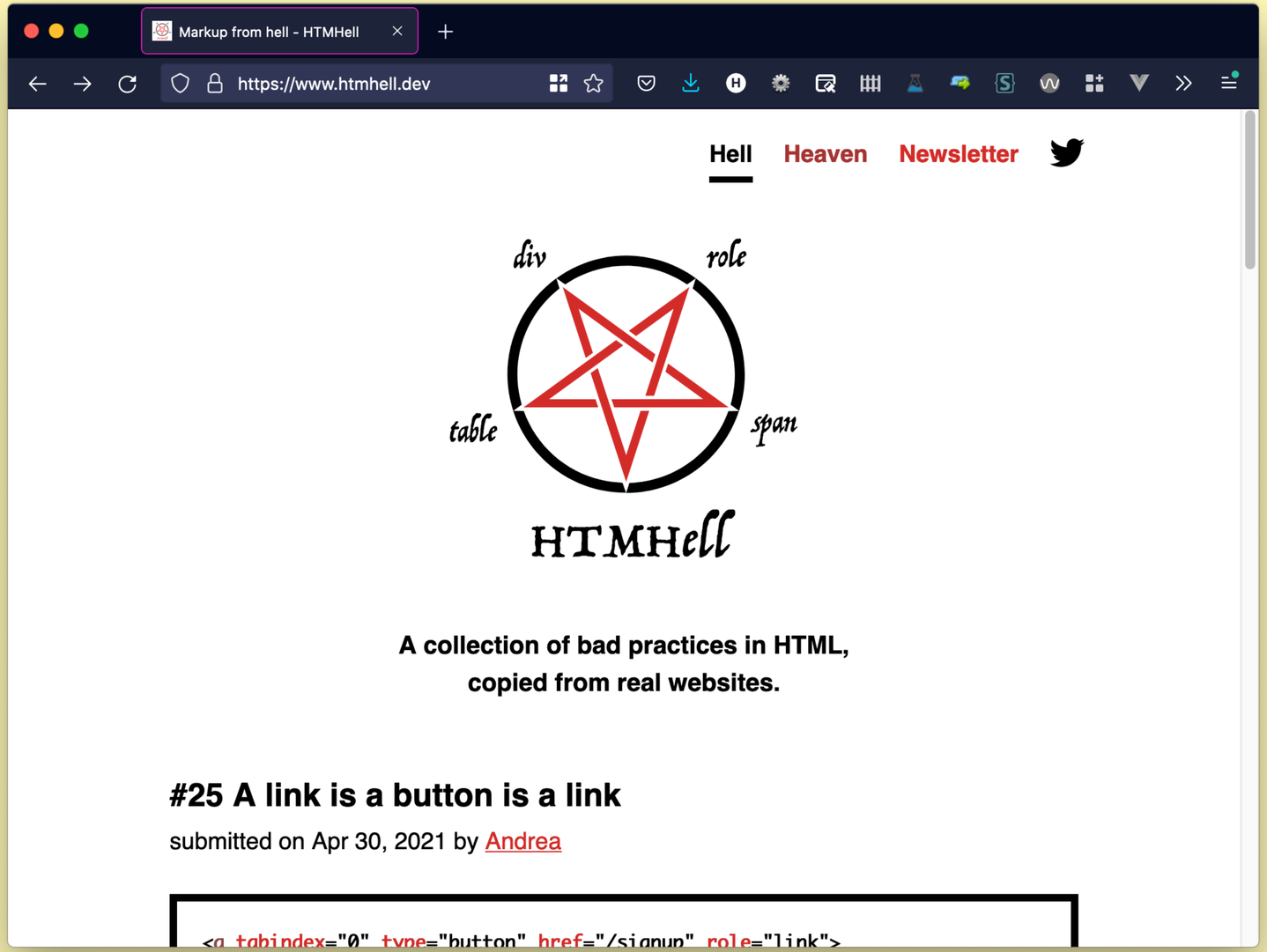
```
<button type="button">
  <svg class="icon">
    <use xlink:href="#emoji"></use>
  </svg>
  // add accessible name
  <span class="visually-hidden">
   Add reaction
  </span>
</button>
```

Role: 'button'
Name: 'Add reaction'

The HTML spec
is the place to find
out how to use HTML

developers.whatwg.org

HTMHell collects examples of how **not** to use HTML



ACCESSIBILITY OBJECT MODEL

“develop additions to the web platform to allow developers to **provide information** to assistive technology APIs, and to understand what **information browsers provide** to those APIs”

— The AOM explainer document

Setting A11y info with IDL properties

(user-visible, user -modifiable)

```
const el = document.querySelector("el");

el.role = "button";
el.ariaDisabled = false;
```

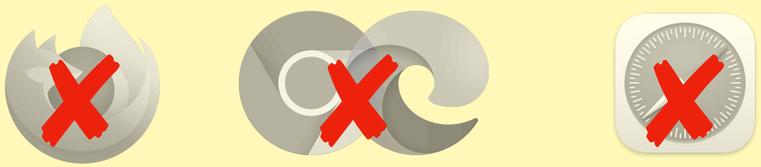
Setting A11y info with IDL properties internally

(not user-visible,
not user-modifiable;
avoids sprouting)

```
const el = document.querySelector("el");

el._internals.role = "button";
el._internals.ariaDisabled = false;
```

RELATIONSHIPS WITHOUT IDREFS

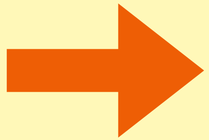


IDREFs don't work across Shadow boundaries

> “an API to forward ARIA attributes and properties set on a Web Component to elements inside of its shadowroot”
>
> — Cross-root ARIA Delegation API explainer

EVENTS FROM ASSISTIVE TECHNOLOGIES

EVENTS FROM ASSISTIVE TECHNOLOGIES



SYNTHESISED DOM EVENTS

READING ACCESSIBILITY TREE FROM JAVASCRIPT

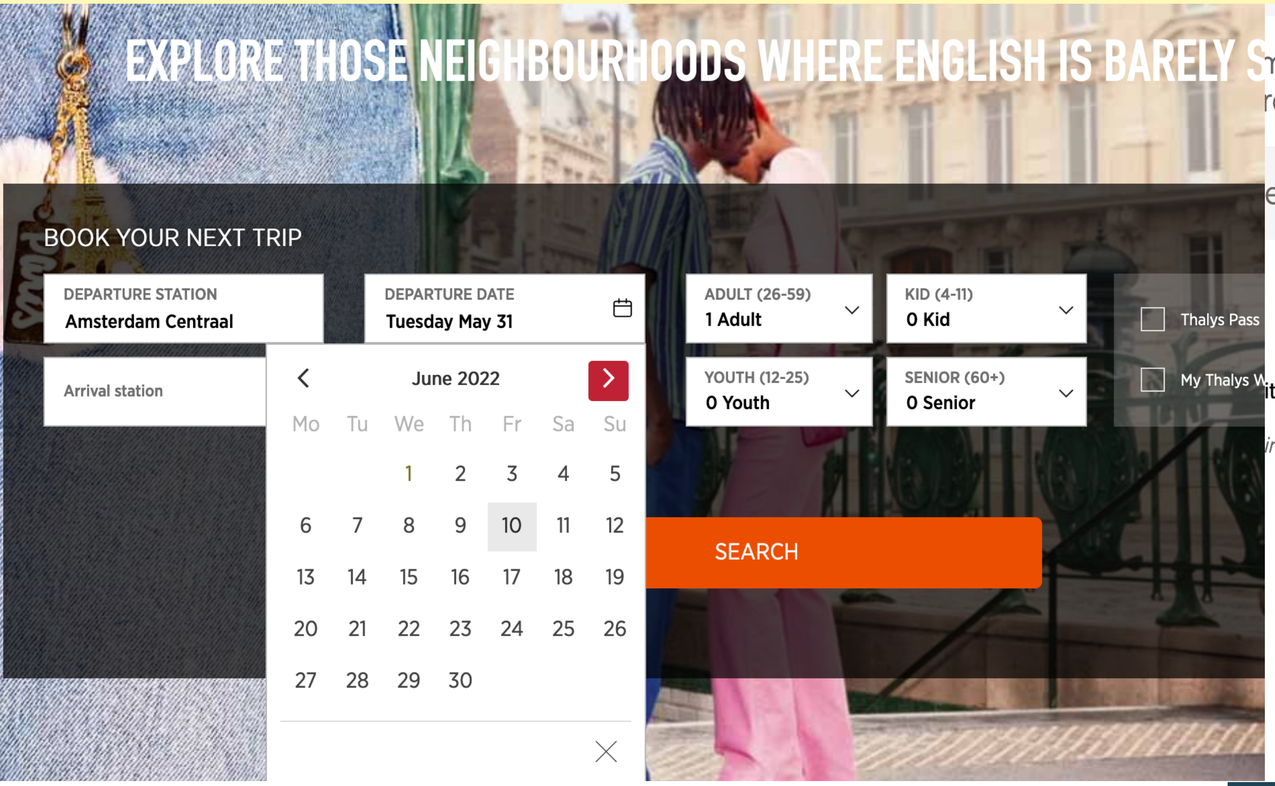
(w/ outdated syntax)

FUTURE ELEMENTS

THE POWER OF THE WEB PLATFORM

HTML comes with accessibility built in

BUT THERE ISN'T HTML FOR EVERYTHING!



met de nachttrein (NJ, reizen?

Amstetten NÖ Bahnhof

St.Anton am Arlberg Bahnhof

evonden

Start van de reis

Datum: DI, 31. MAI 2022

Amstetten NÖ Bahnhof - St.Anton am Arlberg Bahnhof

Voertuigtra

itingen

indingen voor de geselecteerde dag. De volgende verbindingen zijn:

vanaf € 49,90 Sparschiene	vanaf € 74,90 Sparschiene	vanaf € 99,00
vanaf € 59,00	vanaf € 69,90 Sparschiene	Helaas niet beschikbaa
vanaf € 54,90 Sparschiene	vanaf € 69,90 Sparschiene	Helaas niet beschikbaar

Kaartje boeken

Mai 2022

MO DI MI DO FR SA SO

25 26 27 28 29 30 1
2 3 4 5 6 7 8
9 10 11 12 13 14 15
16 17 18 19 20 21 22
23 24 25 26 27 28 29
30 31 1 2 3 4 5

HEUTE

Where to?

City, state, location, or airport

31 MAY TUE

1 JUN WED

1 Room, 1 Guest

Special Rates

Book a beach t

May 2022

SUN MON TUE WED THU FRI SAT
1 2 3 4 5 6 7
8 9 10 11 12 13 14
15 16 17 18 19 20 21
22 23 24 25 26 27 28
29 30 31

June 2022

SUN MON TUE WED THU FRI SAT
1 2 3 4
5 6 7 8 9 10 11
12 13 14 15 16 17 18
19 20 21 22 23 24 25
26 27 28 29 30

My Dates are Flexible

Close

Bestemming *

Stad, luchthaven, attractie of adres

Inchecken

31-05-2022

Uitchecken

01-06-2022

Kamers en gasten

1 kamer, 1 gast

* Affiliatie met de respectievelijke organisatie benoc

** In een zoekopdracht naar het Beste beschikbare

Var

mei 2022

maa din woe don vri zat zon
1
2 3 4 5 6 7 8
9 10 11 12 13 14 15
16 17 18 19 20 21 22
23 24 25 26 27 28 29
30 31

juni 2022

maa din woe don vri zat zon
1 2 3 4 5
6 7 8 9 10 11 12
13 14 15 16 17 18 19
20 21 22 23 24 25 26
27 28 29 30

> “We hope to make it unnecessary to reinvent built-in UI controls”
>
> — OpenUI homepage

Standardised controls can be a huge opportunity for accessibility

Nicole Sullivan
@stubbornella

Replying to @sarah_edo @film_girl and 3 others

A goal of APIs like toggle, selectmenu, and popup is design systems and component libs can use them to make components interactive and they'll handle a11y for common use cases. I'm calling it "implied accessibility semantics". It's hard to get right, but if we do

Standardised controls can be a huge opportunity for accessibility

(if accessibility considerations are met)

EXPERIMENTAL

@hdv

<selectmenu>

DEVELOPERS ON <SELECT>

Hard to build “search in list” UI

– 27.43% of respondents

Can’t customise popup window (desktop)

– 11.36% of respondents

Can’t style <option>

– 17.85% of respondents

Need to insert arbitrary HTML

– 7.82% of respondents

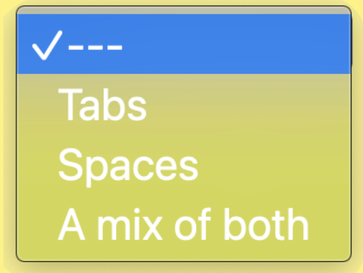
Can’t style default state

– 14.01% of respondents

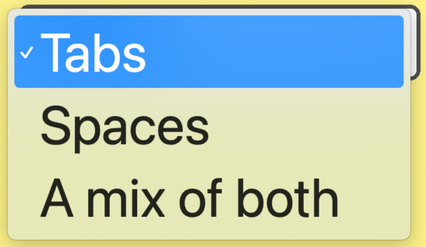
Greg Whitworth, Can we please style the <select> control?! • https://www.gwhitworth.com/posts/2019/can-we-please-style-select/

```
// regular select
<select>
  <option>Tabs</option>
  <option>Spaces</option>
  <option>A mix of both</option>
</select>
```

Firefox

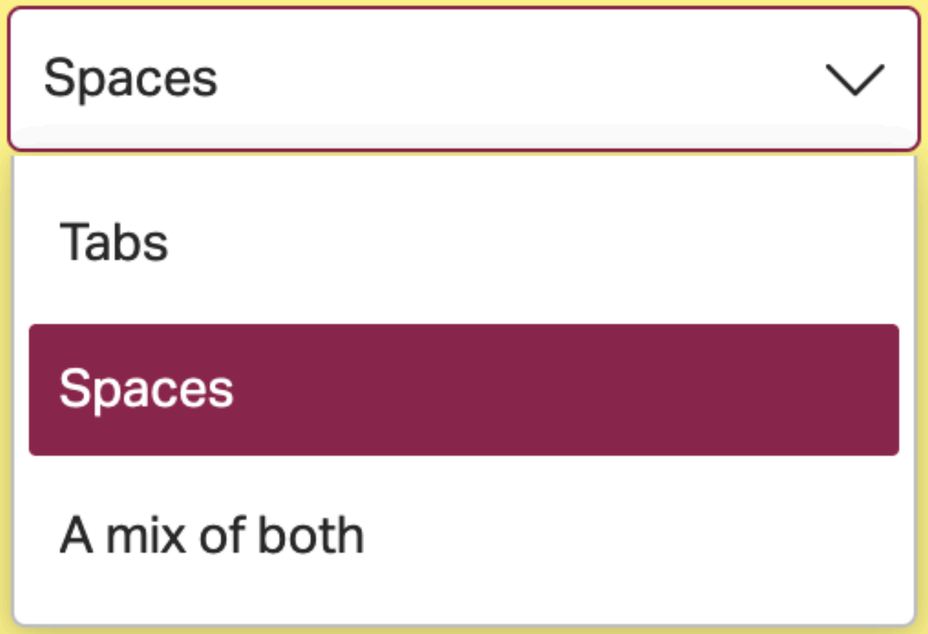


Edge



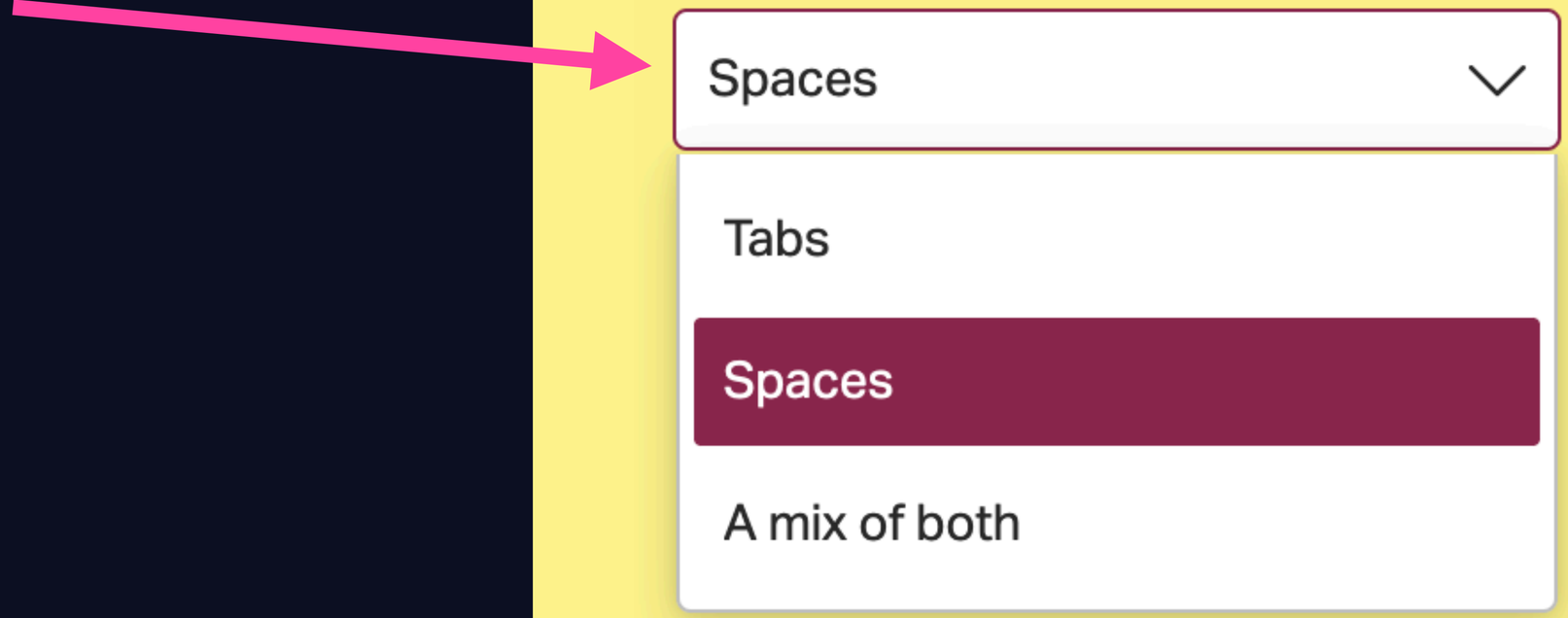
```
// introducing… <selectmenu>
<selectmenu>
  <option>Tabs</option>
  <option>Spaces</option>
  <option>A mix of both</option>
</select>
```

EXPERIMENTAL



Example from FAST UI · https://explore.fast.design/components/fast-select

```
selectmenu::part(button) {
  background-color: #f00;
  border-radius: 5px;
}
```

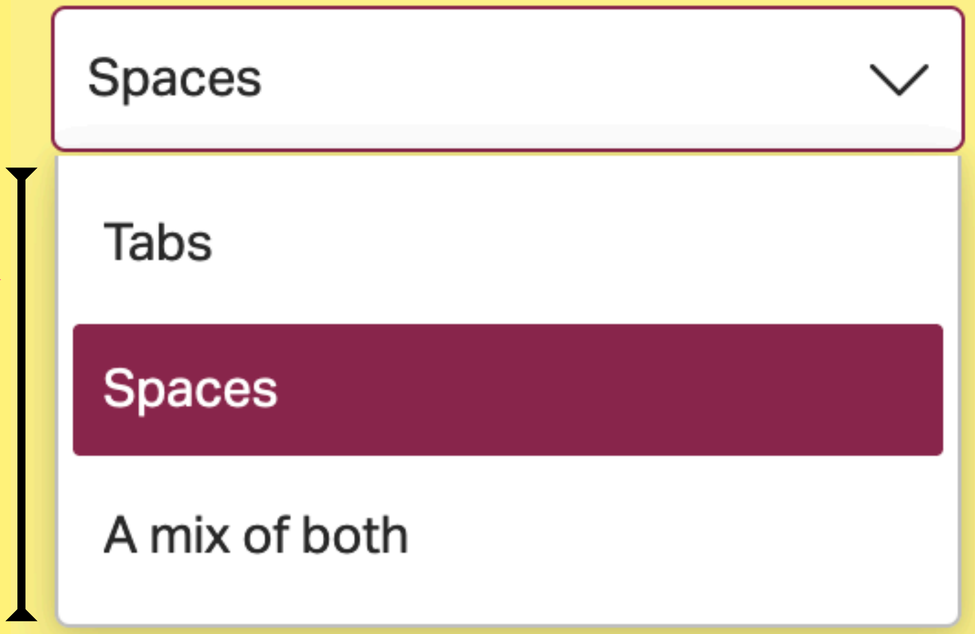


Example from FAST UI · https://explore.fast.design/components/fast-select

```css
selectmenu::part(button) {
  background-color: #f00;
  border-radius: 5px;
}

selectmenu::part(listbox) {
  padding: 10px;
  margin-top: 5px;
}
```

EXPERIMENTAL



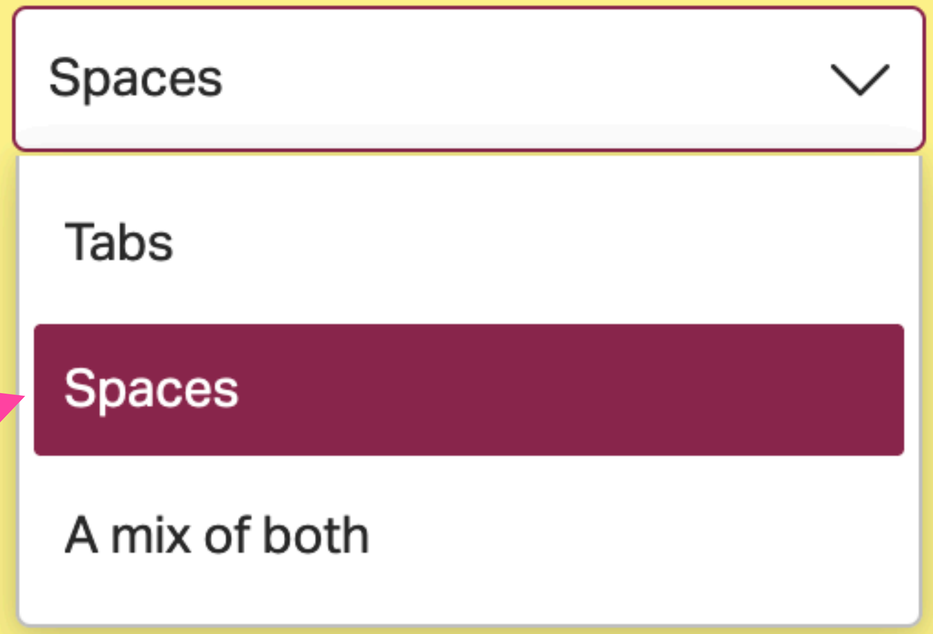
Example from FAST UI · https://explore.fast.design/components/fast-select

```css
selectmenu::part(button) {
  background-color: #f00;
  border-radius: 5px;
}

selectmenu::part(listbox) {
  padding: 10px;
  margin-top: 5px;
}

selectmenu::part(selected-value) {
  padding: 10px;
  margin-top: 5px;
}
```

EXPERIMENTAL



Example from FAST UI · https://explore.fast.design/components/fast-select

EXPERIMENTAL

<SELECTMENU> BROWSER SUPPORT

Experimental, behind flags, known accessibility issues

about:flags, “Experimental Web Features”

@hdv

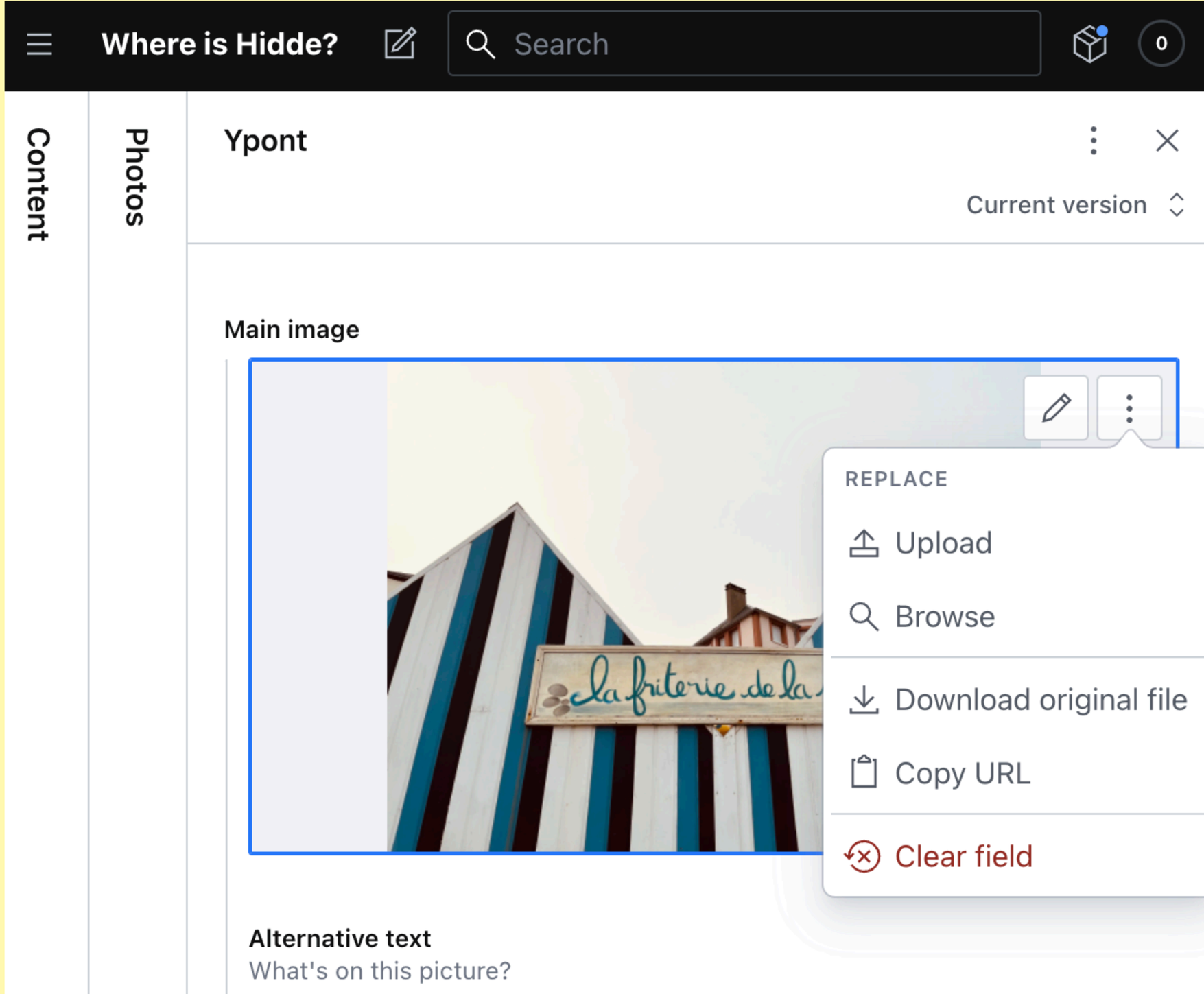
EXPERIMENTAL

@hdv

`popover` attribute

(formerly known as “popup”)

popover would be an attribute for HTML to make popup-like behaviors easier to build



POPOVER EXAMPLES

action menus

teaching UI

content pickers

form element suggestions

`<select>`'s listbox

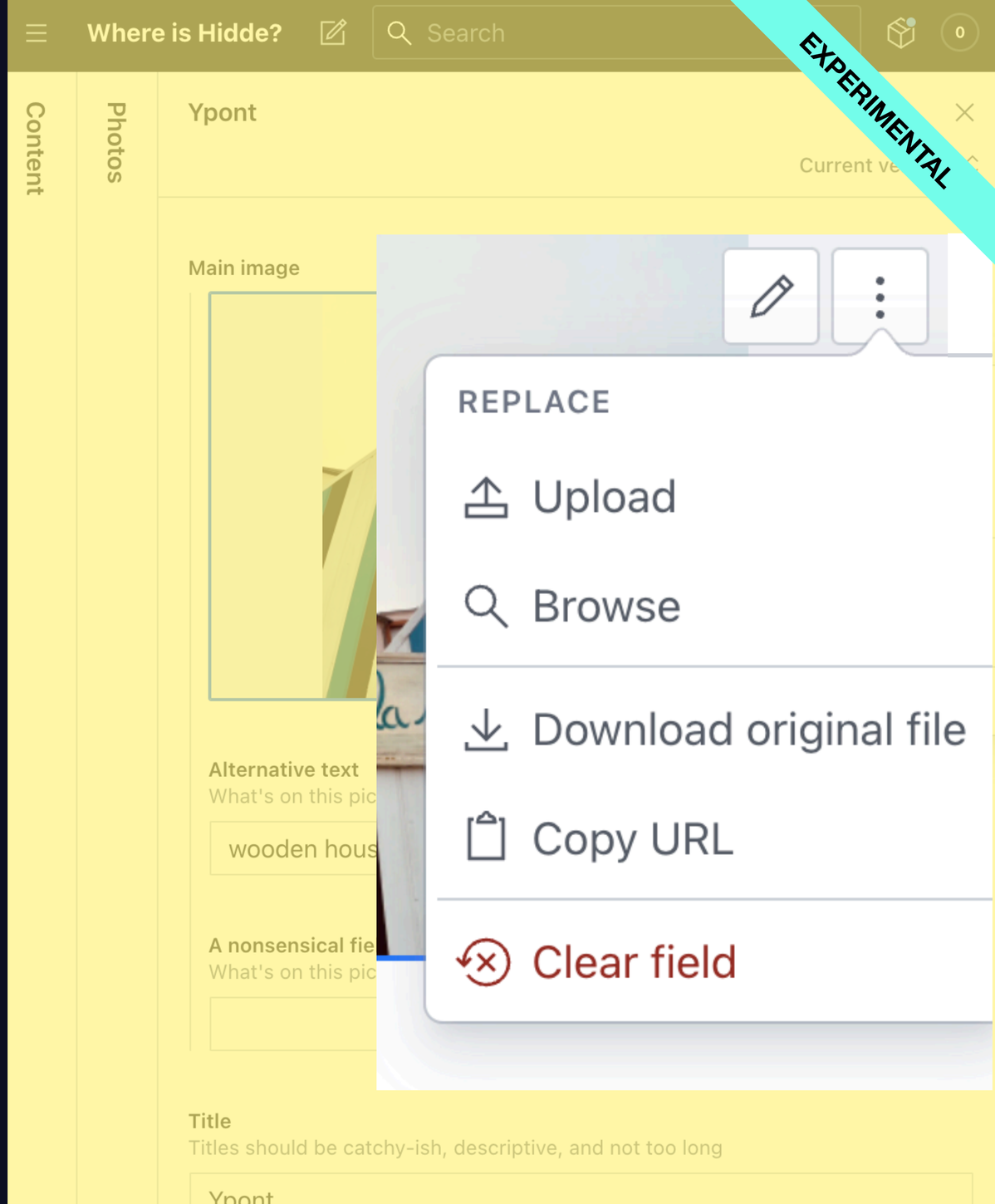
COMMON POPOVER BEHAVIOURS

on top of other page content

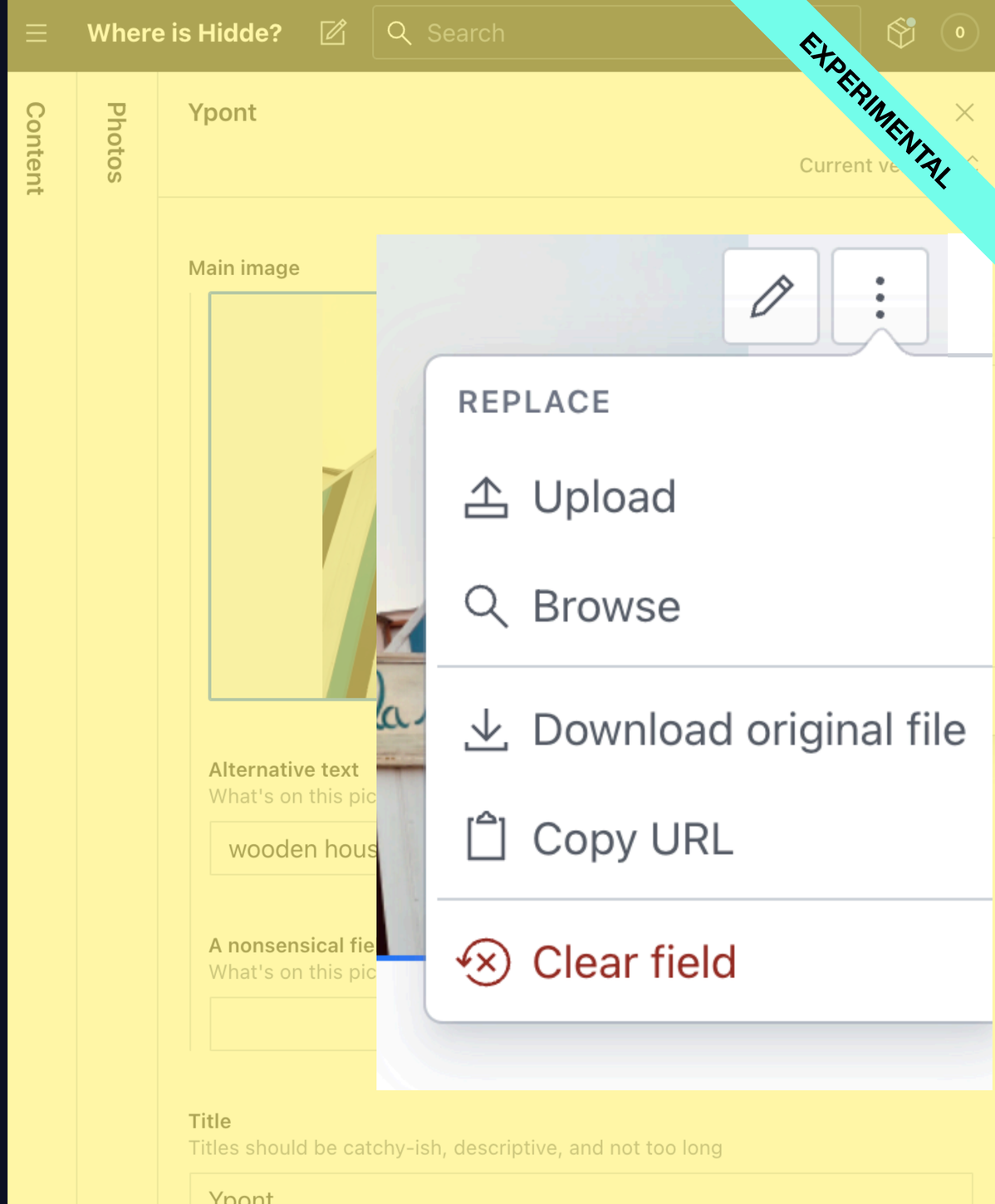
only open when it needs to be

usually one at the time

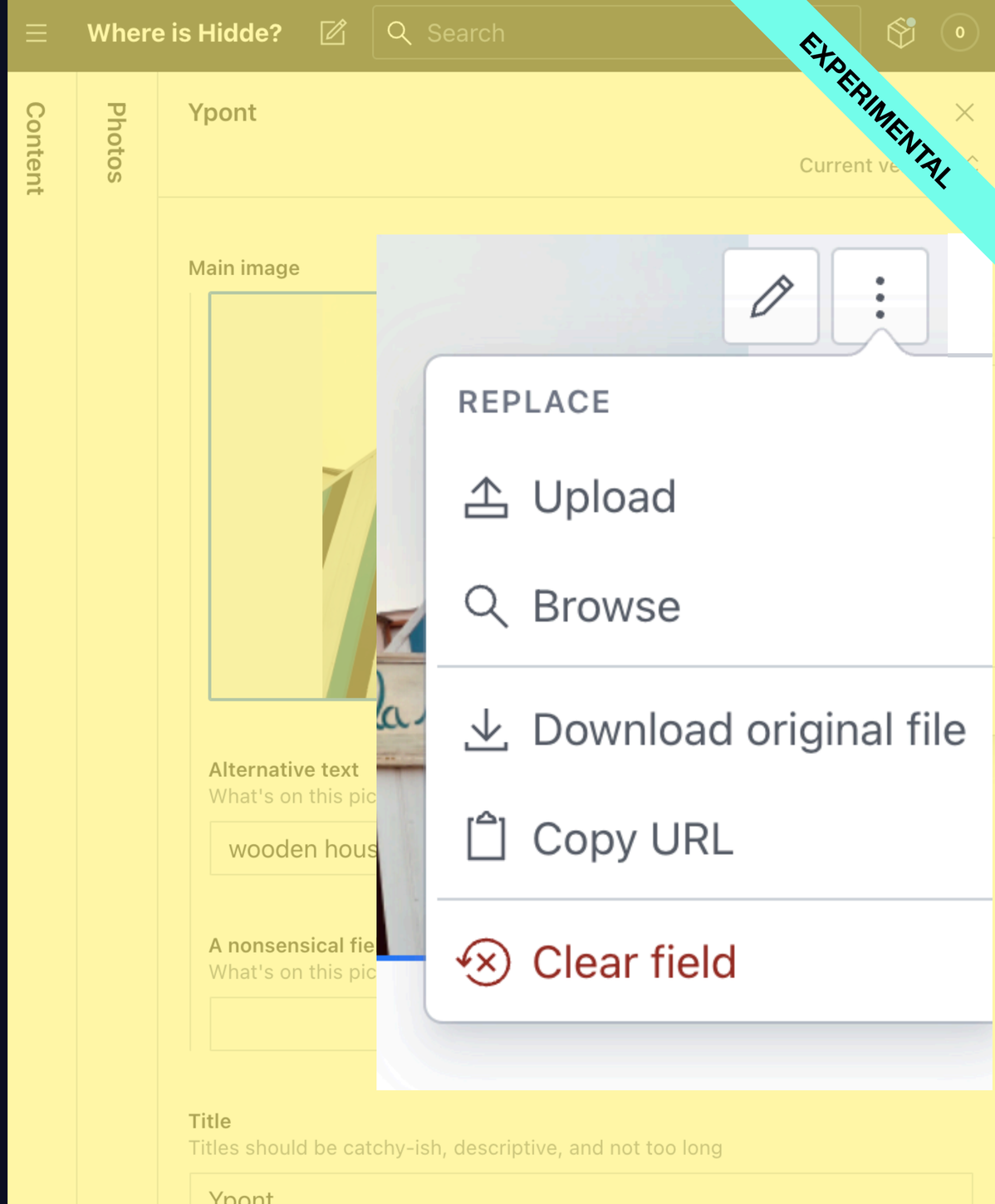
```
// create a popover
<div>
  <h3>Replace image</h3>
  <button>Upload</button>
  <button>Browse</button>
  …
</div>
```



```
// give this popup behavior
<div popover>
  <h3>Replace image</h3>
  <button>Upload</button>
  <button>Browse</button>
  …
</div>
```

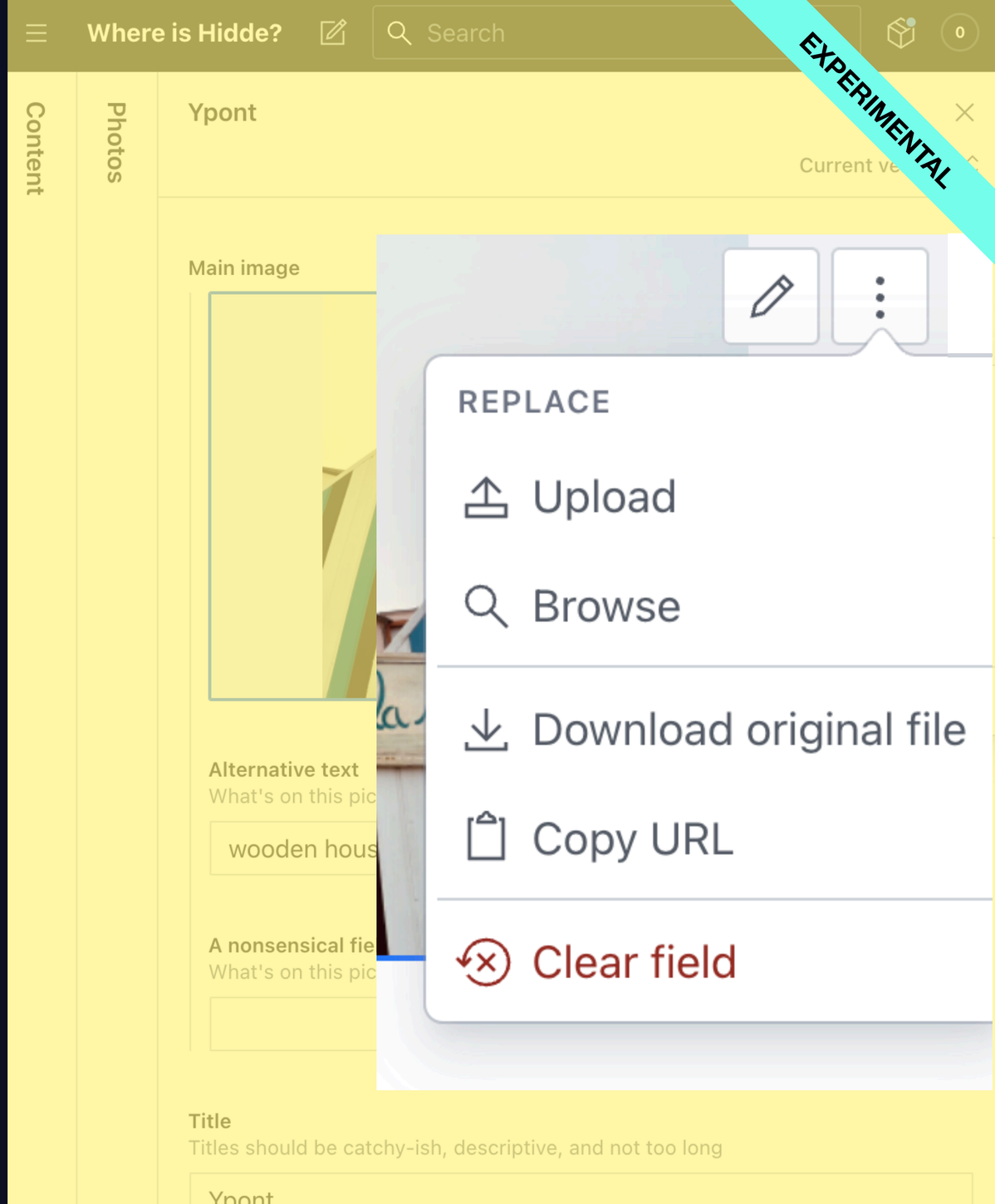


```
// add a unique ID
<div popover id="options">
  <h3>Replace image</h3>
  <button>Upload</button>
  <button>Browse</button>
  …
</div>
```



```
// add a toggle button
<button togglepopover="options">
  Image options
</button>

// give this popup behavior
<div popover id="options">
  <h3>Replace image</h3>
  <button>Upload</button>
  <button>Browse</button>
  …
</div>
```



```
// make an async popup
<div popover="async" id="statusMessage">
</div>
```

EXPERIMENTAL

Main image

Alternative text
What's on this picture?

wooden houses painted lightblue, darkblue and white, with a sigr

A nonsensical field for fun
What's on this picture?

ad

Title
Titles should be catchy-ish, descriptive, and not too long

Ypont

The document was published

just now

Published

```
// make an async popup
<div popover="async" id="statusMessage">
</div>

const statusMessage =
  document.querySelector("#options");
```

EXPERIMENTAL

Main image

Alternative text
What's on this picture?

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What's on this picture?

ad

Title
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Ypont

The document was published

just now

Published

```
// make an async popup
<div popover="async" id="statusMessage">
</div>

const statusMessage =
  document.querySelector("#options");

// do publishing magic, then:
statusMessage.textContent =
  "This document was published";
statusMessage.showPopover();
```

EXPERIMENTAL

Main image

Alternative text
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What's on this picture?

ad

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The document was published

just now

Published

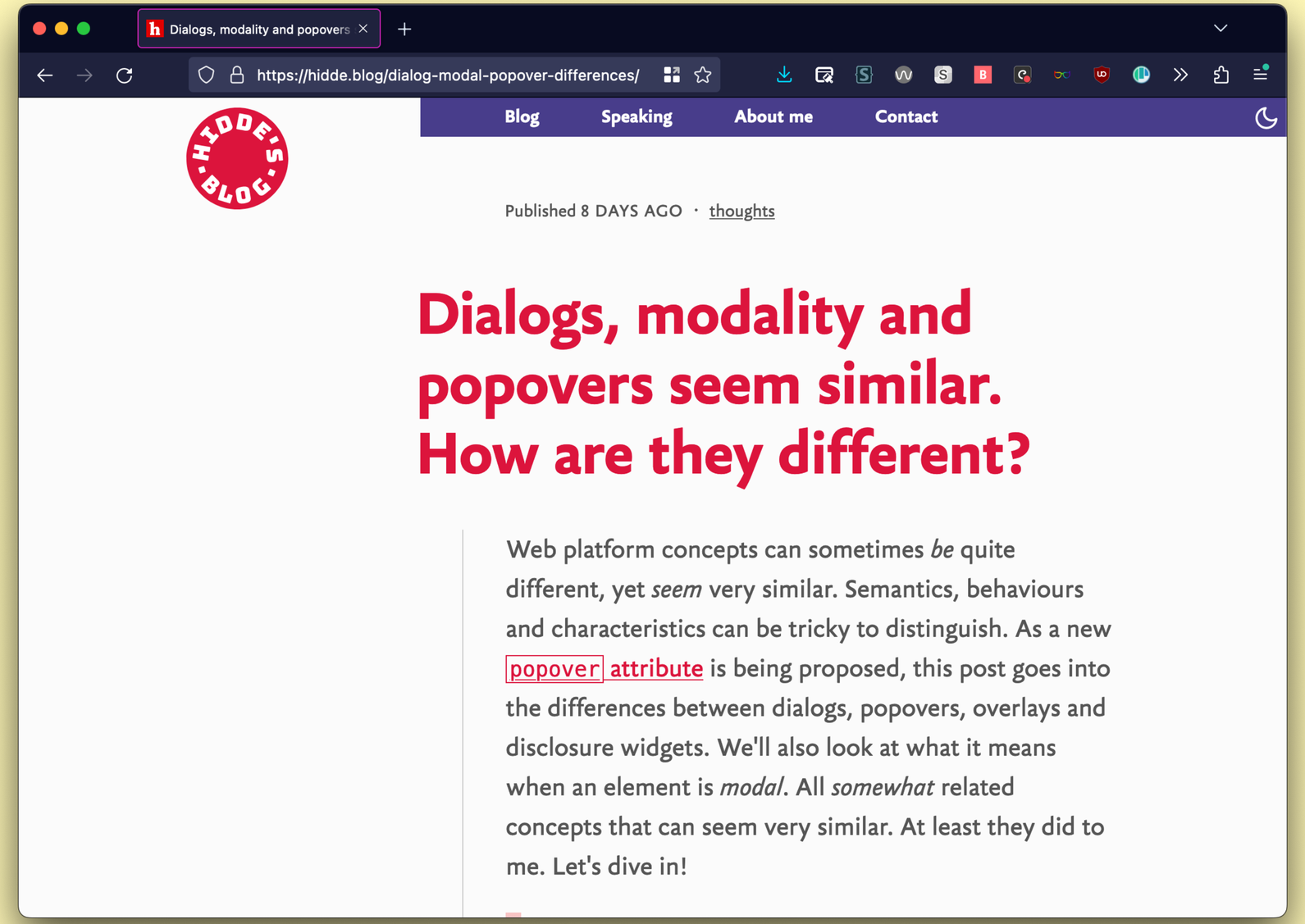
EXPERIMENTAL

popover browser support

Experimental, behind flags,
known accessibility issues

about:flags, “Experimental Web Features”

@hdv



https://hidde.blog/dialog-modal-popover-differences/

We want your thoughts!

@OpenUICG on Twitter

Discord / weekly meetings

WRAPPING UP

MARKUP AFFECTS ACCESSIBILITY TREES

MARKUP AFFECTS ACCESSIBILITY TREES

SOME OF THIS IS COMING TO JAVASCRIPT LAND

MARKUP AFFECTS ACCESSIBILITY TREES

SOME OF THIS IS COMING TO JAVASCRIPT LAND

SOME OF THIS MAY BE BUILT INTO NEW HTML ELEMENTS

THANKS FOR LISTENING!

Contact/resources

talks.hiddedevries.nl
@hdv@front-end.social or hidde@sanity.io

Special thanks for clarifications, input, feedback
Mason Freed, Scott O'Hara, Julia Silver, Eric Eggert,
all at Open UI CG

Typefaces
Bungee by David Jonathan Ross (DJR)
Rasa by Anna Giedryś, David Březina (Rosetta)