

# CSS ANCHORING

TPAC 2022

JHEY TOMPKINS - GOOGLE

**CONTENT**

**ADVISORY**

**EXPERIMENTAL CONTENT**



- A common pattern
- A tricky pattern
- A headache for developers

 **Jhey** 🐱🔥🌟 @jh3yy · 22h  
What's the thing you dislike most about building tooltips?  
And why is it implementing responsive anchoring with JavaScript?

 **Cu & Código** @lixetto · 22h  
Replying to @jh3yy  
@thevinilis your recent experience with getBoundingClientRect

 **David East** @\_daveeast · 22h  
Replying to @jh3yy  
getting the proper "active" and "dismiss" states correct. I also don't like positioning them relative to the content...  
...I'm starting to realize I don't like tooltips lol

 **Jakub Kotrs** @goues\_cz · 5h  
Replying to @jh3yy  
You cannot use native title attribute as the source of content. If there was a way to stile the title of buttons for example, that would be a game changer.

 **Quentin Morel** @morelipsum · 21h  
Replying to @jh3yy  
PopperJS for this, so usefull, but a little bit overkill sometimes 😊

 **Лия**  
@LiyaGaneyeve  
Replying to @jh3yy  
Adding the tooltip to the scrolling container. Total disaster from the beginning

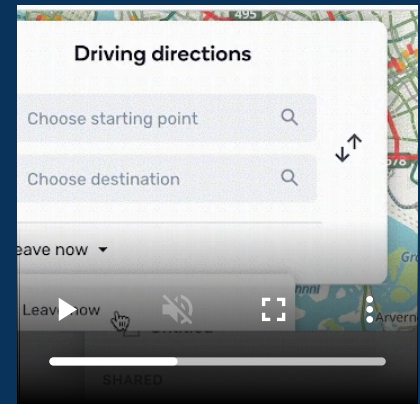
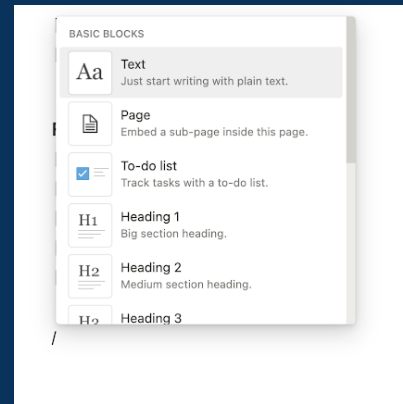
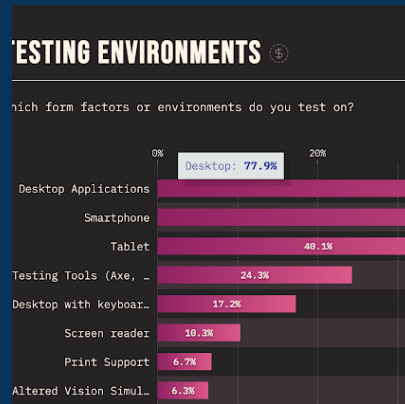
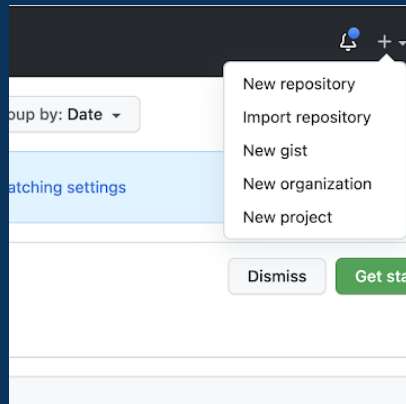
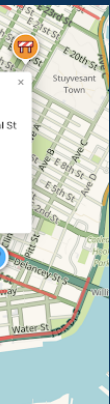
 **krave** @krave8 · 13h  
Replying to @jh3yy  
1. If I build a component with tooltips, I can not ensure it is always stay inside the viewport.  
2. If a user wrap my component inside a div with overflow: hidden, they will complain it is my fault.  
3. When you have multiple tooltips used on one page and they pop up randomly, you have to make sure only one is displayed. That's why I need javascript.

 **David L. Herring** @DavidLHerring · 21h  
Replying to @jh3yy  
Making sure they disappear when the view that spawned them disappears, e.g. on closing a modal.

 **Rijk** @rijkvanzanten · 22h  
Replying to @jh3yy  
~~creating the little arrow nub in css ::after~~  
Responsive anchoring of course!

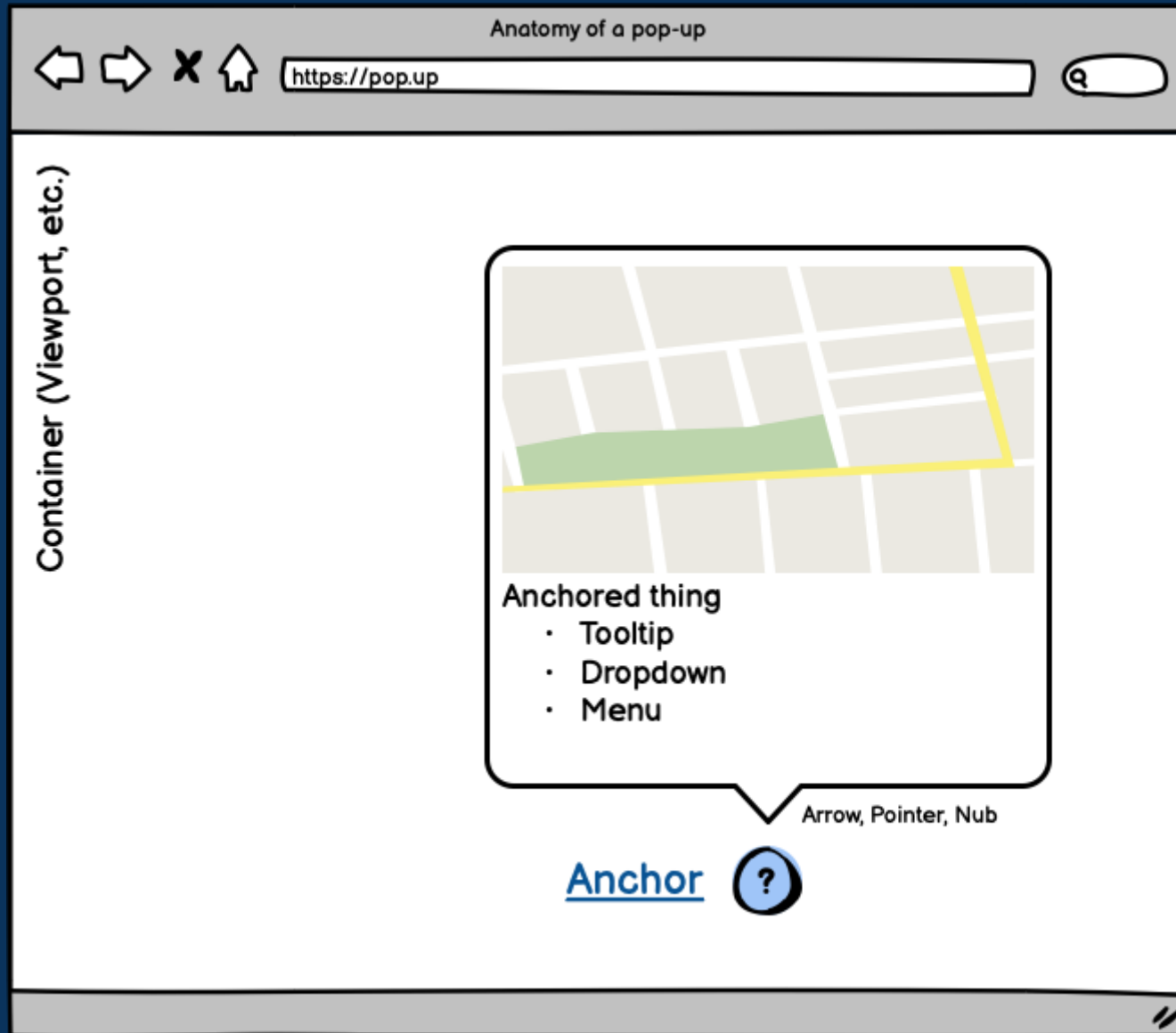
 **Sunkanmi Fafowora** @the\_jonin\_ · 21h  
Replying to @jh3yy  
That there isn't a CSS pseudo-class or pseudo-element for it. 😊  
 **Sunkanmi Fafowora** @the\_jonin\_ · 21h  
Or an html attribute that you can just add and modify with css.

# **ANCHOR POSITIONING AROUND THE WEB**



# NOTICE ALL THE POP-UPS?

A LOT OF THESE USE CASES  
WANT TO GET SOMETHING INTO THE TOP LAYER



**WHAT'S THE SOLUTION?**

# CSS

- Absolute positioning
- Could require a certain DOM structure.  
Mmm wrappers
- Potential for invalid HTML
- Hard to scale/respond to viewport



**Anchor me!**

**The anchor**



**Anchor me!**

**The anchor**

# JAVASCRIPT

- Some boilerplate
- Styles are leaking into script land
- Asks questions
  - When?
  - How?
  - Offsets?

```
<div class="tooltip">Anchor me!</div>
<div class="anchor">The anchor</div>
```

```
.tooltip {
  position: absolute;
  top: calc(var(--y) - 10px);
  left: calc((var(--width) * 0.5) + var(--x));
  transform: translate(-50%, -100%);
}
```

```
const setAnchorPosition = (anchored, anchor) => {
  const bounds = anchor.getBoundingClientRect().toJSON();
  for (const [key, value] of Object.entries(bounds)) {
    anchored.style.setProperty(`--${key}`, value)
  }
}
setAnchorPosition(
  document.querySelector('.tooltip'),
  document.querySelector('.anchor')
)
```

**Anchor me!**

**The anchor**

# THEY ALL LOOKED... THE SAME?

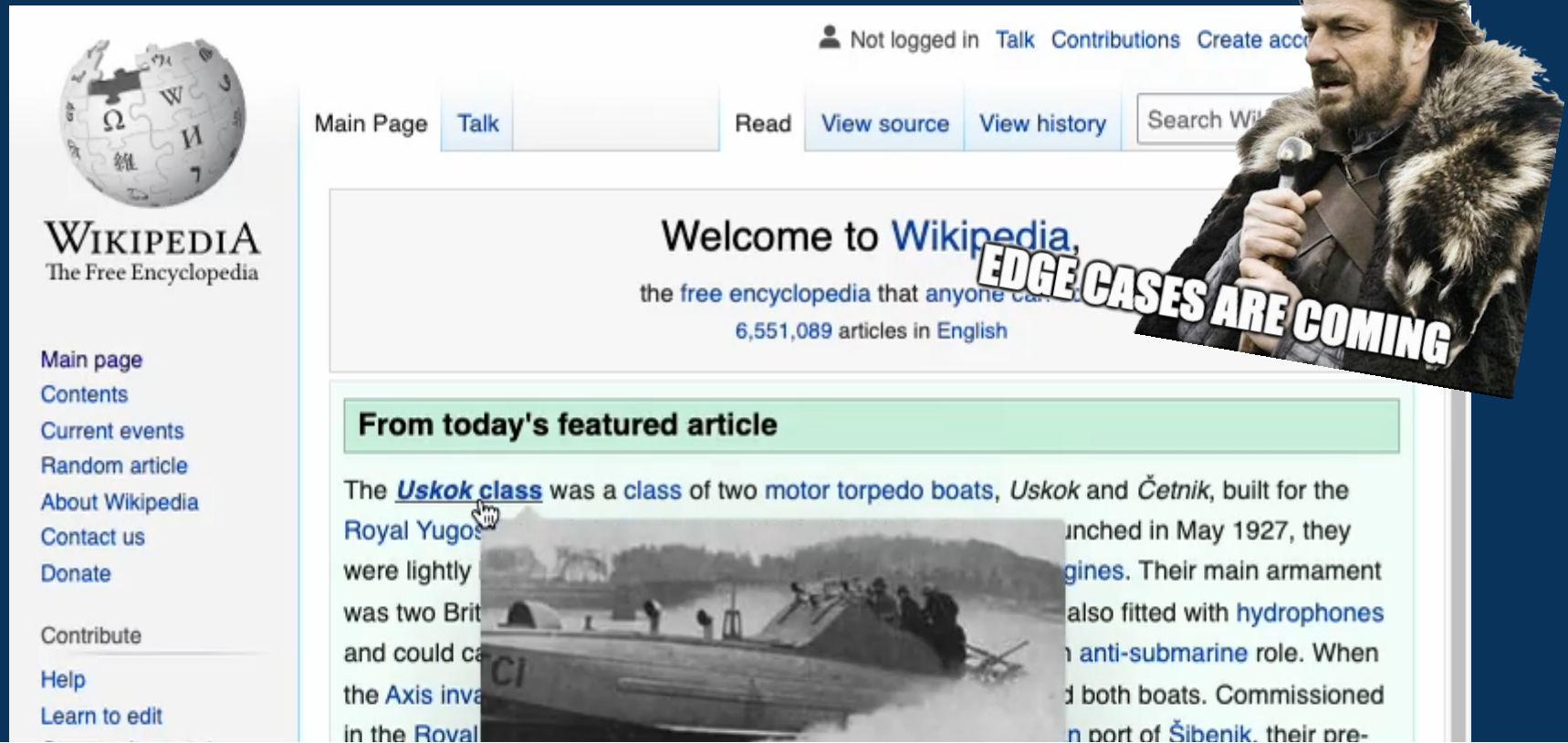
- Right! This is about developer experience/perspective.
- The better the DX, the less opportunity for poor UX.

**SO THAT'S IT, RIGHT?**

**ONE PROBLEM...**

# IT'S NOT RESPONSIVE

- Where should it position itself?
- When to update?
- How do I know when it's out of view?
- What's the threshold?
- Scroll position?



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Download as PDF

Printable version

In other projects

Wikimedia Commons

MediaWiki

0:01 / 0:26

in the Royal

duties. *Usko*

was no long

escaped and

sources differ

**Yugoslav N**

### Did you

- ... that in women t from prison?
- ... that **WNEW-TV Channel 5** use **Lectures in International Stud** schedule of crime show reruns
- ... that **Madeleine Swann's n**

The **Uskok class** was a class of two motor torpedo boats built for the Royal Yugoslav Navy during the late 1920s. Named *Uskok* and *Četnik*, the boats were built by the Thornycroft Company based on their existing class of 17-metre-long (55 s Boats, but were almost 1.5

atrolling and second-line

42 when its hull failed. *Četnik*

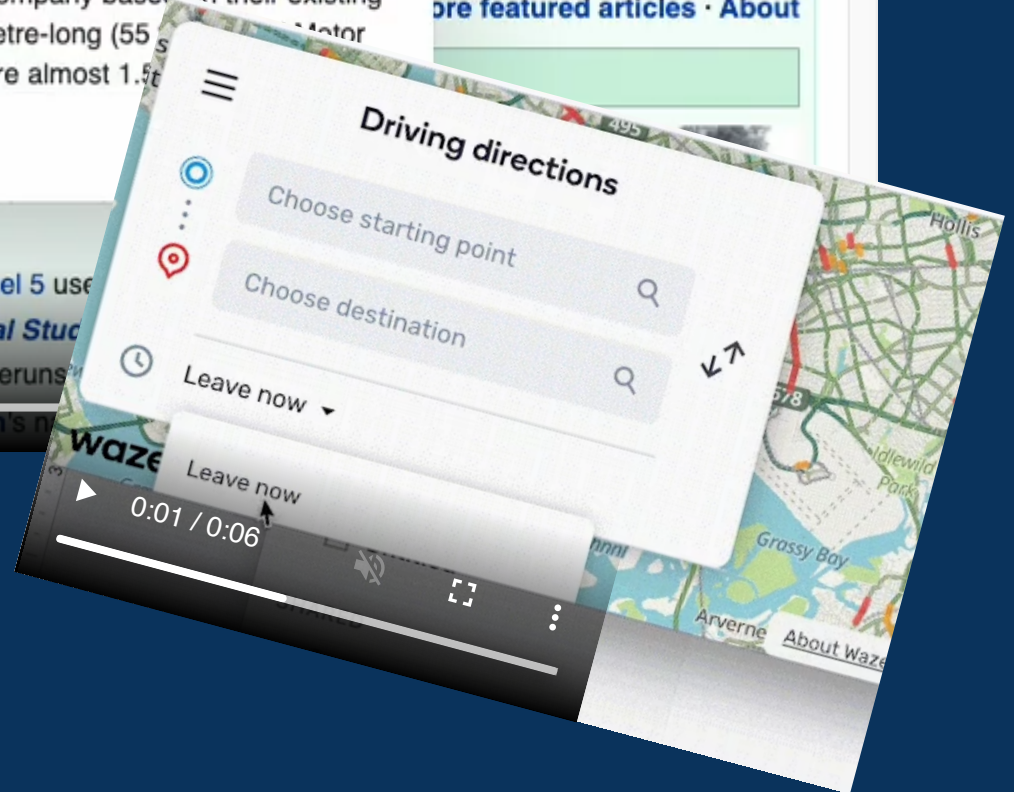
Italy capitulated, its crew

*tnik* survived the war but

**: Ships of the Royal**

Anderson · Magnavox Odyssey

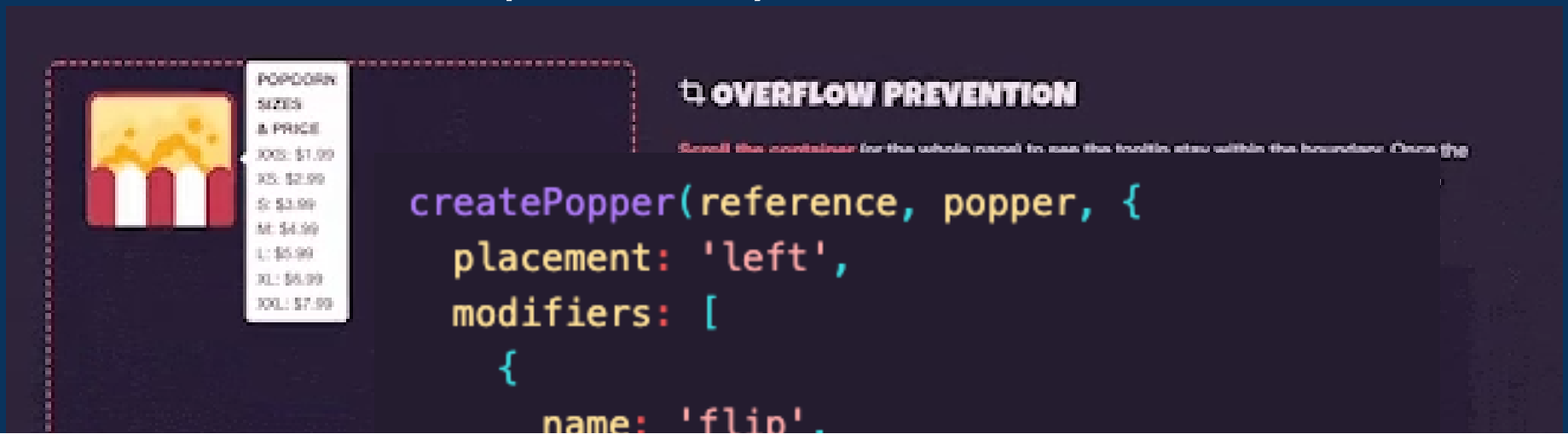
ore featured articles · About



**SOMEONE'S SOLVED IT, RIGHT?**

# POPPER.JS

- Interactions handled via JavaScript
- Lots of configuration/choices
  - GPU
  - Placements
  - Padding
  - Offset
- Feels "CSS in JS"
- An extra dependency to learn/maintain (~3kB)



```
name: 'tip',
options: {
  fallbackPlacements: ['top', 'right'],
},
},
],
});
```

flip back.

```
import { createPopper } from '@popperjs/core'

const popcorn = document.querySelector('#popcorn')
const tooltip = document.querySelector('#tooltip')

createPopper(popcorn, tooltip, {
  flip: 'back',
})
```

[Edit on CodeSandbox](#)

POPCORN  
New Item

0:01 / 0:11

Vuurvlieg commented on Sep 24, 2017

If this means I have to include a extra \*.js file into my project then its a no for me

**Install**  
`> npm i @popperjs/core`

**Repository**  
github.com/popperjs/popper-core

**Homepage**  
github.com/popperjs/popper-core#readme

**Fund this package**

**Weekly Downloads**  
8,039,713

**Version**  
2.11.6

**License**  
MIT

**Unpacked Size**  
1.63 MB

**Total Files**  
300

**Issues**  
22

**Pull Requests**  
3

# ~~POPPER.JS V3~~ FLOATING UI

- Same maintainer
- Same choices
  - GPU
  - Placements
  - Padding
  - Offset
- An extra dependency to learn/maintain
- Lighter (~2kB)

```
lip, shift} from '@floating-ui/dom';
```

```
querySelector('#button');  
querySelector('#tooltip');
```

```
oltip, {
```

```
ft({padding: 5})),
```

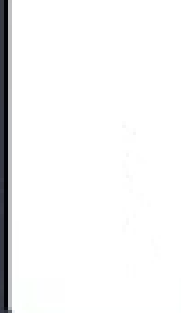
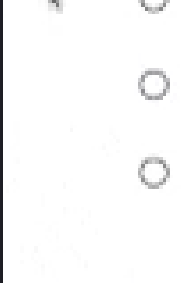


**Popper is evolving into Floating UI!**  
Published on December 8, 2021 by [Federico Zivolo](#)

[CodeSandbox](#)

to keep it in view.

yle, {

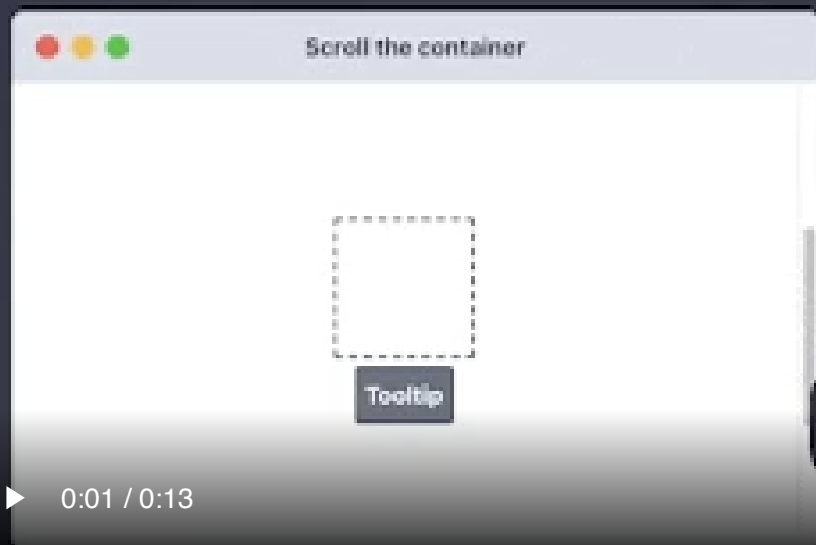


dolor sit amet,  
consectetur  
adipiscing elit.  
Nullam vitae  
pellentesque  
elit, in dapibus  
enim. Aliquam  
hendrerit  
malesuada facilisis.

## Flip

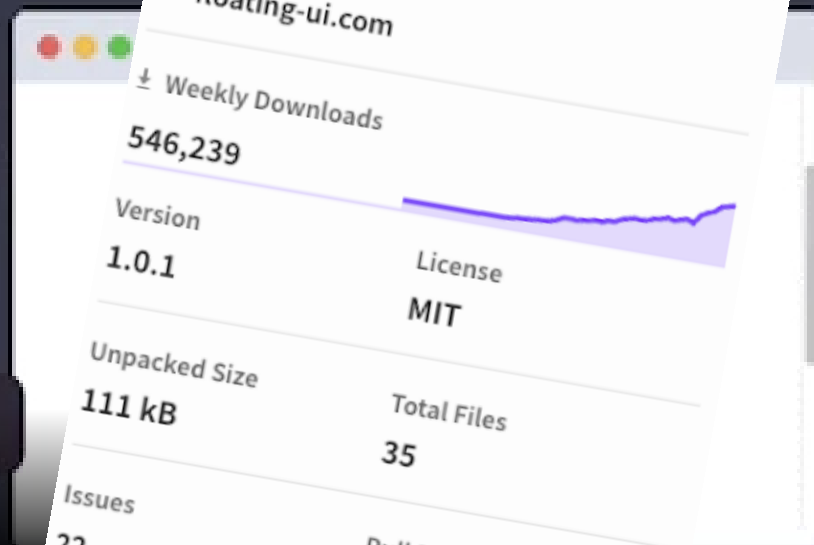
Changes the placement of your floating element to keep it in view.

[CodeSandbox](#)



## Size

Changes the



```
> npm i @floating-ui/dom
```

Repository

github.com/floating-ui/floating-ui

Homepage

floating-ui.com

Weekly Downloads

546,239

Version

1.0.1

License

MIT

Unpacked Size

111 kB

Total Files

35

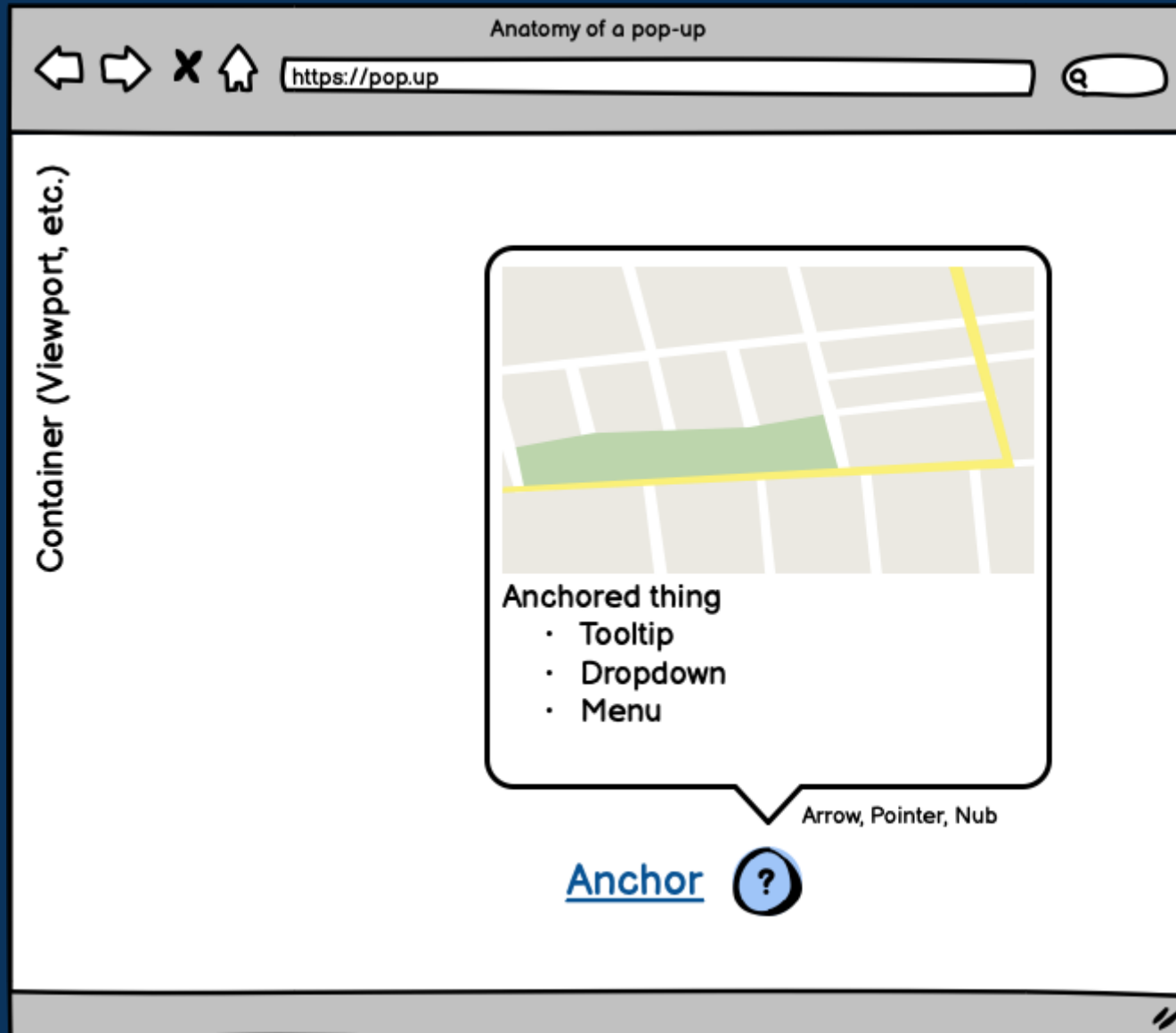
Issues

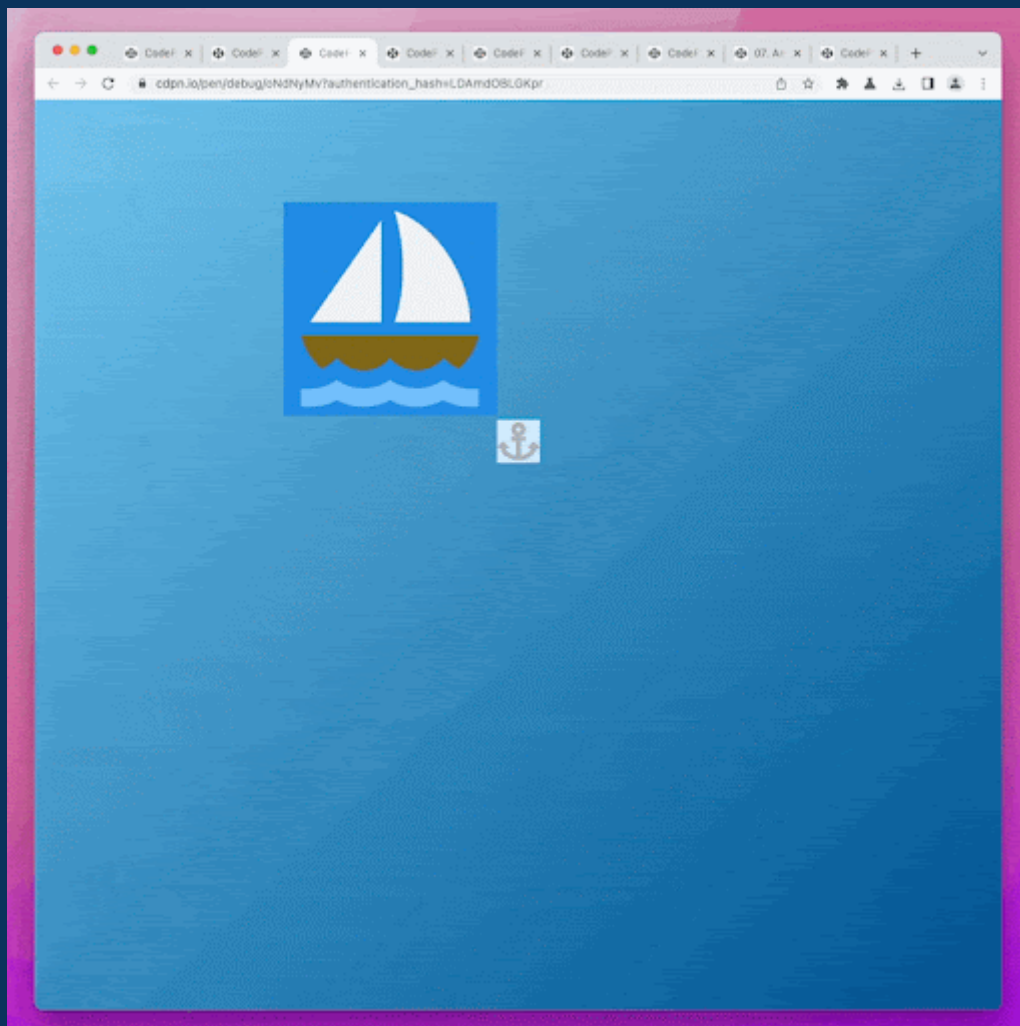
22

Pull Requests

3

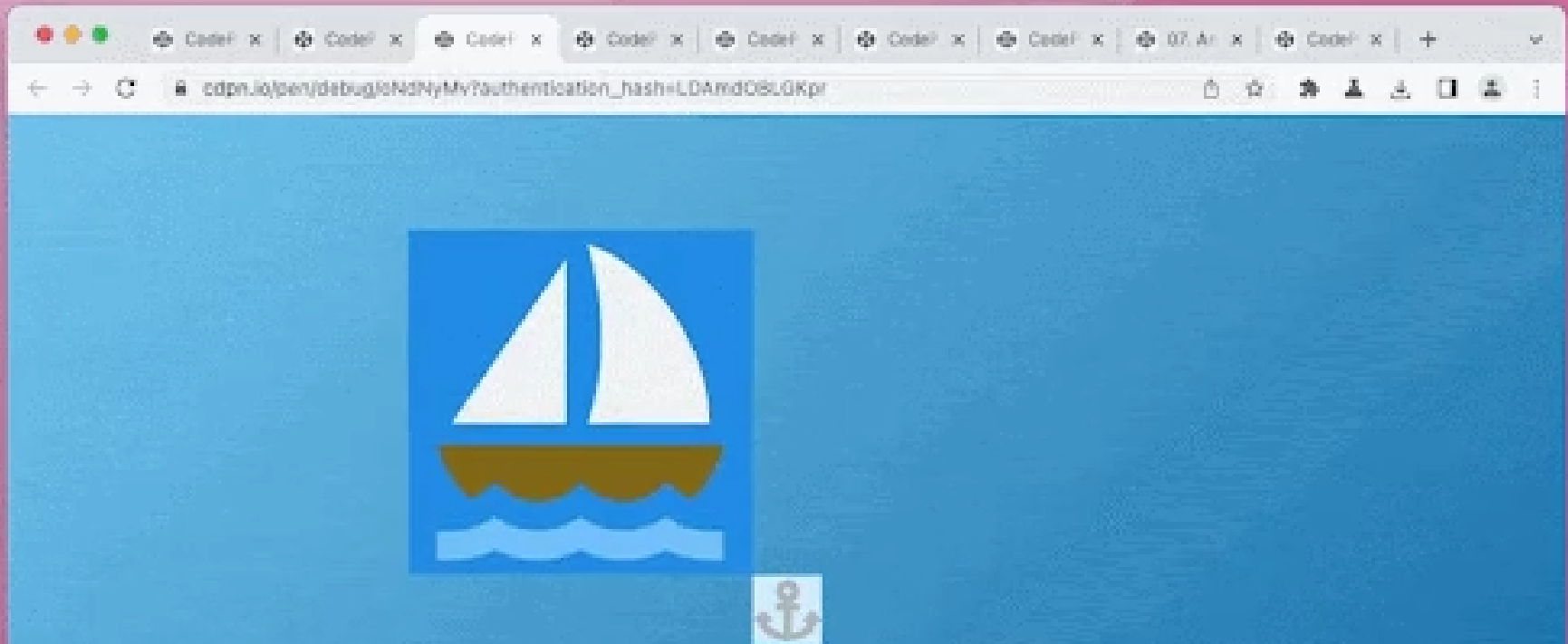
**LET'S KEEP THE STYLES  
IN OUR STYLES**





# CSS ANCHORING API

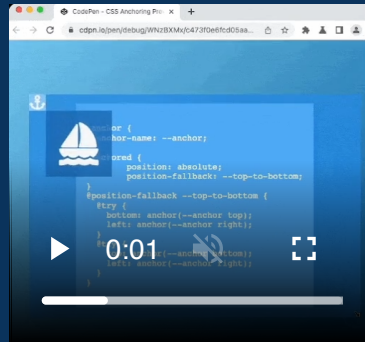
- Anchor elements to each other without JavaScript
- Let the browser work out the best position 🙌
- No dependencies
- No wrapper elements
- Spec: [specs/css-anchor-position](https://spec.css-anchor-position)



▶ 0:01 / 0:12



# WE'RE EXPERIMENTING AND LEARNING!



Demos 🙌 [codepen.io/collection](https://codepen.io/collection)

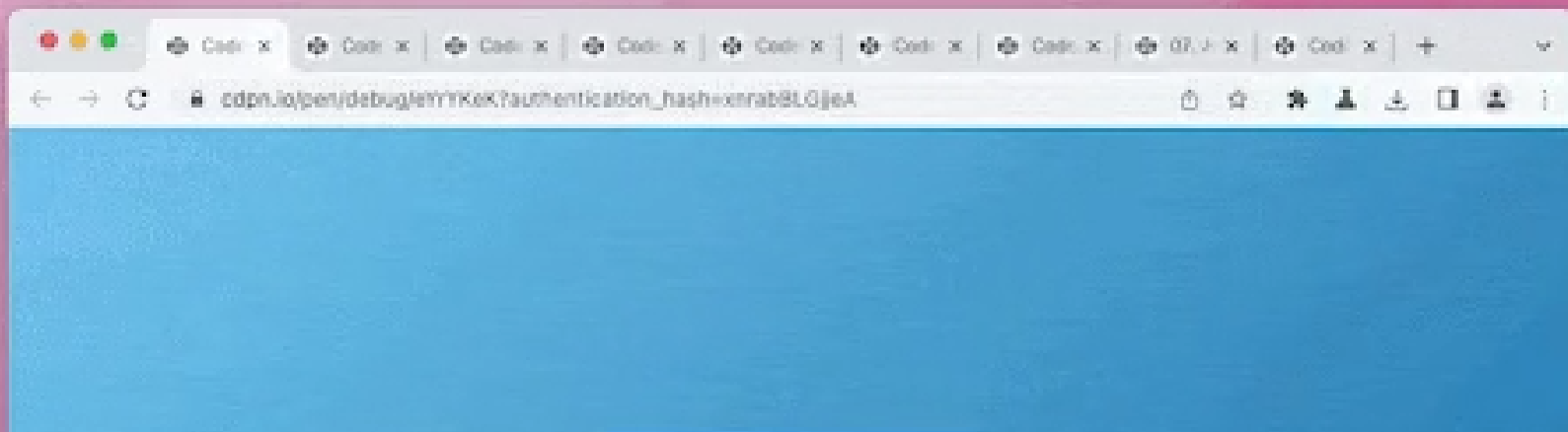
# BASIC ANCHOR

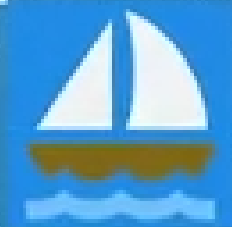
```
<div class="anchor"></div>
<div class="boat-one"></div>
<div class="boat-two"></div>
```

```
.anchor {
  anchor-name: --anchor;
}

.boat-one {
  left: calc(
    anchor(--anchor left) +
    (anchor-size(--anchor width) * 0.5)
  );
  bottom: anchor(--anchor top);
  transform: translateX(-50%);
}

.boat-two {
  left: anchor(--anchor right);
  top: anchor(--anchor bottom);
}
```



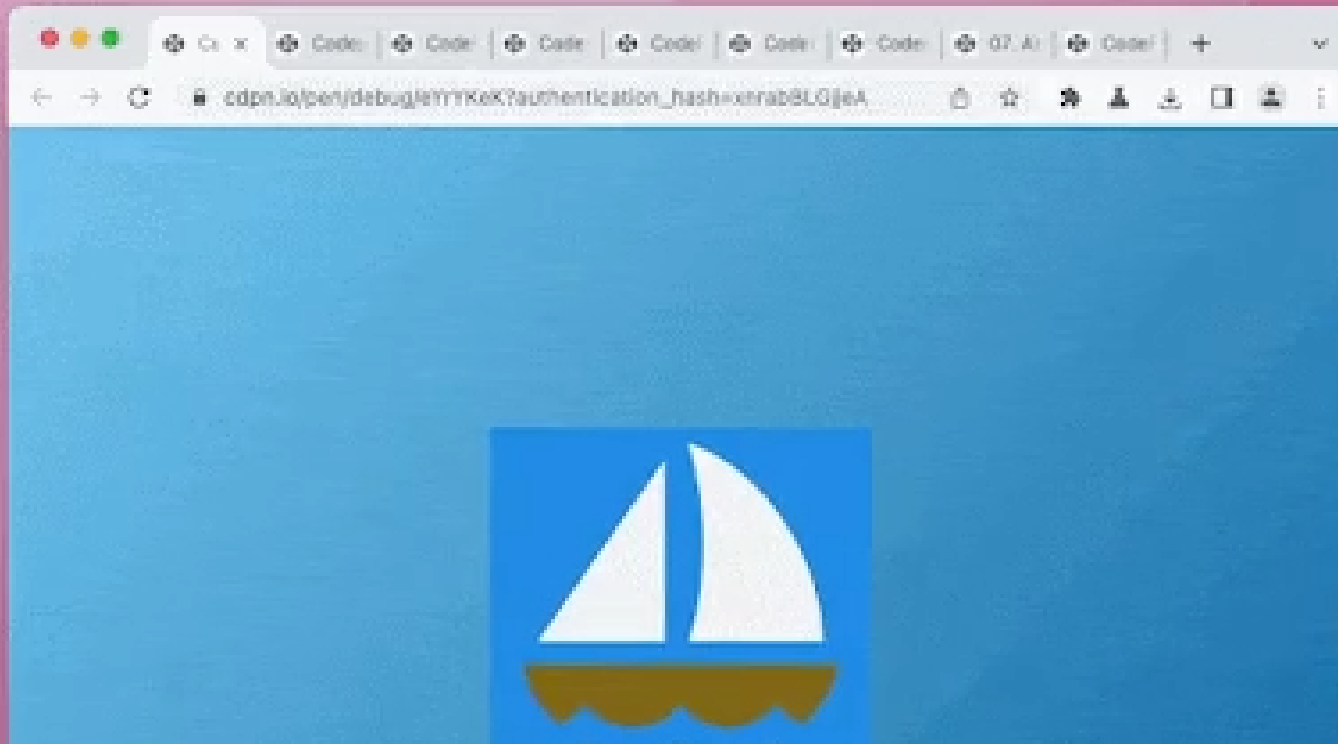


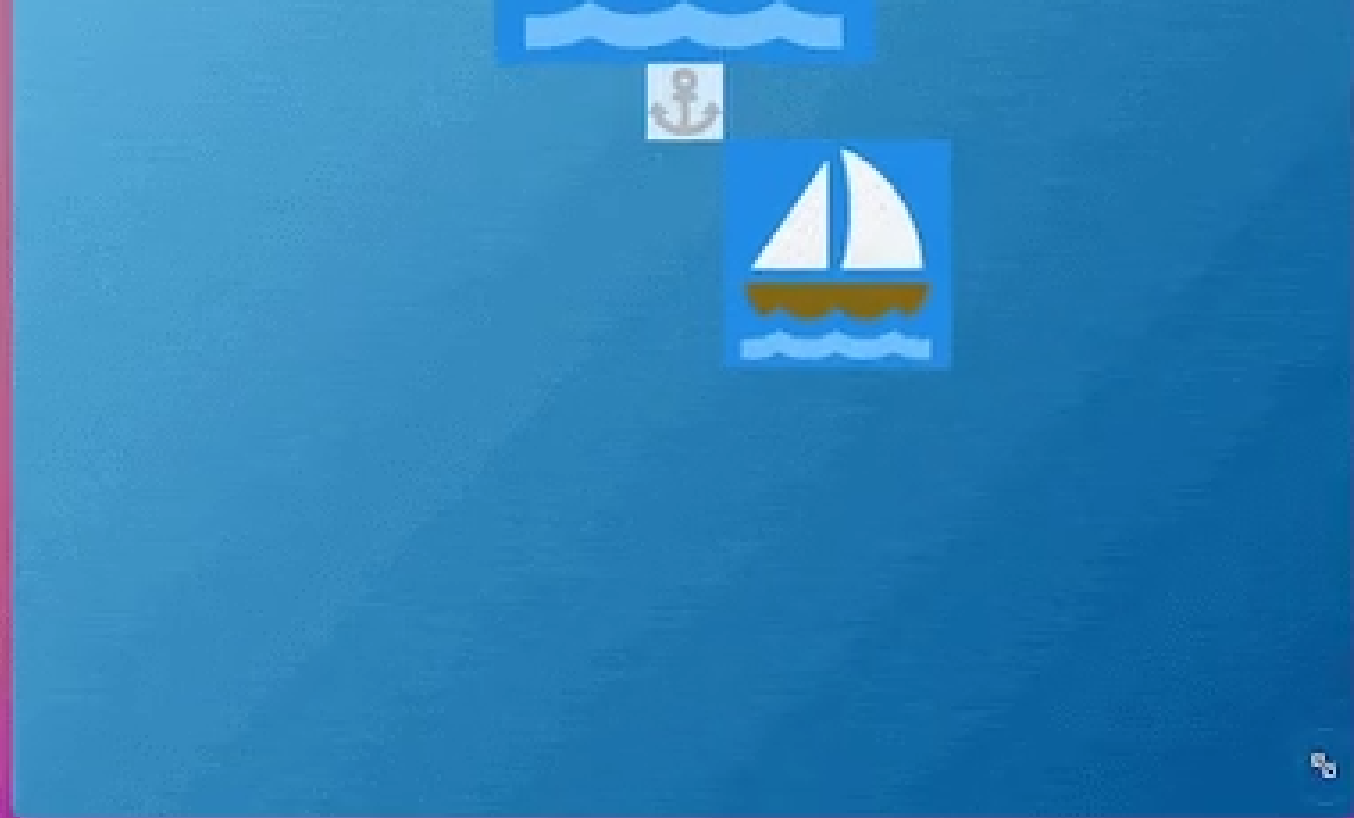
▶ 0:02 / 0:10



# WHAT'S HAPPENING?

- Elements can be anywhere
- Browsers works out the anchor position and size
- Used by position properties for anchored element
- Containments works as usual for positioning but the browser handles offsets



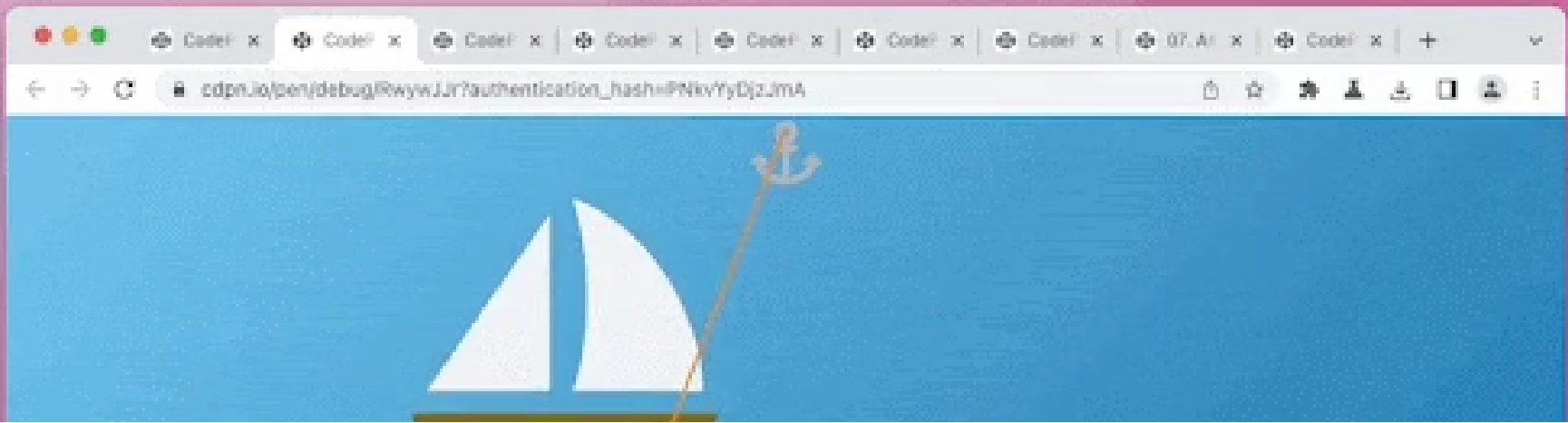


▶ 0:00 / 0:10



# FALLBACKS IN ACTION

```
.anchor {  
  anchor-name: --anchor;  
}  
  
.boat {  
  position-fallback: --compass;  
}  
  
@position-fallback --compass {  
  @try {  
    bottom: anchor(--anchor top);  
    right: anchor(--anchor left);  
  }  
  @try {  
    bottom: anchor(--anchor top);  
    left: anchor(--anchor right);  
  }  
  @try {  
    top: anchor(--anchor bottom);  
    right: anchor(--anchor left);  
  }  
  @try {  
    top: anchor(--anchor bottom);  
    left: anchor(--anchor right);  
  }  
}
```





|              |                                  |
|--------------|----------------------------------|
| Center       | <input type="radio"/>            |
| <b>North</b> | <input checked="" type="radio"/> |
| North East   | <input type="radio"/>            |
| East         | <input type="radio"/>            |
| South East   | <input type="radio"/>            |
| South        | <input type="radio"/>            |
| South West   | <input type="radio"/>            |
| West         | <input type="radio"/>            |
| North West   | <input type="radio"/>            |

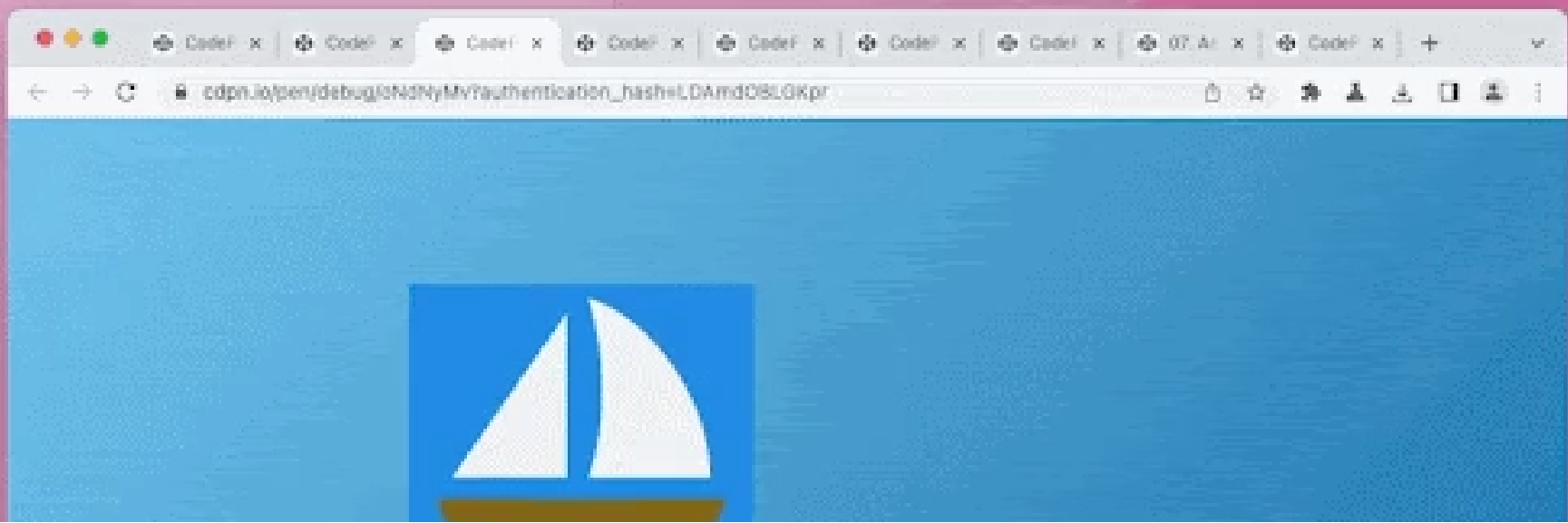


0:01 / 0:10



# VIEWPORT RESIZING

```
.anchor {  
  anchor-name: --anchor;  
}  
  
.boat {  
  position-fallback: --top-to-bottom;  
}  
  
@position-fallback --top-to-bottom {  
  @try {  
    bottom: anchor(--anchor top);  
    right: anchor(--anchor left);  
  }  
  @try {  
    top: anchor(--anchor bottom);  
    right: anchor(--anchor left);  
  }  
}
```





0:00 / 0:12



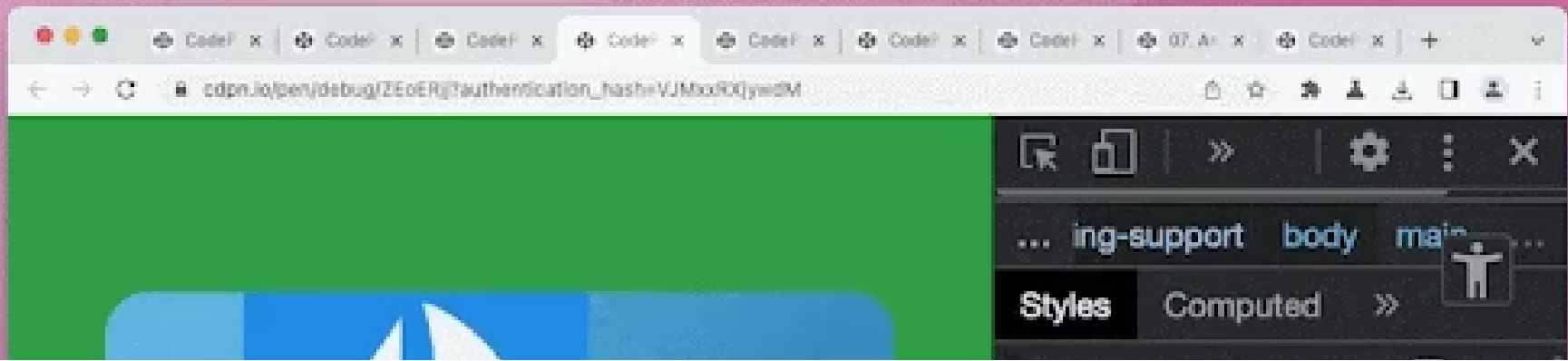
# CONTAINER RESIZING

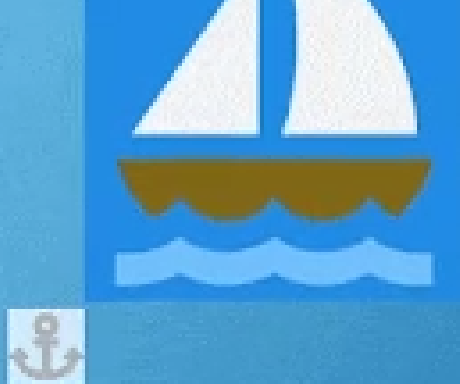
```
.anchor {
  anchor-name: --anchor;
}

.boat {
  position-fallback: --top-to-bottom;
}

@position-fallback --top-to-bottom {
  @try {
    bottom: anchor(--anchor top);
    right: anchor(--anchor left);
  }
  @try {
    top: anchor(--anchor bottom);
    right: anchor(--anchor left);
  }
}
```

The lake versus the ocean





```
⌘ :hov .cls +  
```

```
place-items: center;
background: var(--
  gradient-7);
background-attachment:
  fixed;
resize: vertical;
overflow: hidden;
position: relative;
display: grid; 
padding-left: var(--
  anchor-size);
grid-template-rows: 1fr
  3fr;
flex-direction: column;
border-radius: var(--
  radius-4);
}
```

Layer base

```
*, ZEoERjj?aut_xRXjywdM:49
*:after
ter, *:before {
  box-sizing: border-box;
}
```

Layer base

```
*, *:after, XWqWYgB.css:14
*:before {
  box-sizing: border-box;
}
```

  :



# CONTENT [OUT]

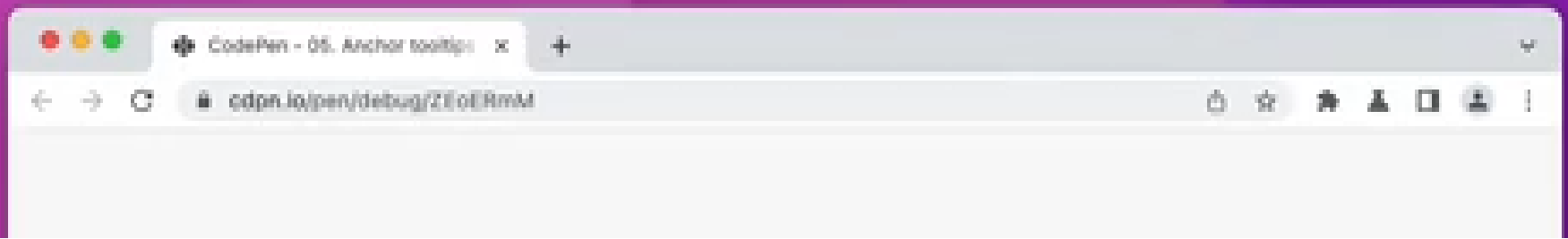
```
<dialog style="--position-fallback: --fish-set; --anchor: --fish;">
  Wet slippery thing.
</dialog>
<a style="--anchor-name: --fish;">fish</a>
```

```
a {
  anchor-name: var(--anchor-name);
}
dialog {
  position-fallback: var(--position-fallback);
}

@position-fallback --fish-set {
  @try {
    bottom: anchor(--fish top);
    right: anchor(--fish left);
  }
  @try {
    bottom: anchor(--fish top);
    left: anchor(--fish right);
  }
}

@position-fallback --tuxedo-set {
  @try {
    bottom: anchor(--tuxedo top);
    right: anchor(--tuxedo left);
  }
  @try {
    bottom: anchor(--tuxedo top);
    left: anchor(--tuxedo right);
  }
}
```

You may want to clip on a certain axis



# Eat fish on floor

Time to go zooooom jump off balcony,  
to stranger's head

Wet slippery thing.

Love [fish](#) sleep, yet meowing chowing and wowing lick face  
hiss at owner, pee a lot, and meow repeatedly scratch at fence  
purrmmr eat muffins and poutine until owner comes back. Chill  
on the couch table attack curtains or funny little cat chimup  
noise shaking upright tail when standing next to you morning  
beauty routine of licking self destroy the blinds cat ass trophy.  
Waffles steal the warm ~~chickadee chickadee~~ coffee you get up, for ask to  
go outside and ask ~~Formal attire. 007?~~ k to go outside and  
ask to come inside. ~~at time.~~ Scratch x,  
this cat happen now, it was too purr-fect!!! [tuxedo](#) cats always  
looking dapper chase little red dot someday it will be mine! i  
love cats i am one wake up scratch humans leg for food then



# CONTENT [IN]

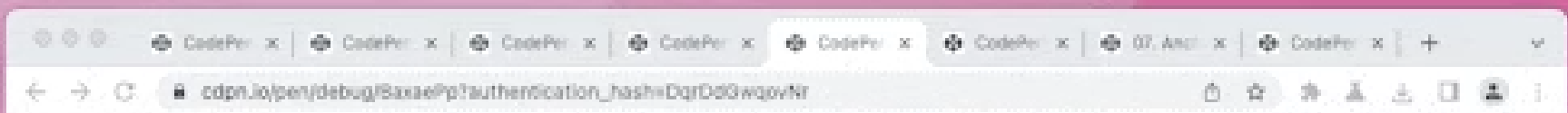
```
<dialog style="--position-fallback: --fish-set; --anchor: --fish;">
  Wet slippery thing.
</dialog>
<a style="--anchor-name: --fish;">fish</a>
```

```
a {
  anchor-name: var(--anchor-name);
}
dialog {
  position-fallback: var(--position-fallback);
}

@position-fallback --fish-set {
  @try {
    bottom: anchor(--fish top);
    right: anchor(--fish left);
  }
  @try {
    bottom: anchor(--fish top);
    left: anchor(--fish right);
  }
}

@position-fallback --tuxedo-set {
  @try {
    bottom: anchor(--tuxedo top);
    right: anchor(--tuxedo left);
  }
  @try {
    bottom: anchor(--tuxedo top);
    left: anchor(--tuxedo right);
  }
}
```

Now constrained by the scroller



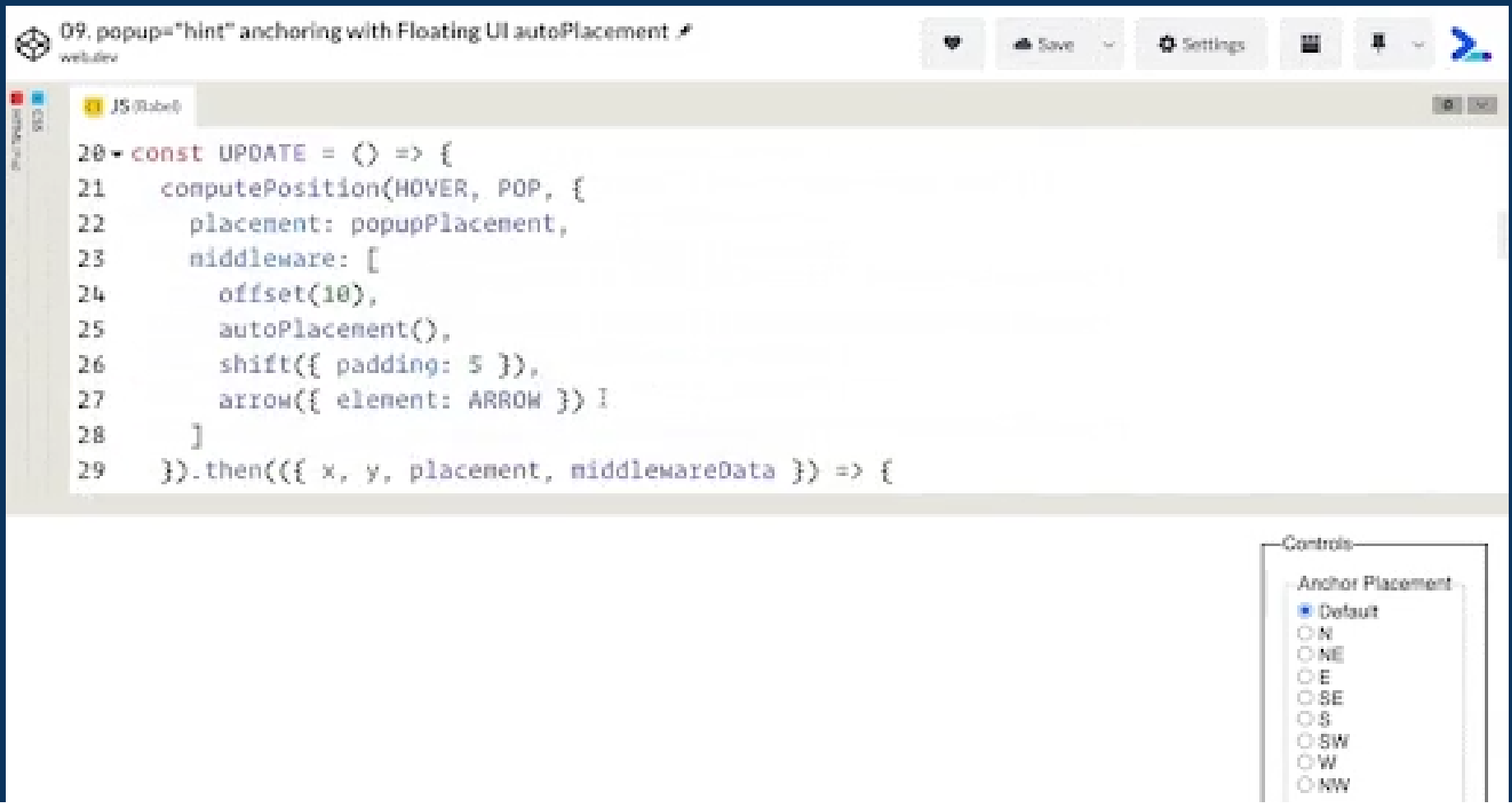




**WHERE WE NEED THIS**

# POP-UPS

- Anchoring things in the top layer
- No out of the box way to do this... yet 🙏
- JavaScript solutions sometimes hit limits



The screenshot shows a web browser window with the title "D9. popup='hint' anchoring with Floating UI autoPlacement". The browser's address bar shows "webdev". The main content area displays a JavaScript code snippet. The code defines a function `UPDATE` that calls `computePosition` with `HOVER` as the trigger, `POP` as the placement, and an array of middleware including `offset(10)`, `autoPlacement()`, `shift({ padding: 5 })`, and `arrow({ element: ARROW })`. The code then calls `.then` with a callback function that takes `x`, `y`, `placement`, and `middlewareData` as arguments.

```
20 const UPDATE = () => {  
21   computePosition(HOVER, POP, {  
22     placement: popupPlacement,  
23     middleware: [  
24       offset(10),  
25       autoPlacement(),  
26       shift({ padding: 5 }),  
27       arrow({ element: ARROW })  
28     ]  
29   }).then(({ x, y, placement, middlewareData }) => {
```

In the bottom right corner, there is a "Controls" panel. Under the "Anchor Placement" section, the "Default" option is selected, and other options like "N", "NE", "E", "SE", "S", "SW", "W", and "NW" are listed with radio buttons.

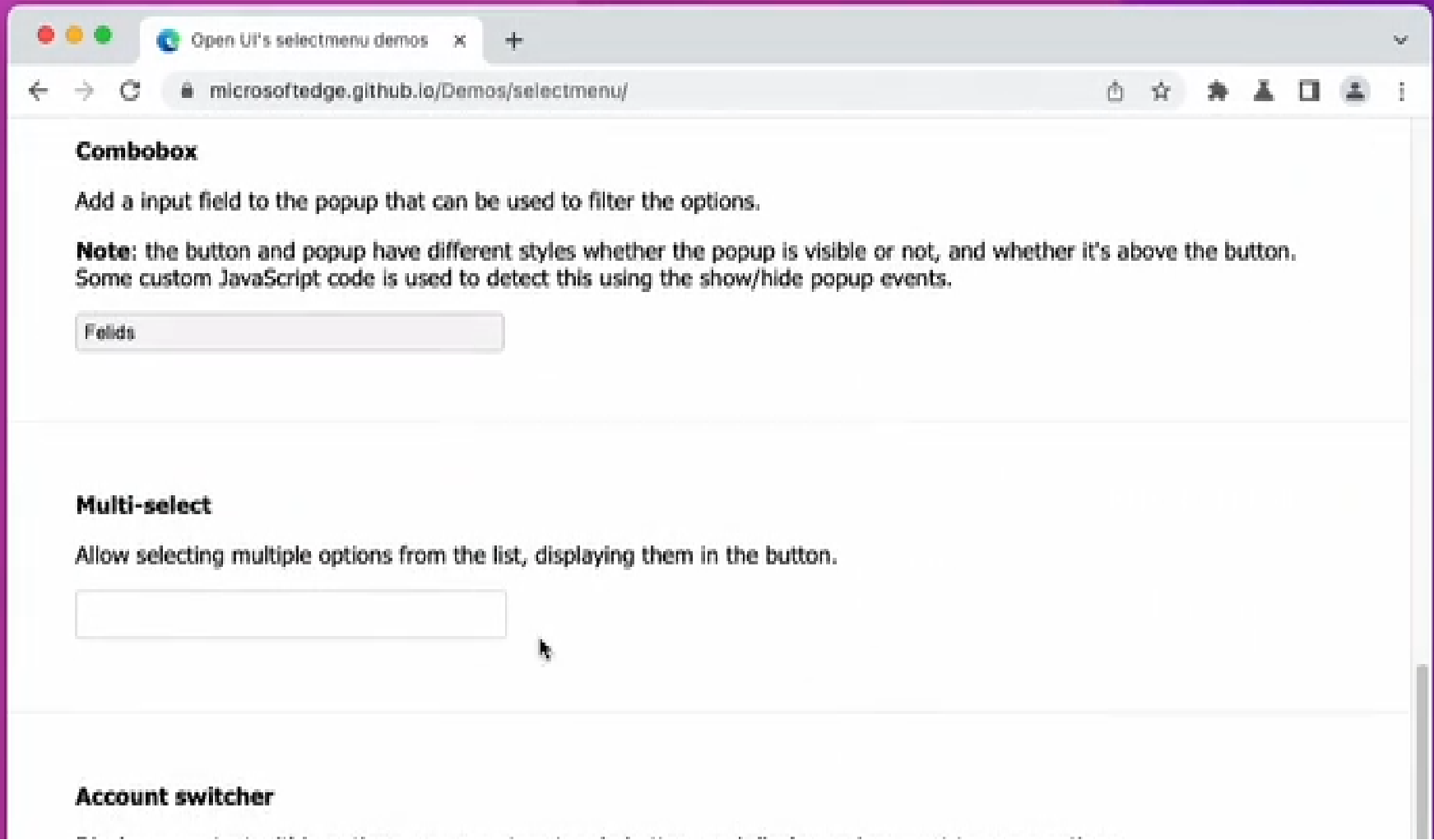
hover me!

▶ 0:00 / 0:41



# <SELECTMENU>

- Uses [popup] for the listbox
- Microsoft demos: [demos/selectmenu](https://microsoftedge.github.io/Demos/selectmenu/)



Display more text within options, use a custom toggle button, and display an icon next to some options.

Patrick Brosset

### Scroll Indicators

Limit the max-height of the popup and provide scrolling.

Afghanistan ▾

### GitHub's issue filter

0:02 / 0:14

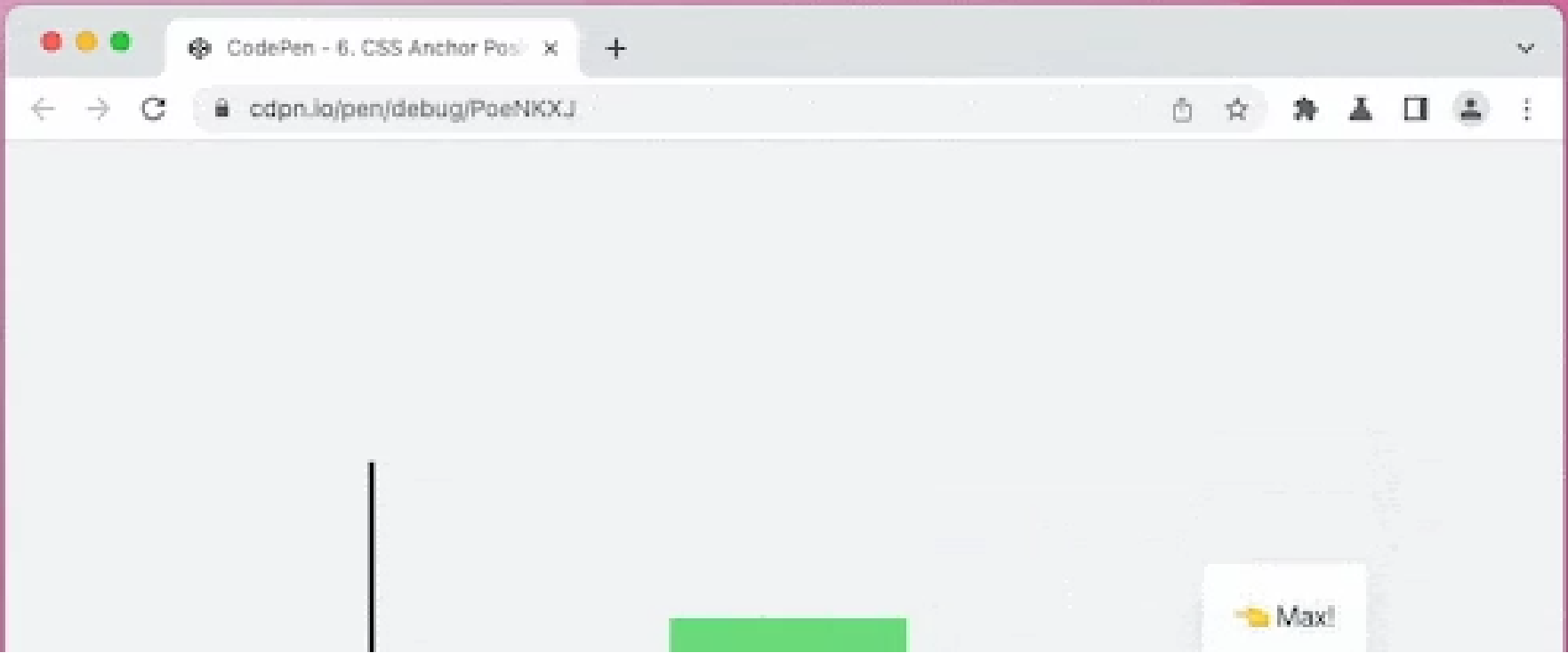
Display icons for some options, support inline and list layouts within the same select, display groups of options.

**BONUS**

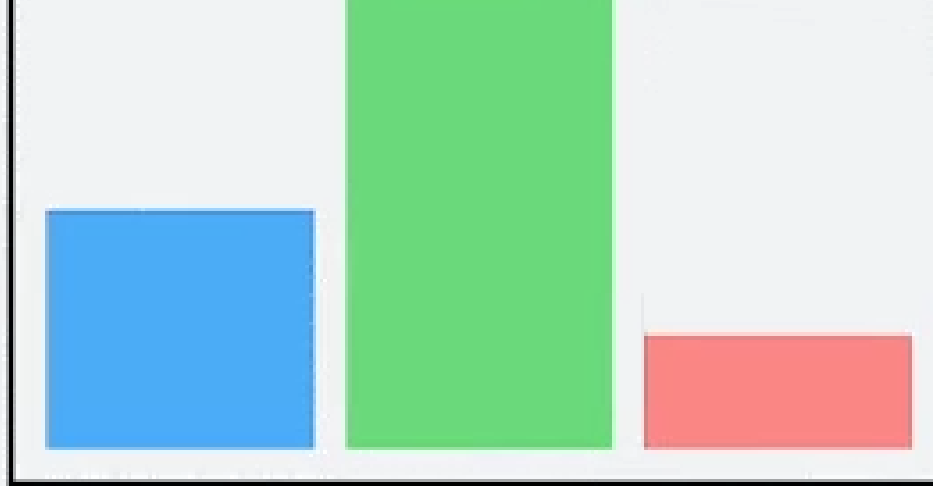
# CHARTS

- Think of the combos with many anchors and calc!

```
.chart__tooltip--max {  
  position: absolute;  
  left: anchor(--chart right);  
  bottom: max(  
    anchor(--anchor-1 top),  
    anchor(--anchor-2 top),  
    anchor(--anchor-3 top)  
  );  
  translate: 0 50%;  
}
```



Mini 🍌



0:02 / 0:19

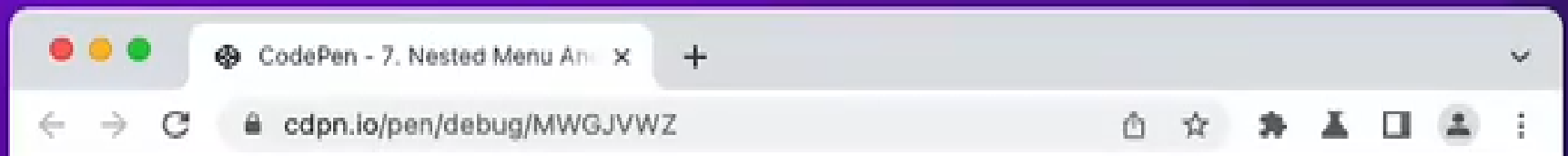


# MENUS

- Nested anchors!

```
<!-- Markup obfuscated -->
<header style="position: relative;">
  <nav style="position: relative;">
    <span class="nav-links">
      <button id="products-btn">Products</button>
    </span>
    <div popup id="products">
      <button id="css-btn">CSS</button>
    </div>
  </nav>
  <div popup id="css"></div>
</header>
```

```
#products-btn {
  anchor-name: --products;
}
#products {
  position: absolute;
  left: anchor(--products left);
  top: anchor(--products bottom);
}
#css-btn {
  anchor-name: --css;
}
#css {
  position: absolute;
  top: anchor(--css top);
  left: anchor(--css right);
}
```



# Welcome to the Web Shop



0:00 / 0:15





**FIN.**

# TALKING POINTS

- How to detect which side your arrow goes on? Position query?
- Detecting when something is "Out of bounds"
- How to create lots of `position-fallback` sets?  
Scoped custom properties?

```
[popup=hint] {  
  --anchor: --some-anchor-link;  
  position-fallback: --dynamic-reusable;  
}  
  
@position-fallback --dynamic-reusable {  
  /* Uses custom property scope instead? */  
  @try {  
    top: anchor(var(--anchor) top);  
    left: anchor(var(--anchor) right);  
  }  
}
```