

# All tooled up and nowhere to go?



# Lots of time to spend at home...





# Organising my clothes...

Clothes List ☆ ↗													Share		31	
File Edit View Insert Format Data Tools Add-ons Help Last edit was on 2 May																
100% £ % .0 .00 123 Default (Ari... 10 B I S A																
fx   T-Shirt																
	A	B	C	D	E	F	G	H	I	J	K	L				
1	T-Shirt	Write Drunk Edit	Strand Book Store													
2	T-Shirt	Google IO 2016	Google													
3	T-Shirt	Sweet Gwendolir	Aerzte													
4	T-Shirt	Atari Kanji	Atari													
5	T-Shirt	AtMedia2008	AtMedia													
6	T-Shirt	Religion Busters	Bad Religion													
7	T-Shirt	First BT	Beyond Tellerrand													
8	T-Shirt	BTConf Berlin 20	Beyond Tellerrand													
9	T-Shirt	BTConf Vic Lee	Beyond Tellerrand													
10	T-Shirt	BTConf Captain	Beyond Tellerrand													
11	T-Shirt	BTConf White He	Beyond Tellerrand													
12	T-Shirt	BTConf Comic S	Beyond Tellerrand													
13	T-Shirt	Five	Beyond Tellerrand													
14	T-Shirt	BTConf Seagull	Beyond Tellerrand													
15	T-Shirt	Bis Zum Bitteren	Die Toten Hosen													
16	T-Shirt	Pink Grey Stripes	Fat Face													
17	T-Shirt	I & hearts; Fronte	Fronteers													
18	T-Shirt	Google IO Grey	Google													
19	T-Shirt	Google IO Grey	Google													

# Tackling that box of cables...





# Tackling that box of cables...









# Developer Tools Edge(Chromium) PM Team

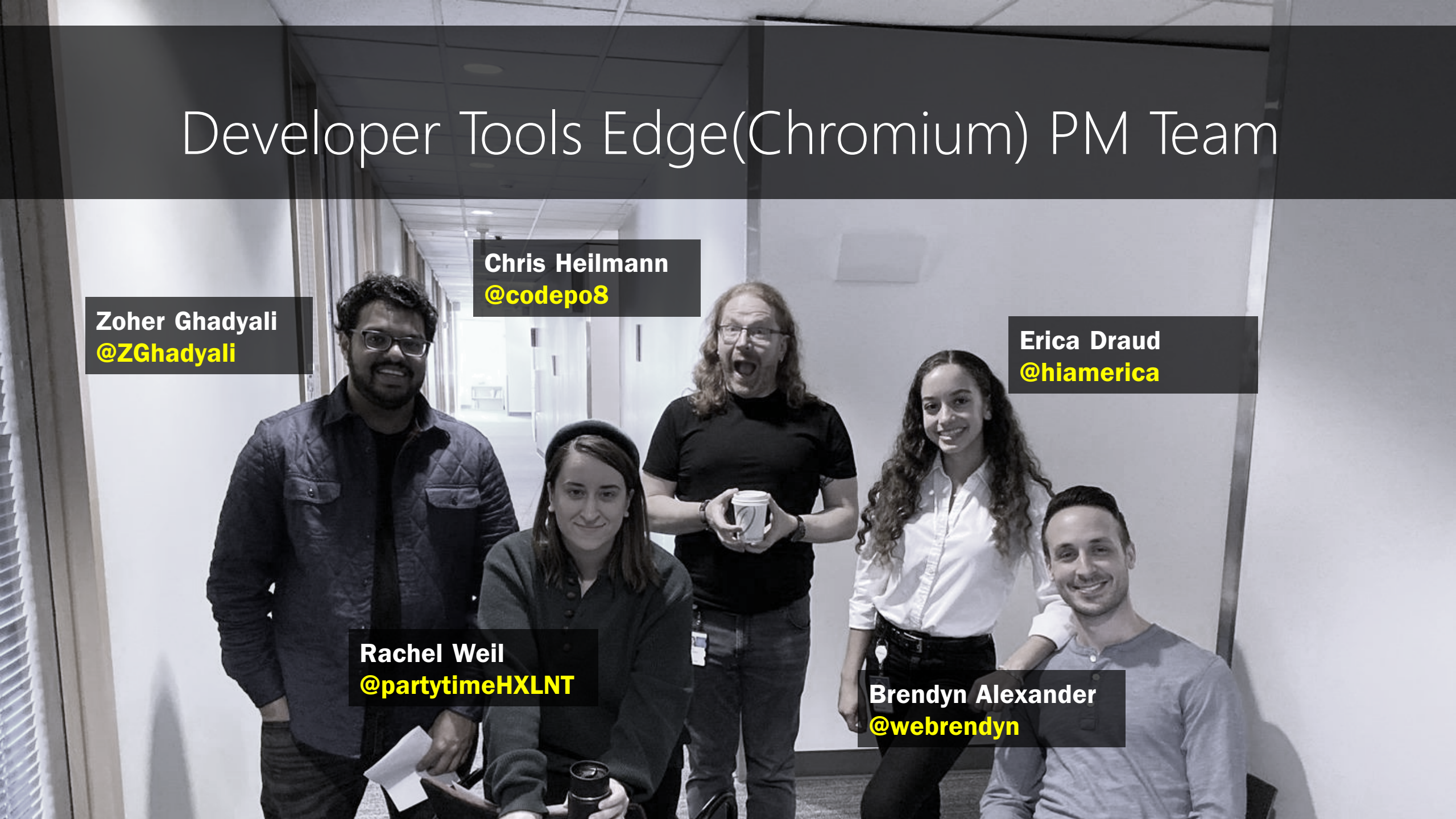
**Zoher Ghadyali**  
**@ZGhadyali**

**Chris Heilmann**  
**@codepo8**

**Erica Draud**  
**@hiamerica**

**Rachel Weil**  
**@partytimeHXLNT**

**Brendyn Alexander**  
**@webrendyn**



# A demands gap...

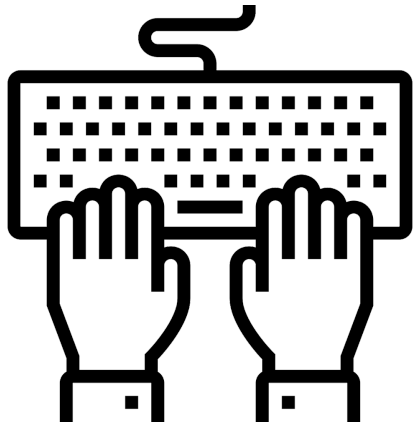
Useful, effective  
and pretty amazing  
things in devtools



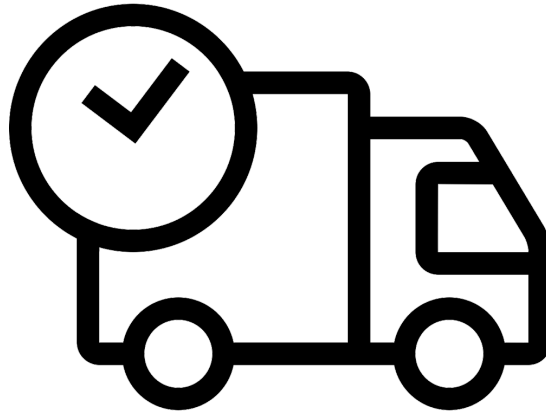
What we demand  
of the web...



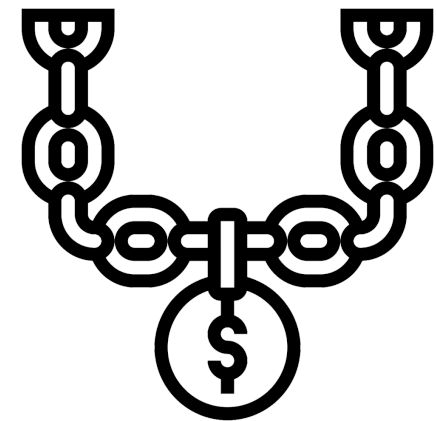
# An assumptions gap...



Build it!

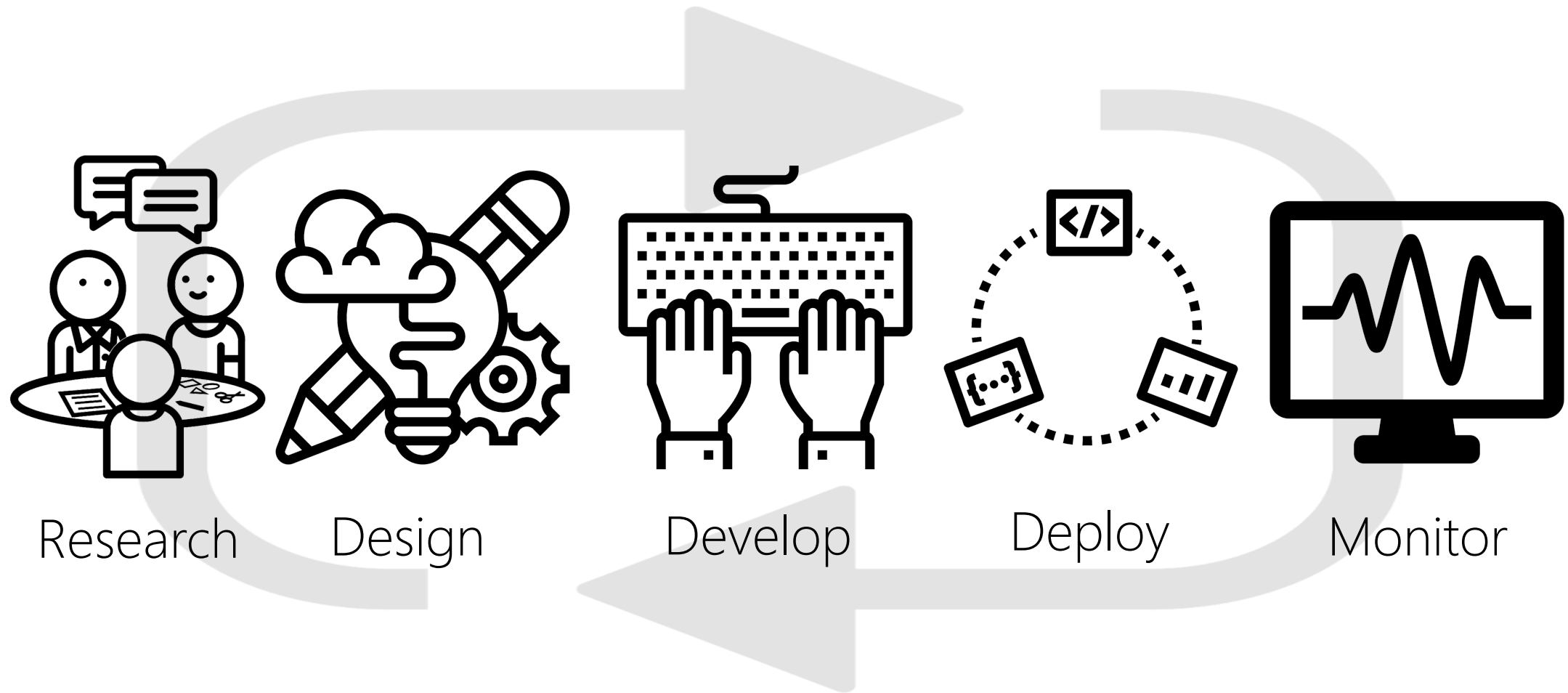


Ship it!



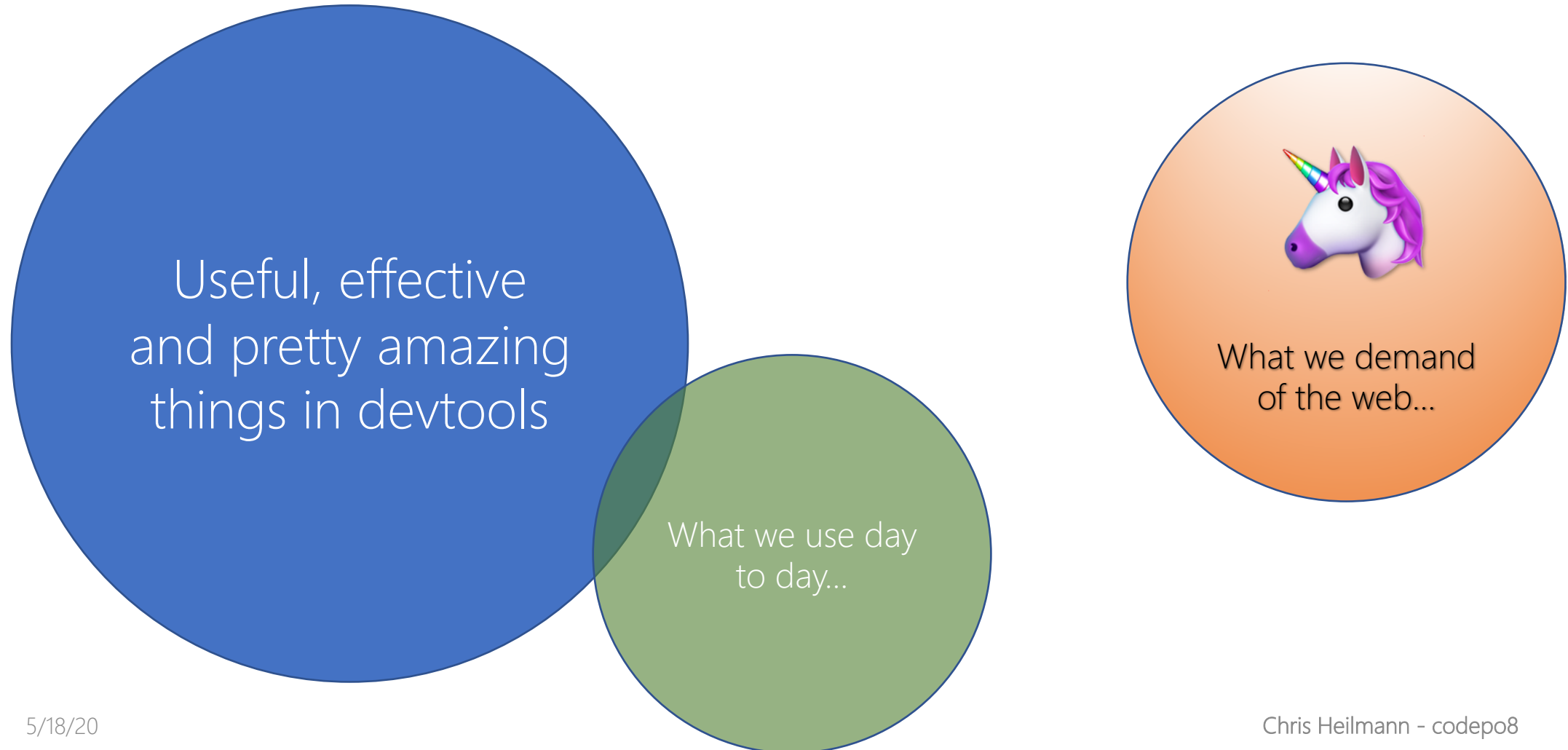
Great success!

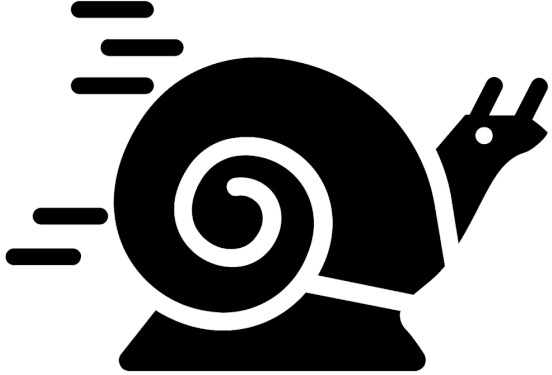
# Realities of great software projects...





# A demands gap...






Why are things  
"slow"?





- Security
- Privacy
- Performance
- Maintainability
- Ownership
- Backwards compatibility





# Use cases drive new features


 Azure DevOps


 Edge


 Overview


 Boards


 Work items


 Boards


 Backlogs

 Sprints

 Queries


 Plans






 Retrospectives

 Wiql Playground

5/18/20

microsoft / Edge / Boards / Work items

 Search

Work items

Assigned to me




+ New Work Item

Open in Queries

Column Options









Import Work Items

...

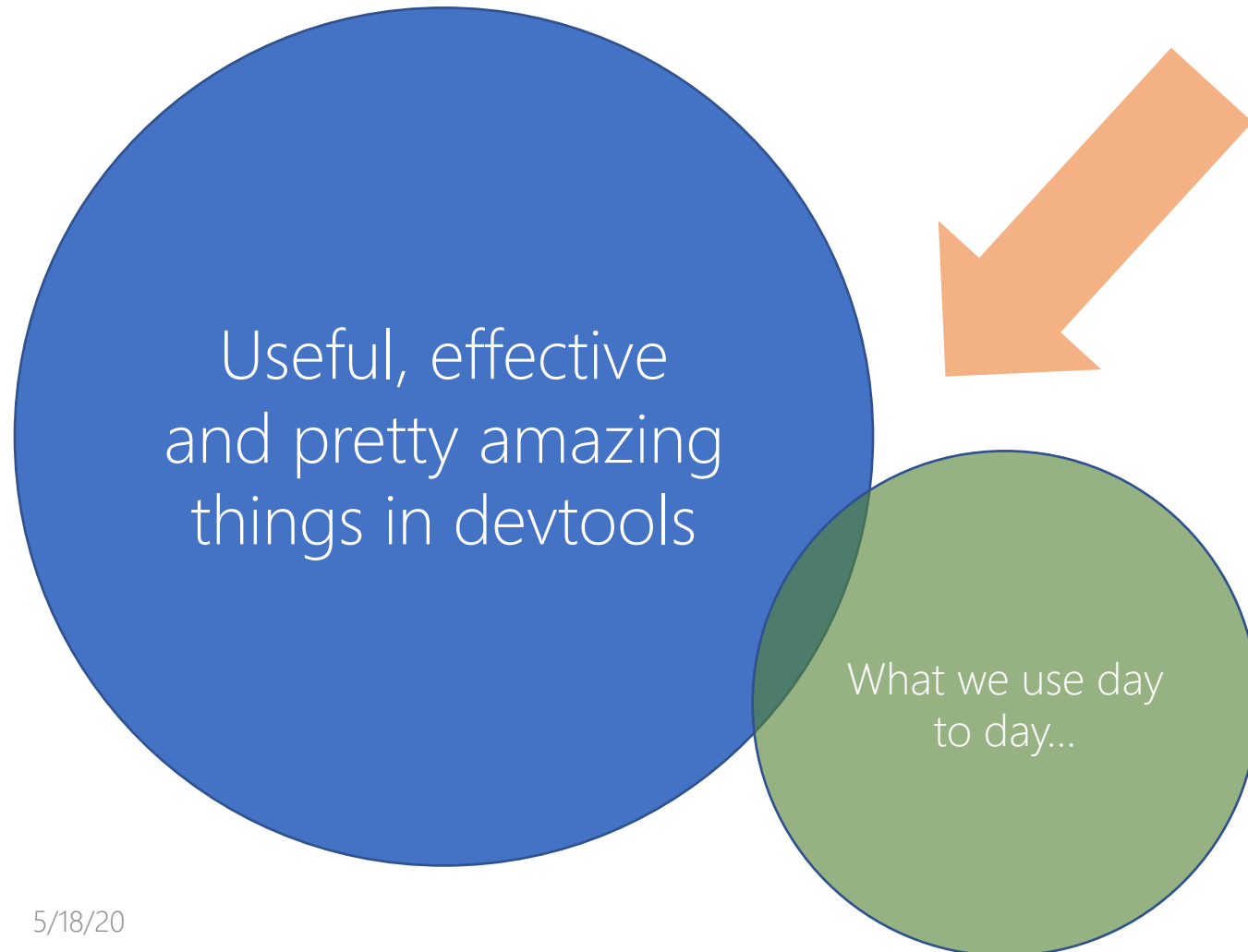
Filter by keyword

Types States Area Tags

ID	Title	State	Area Path	Tags
 244461...	 Feedback: Can you adjust colours and graph about computed...	Active	Edge\Dev Experience\DevTools	Accessibility
245363...	 Feedback: It would be really nice if new Edge included the same "d...	Active	Edge\Dev Experience\DevTools	EdgeAnahe
245209...	 Feedback: Can I hide this timeline, which is useless to me, but take...	Active	Edge\Dev Experience\DevTools	Network
240503...	 Feedback: Can i get a toggle to enable `prefers-color-scheme: dark...	Active	Edge\Dev Experience\DevTools	EdgeAnahe
245849...	 [Edge Insider] I was trying to use the new Elements for Visual Code...	Active	Edge\Dev Experience\DevTools	Code Edge
208044...	 Developers want easier tools for visualizing and editing fonts	Started	Edge\Dev Experience\DevTools	DesignDeve
213620...	 Developers want to view the DevTools in high contrast mode to m...	Started	Edge\Dev Experience\DevTools	DesignNee
191010...	Developers want a full accessibility tree/panel in DevTools	Committed	Edge\Dev Experience\DevTools	DesignNee

Chris Heilmann - codepo8 13

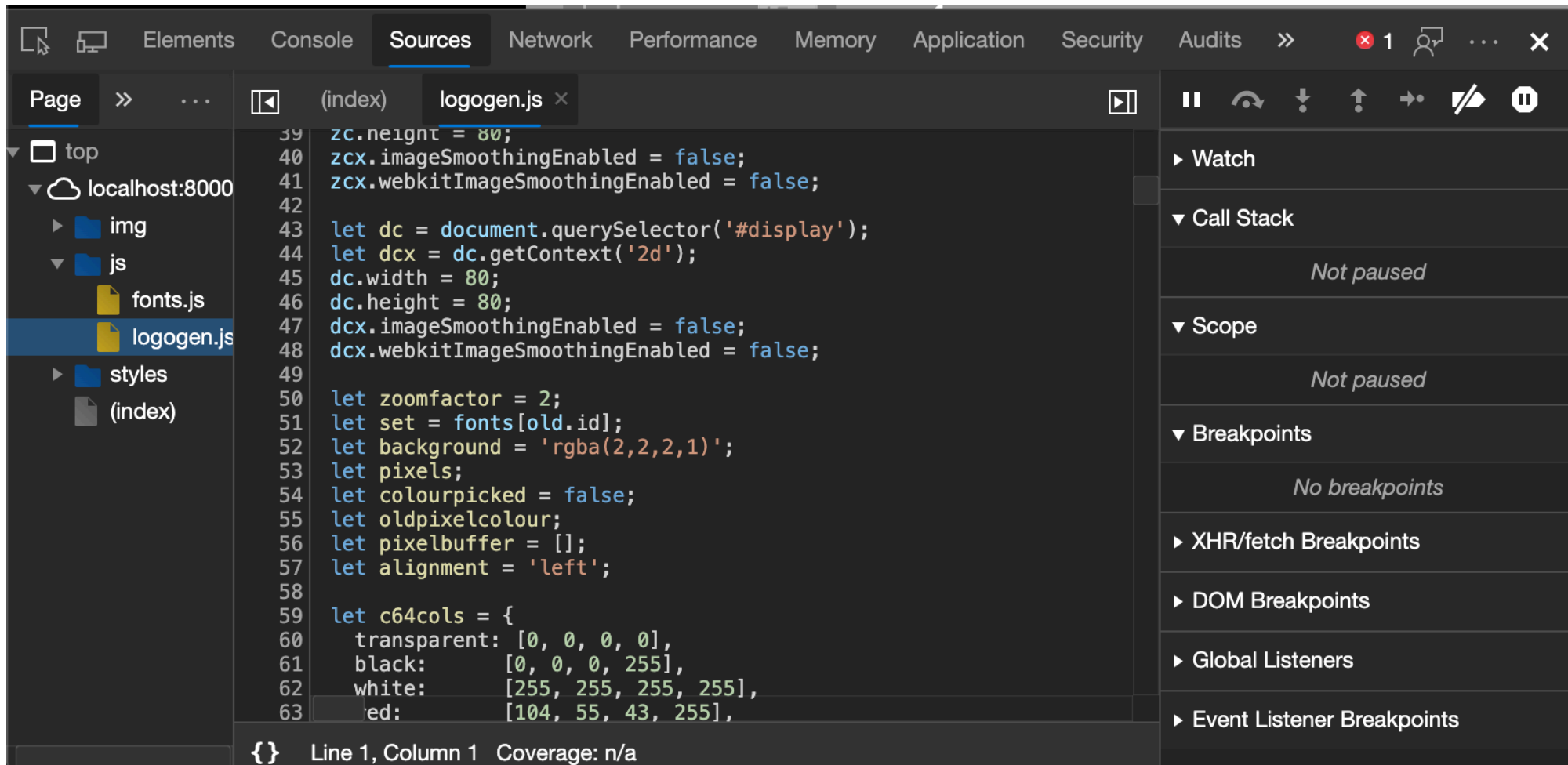
# Usage gap



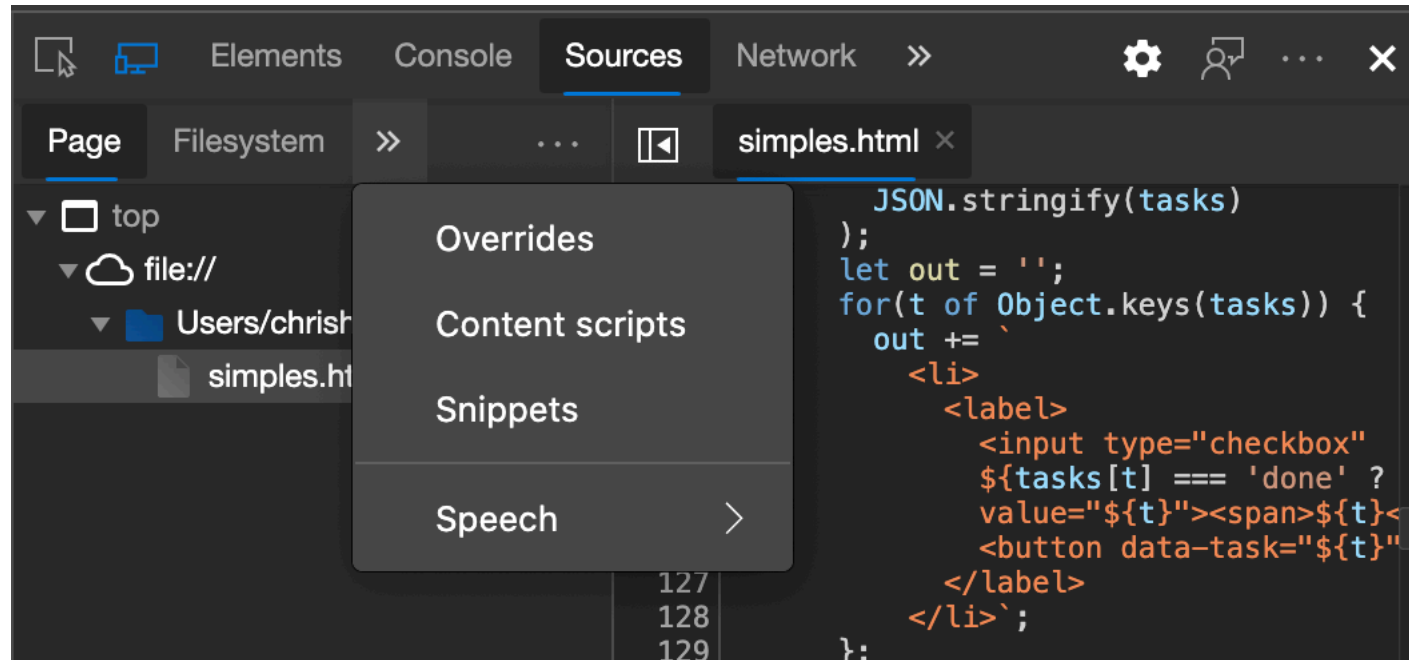




# Editor in the browser...



# Editor in the browser...



# Upgrading your dev experience...







Breakpoints >  
`console.log()`



- You can set breakpoints in the editor in the browser
- You can also set breakpoints in your text editor (f.e. Visual Studio Code)
- They are more work upfront than a `console.log()` - but worth it.



Breakpoints >  
`console.log()`

---

- Your code execution is paused – errors can't slip through
- You get an end-to-end picture of what is happening
- You are not likely to litter the web with yet another console message that end users should never see



# DOM breakpoints!



Task:

What do you need to do?

Add

buy cookies

get cookie consent





DOM  
breakpoints?



Task:

What do you need to do?

Add

buy cookies

get cookie con

← Back ⌘[

→ Forward ⌘]

↻ Refresh ⌘R

📄 Save As... ⌘S

🖨️ Print... ⌘P

📶 Cast Media to Device...

🗣️ Read Aloud ⇧⌘U

🗣️ Translate to English

📁 Add Page to Collections >

View Page Source ⌘U

View Frame Source

Refresh Frame

🔍 Inspect ⌘I

Task:  Add

buy cookies

get cookie consent

li 490.39 x 42

ACCESSIBILITY

Name

Role listitem

Keyboard-focusable

Responsive ▾852 x 73870% ▾Online ▾

ElementsConsoleSourcesNetworkPerformanceMemory

```
<!DOCTYPE html>
<html lang="en">
  <head>...</head>
  <body>
    <form>
      <div class="searchbar">...</div>
      <ul id="tasks">
        <li>...</li>
        ...
        <li> == $0
          <label>
            <input type="checkbox" value="get cookie consent">
            <span>get cookie consent</span>
            <button data-task="get cookie consent">x</button>
          </label>
        </li>
      </ul>
    </form>
  </body>
</html>
```

html body form ul#tasks li label span

StylesEvent ListenersDOM BreakpointsPropertiesAccessibility

Filter: :hov .cls +

element.style { }

li { list-style: none; padding: 5px; line-height: 1.2; }

position: 0

margin: -

border: -

padding: 5

... Console3D ViewWhat's NewWebAudioRenderingIssuesChanges



# DOM breakpoints!



Task:

What do you need to do?

Add

buy cookies

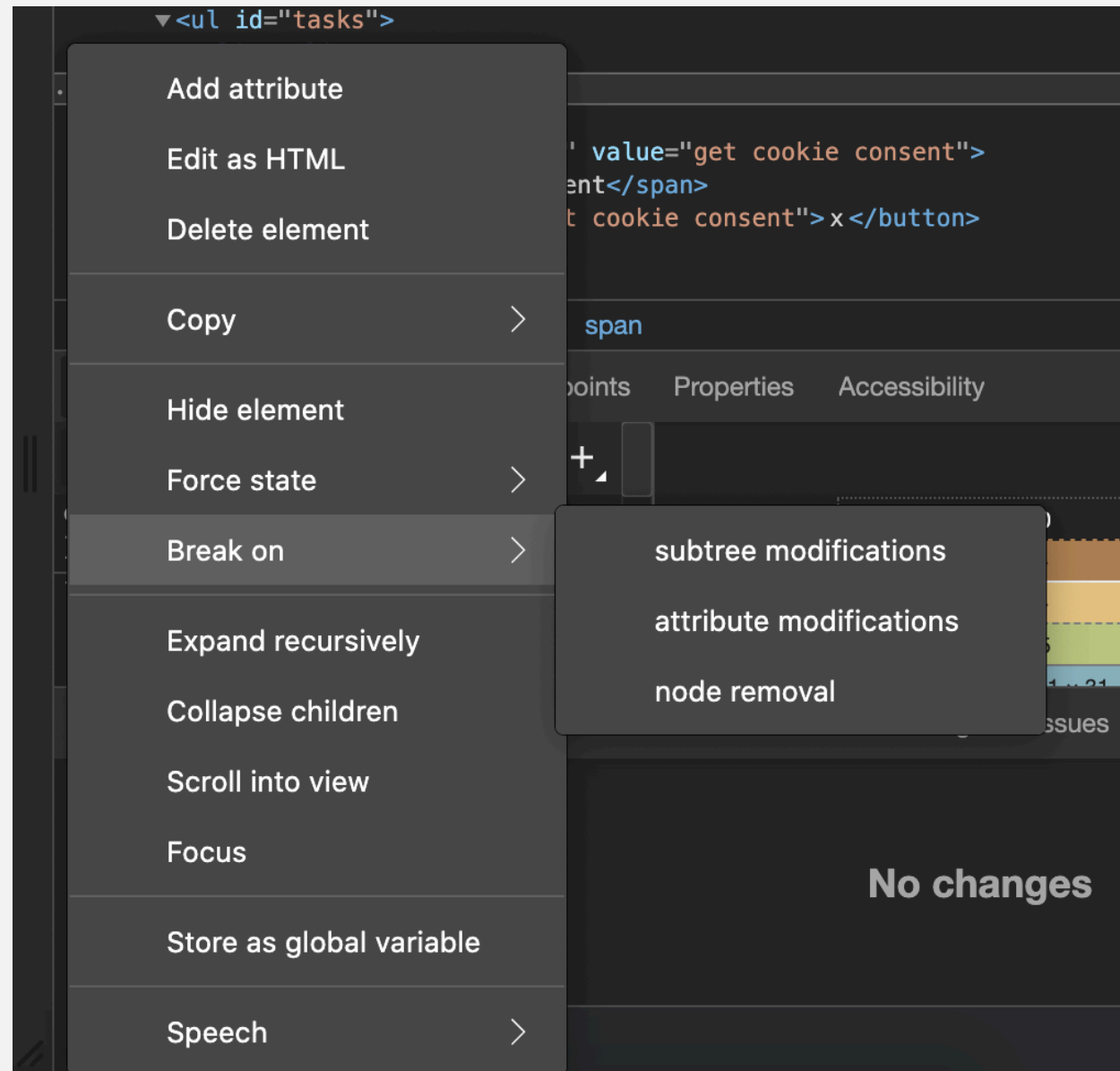
get cookie consent

```
▼ <ul id="tasks">
  ▶ <li>...</li>
  ...
  ▼ <li> == $0
    ▼ <label>
      <input type="checkbox" value="get cookie consent">
      <span>get cookie consent</span>
      <button data-task="get cookie consent">x</button>
    </label>
  </li>
```





# DOM breakpoints!



Responsive ▾852 × 73870% ▾Online ▾⛔⋮

Task: 

Paused in debugger ▶ ↺

Add

buy cookies ✕

get cookie consent

PageFilesystem >>...⏮simples.html ×

▼ top

▼ file://

▼ Users/chrisheilmann/Download

simples.html

116JSON.stringify(tasks)

117);

118let out = ''; out = "<li><label><input ty

119for(t of Object.keys(tasks)) {

120out += ` out = "<li><label><input type=

121<li>

122<label>

123<input type="checkbox"

124\${tasks[t] === 'done' ? 'checked' : ''}

125value="\${t}"><span>\${t}</span>

126<button data-task="\${t}"> x</button>

127</label>

128</li>`;

129};

130list.innerHTML = out;

131};

132

133const addTask = e => {

134if (task.value) {

135tasks[task.value] = 'active';

136updateList();

137task.value = '';

138}

139

{ } Line 130, Column 22 Coverage: n/a

5/18/20

Chris Heilmann - codepo8

26

Chromium DevTools interface showing the Sources panel.

**Top Bar:** Elements, Console, **Sources**, Network, Performance, Memory, Application, Security, Lighthouse, Layers.

**Left Panel (Filesystem):**

- Page
- Filesystem
  - top
  - file://
    - Users/chrisheilmann/Download
      - simples.html**
  - inspector://

**Code Editor (simples.html):**

```
142     const changeTask = e => { e = MouseEvent {isTrusted: true, scre
143       let t = e.target; t = button {disabled: false, form: form, fo
144       if (t.dataset.task) {
145         delete tasks[t.dataset.task];
146         updateList();
147         e.preventDefault();
148       }
149       if (t.nodeName.toLowerCase()=== 'input') {
150         tasks[t.value] = t.checked ? 'done' : 'active';
151         updateList();
152         e.preventDefault();
153       }
154     }
155
```

**Right Panel:**

- ☐ Pause on caught exceptions
- ▼ Call Stack
  - changeTask simples.html:144
- ▼ Scope
  - ▼ Local
    - e: MouseEvent {isTrusted: t...
    - t: button
    - this: undefined
  - ▶ Script
  - ▶ Global Window

**Status Bar:** {} Line 144, Column 13 Coverage: n/a



No need for a  
mouse!



## Shortcuts

`⌘ ↓` Decrement by 0.1

### Debugger

`F8` `⌘ \` Pause/ Continue

`F10` `⌘ '` Step over

`F11` `⌘ ;` Step into

`⇧ F11` `⌘ ⇧ ;` Step out

`Ctrl .` `Ctrl ,` Next/previous call frame

`Ctrl ⇧ E` Evaluate selection in  
console

`Ctrl ⇧ A` Add selection to watch

`⌘ B` Toggle breakpoint

`⌘ ⇧ B` Toggle breakpoint  
enabled

`⌘ F8` Toggle all breakpoints

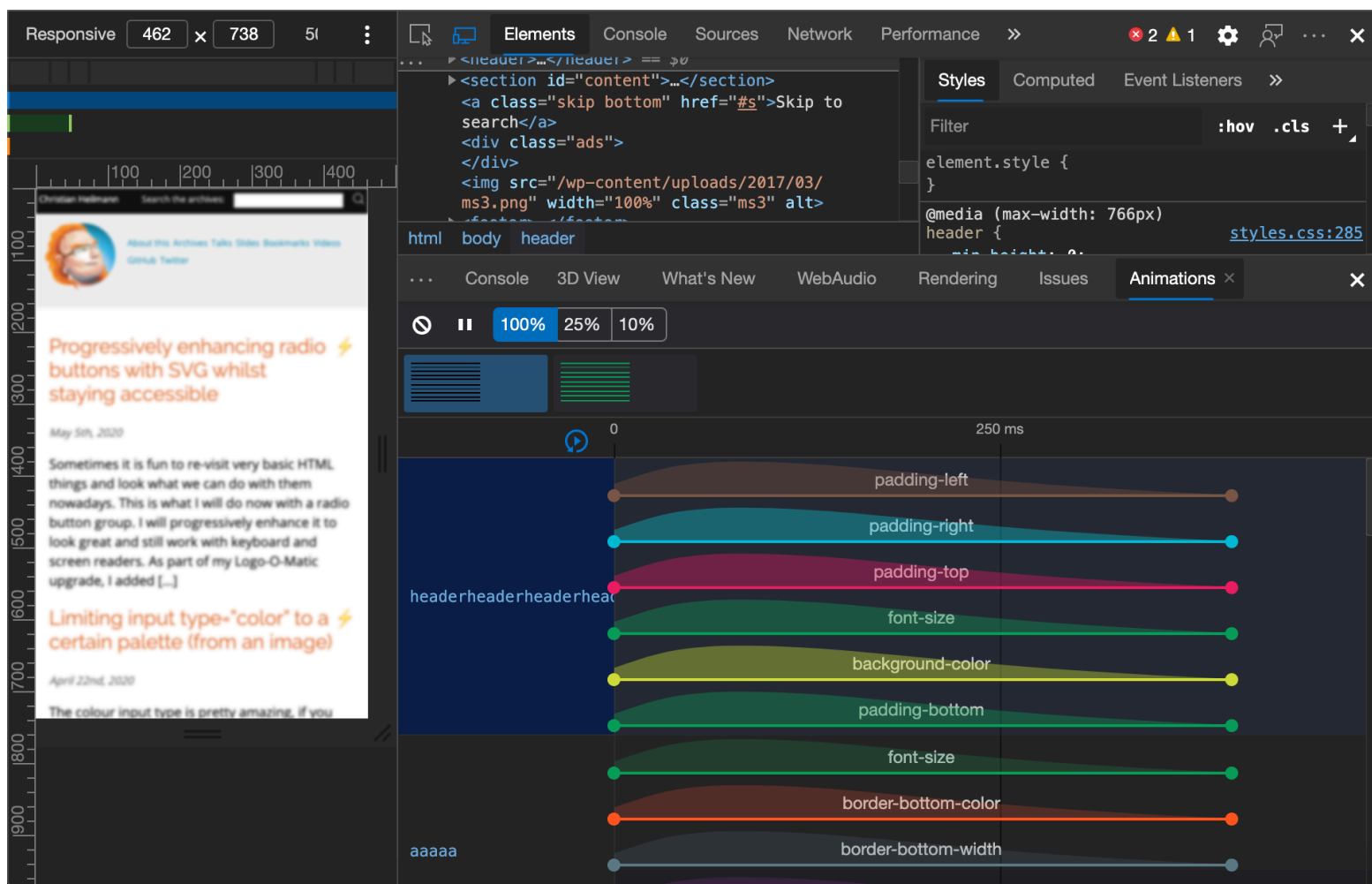
`⌘ ⌘ B` Open breakpoint editor



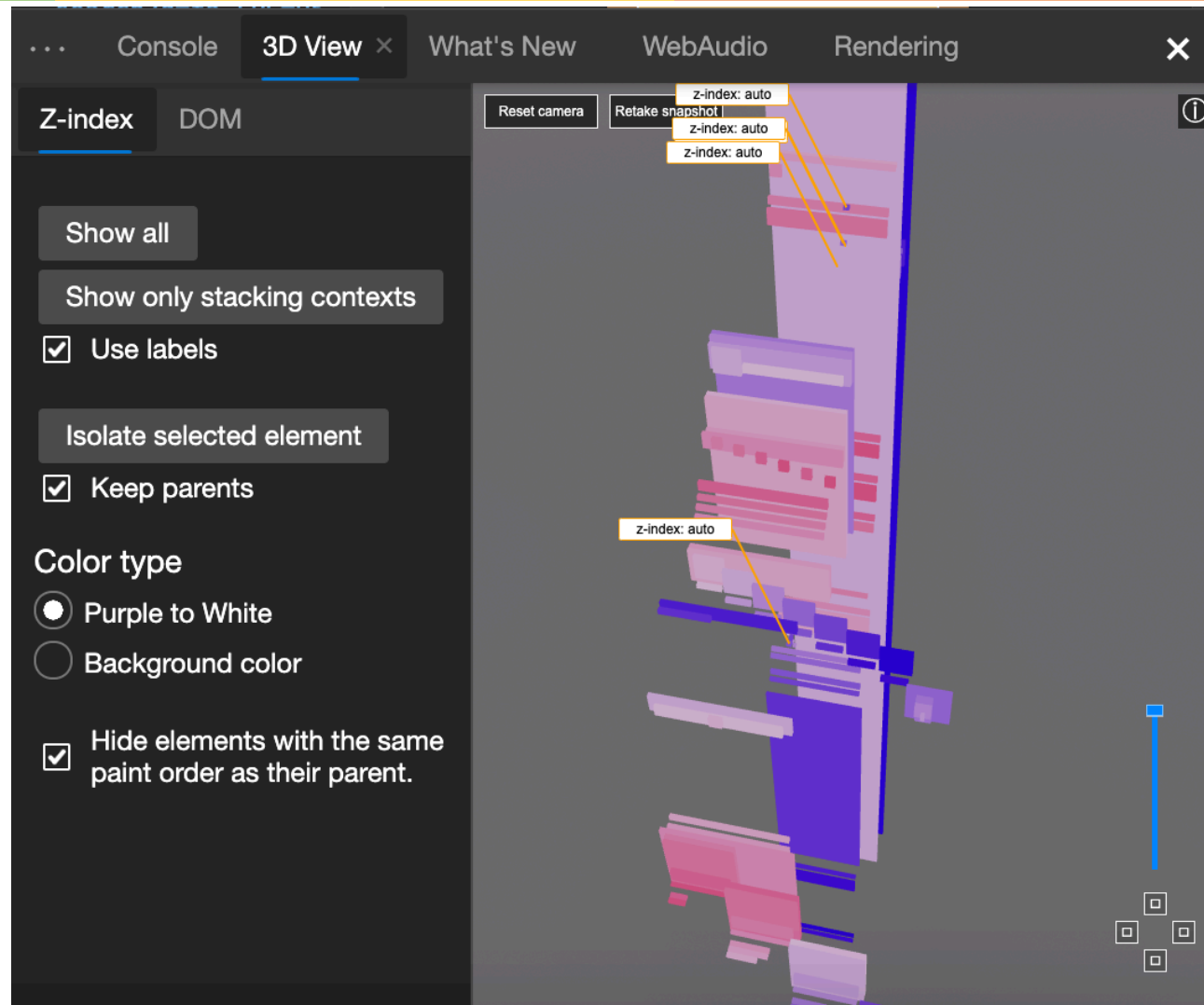
# More visual tooling?



# Animation Editor



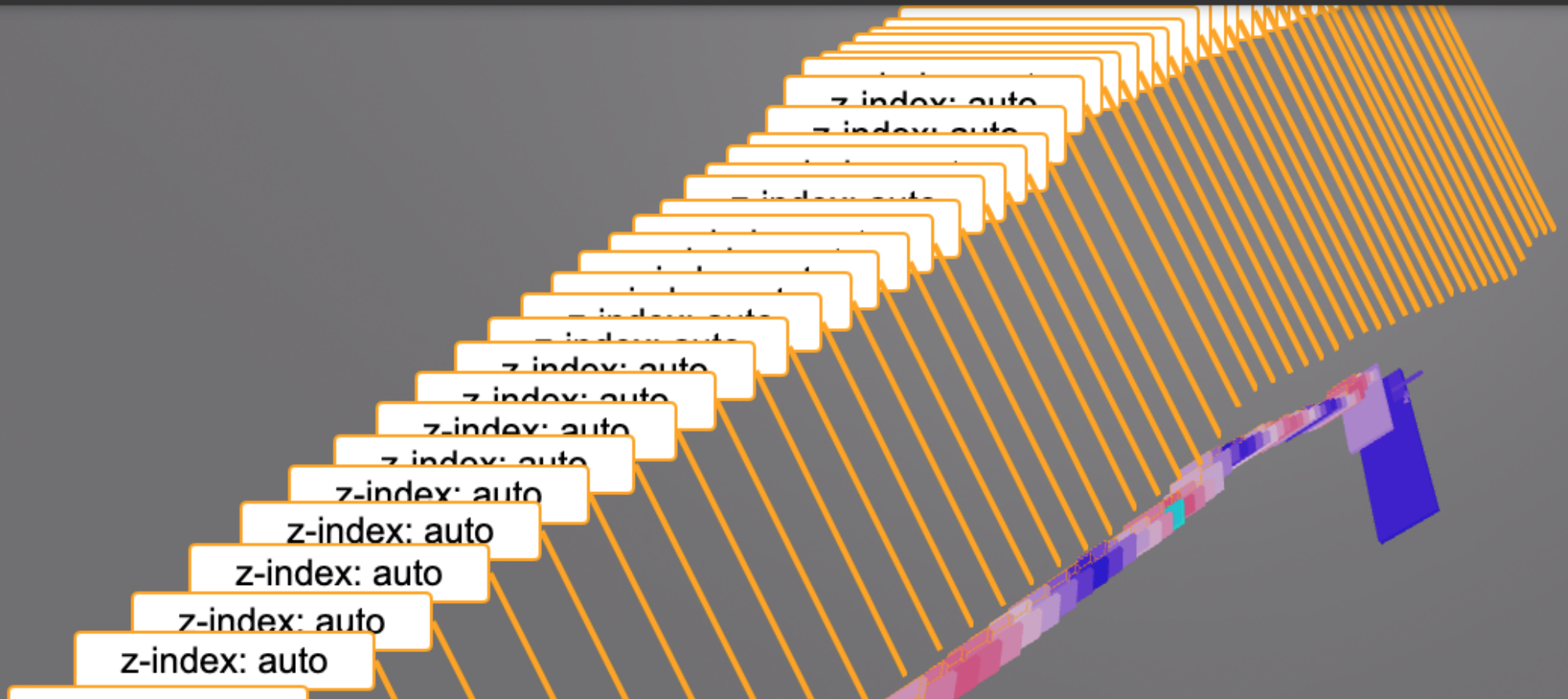
# 3D View



# 3D View

3D View ×

Performance monitor






# Easy to miss extra features...

```
.searchbar {  
  display: flex;  
  color: ■ #fff;  
  background: ▶ ■ #333;  
  border-radius: ▶ 10px;  
  box-shadow: ◻ 0 2px 6px ■ #999;  
}
```

[simples.html:25](#)

```
.searchbar {  
  ✓ display: flex;  
  ✓ color: ■ #fff;  
  ✓ background: ▶ ■ #333;  
  ✓ border-radius: ▶ 10px;  
  ✓ box-shadow: ◻ 0 2px 6px ■ #999;  
}
```

[simples.html:25](#)



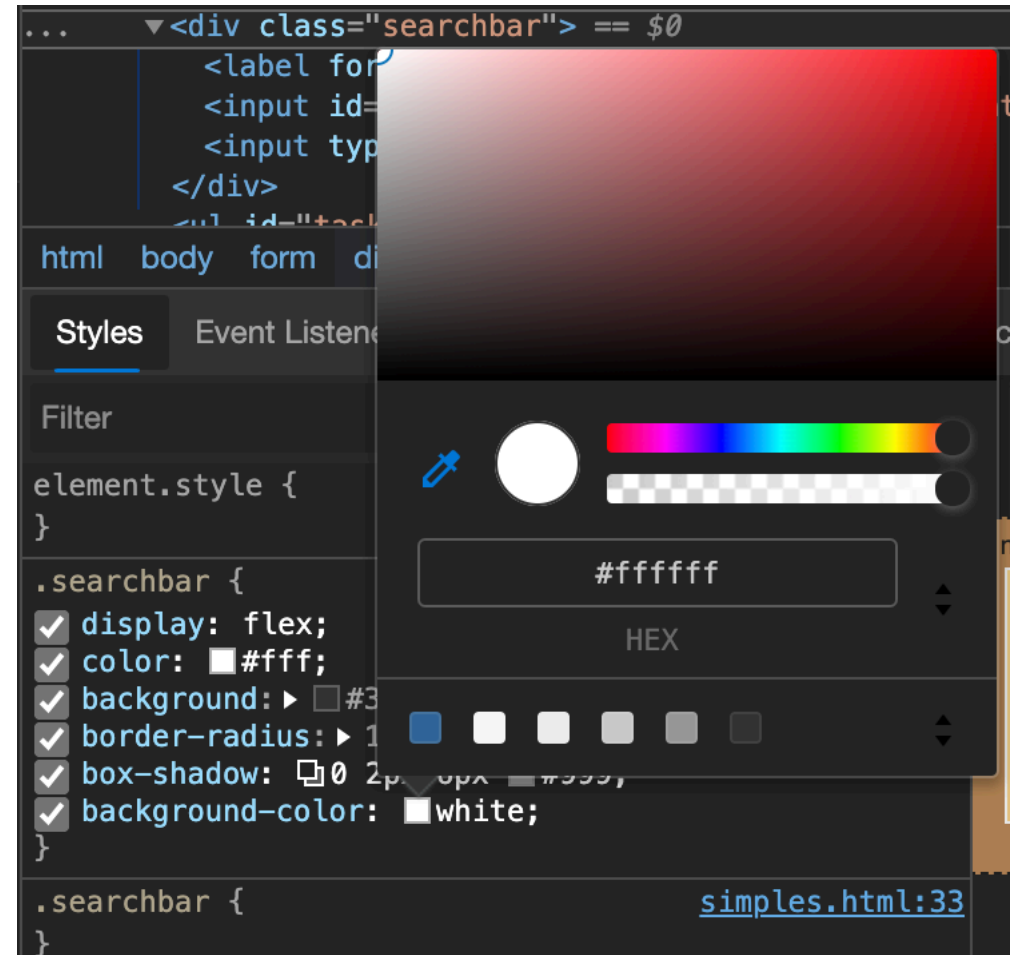
# Colour Picker

```
.searchbar {  
  display: flex;  
  color: ■ #fff;  
  background: ▶ ■ #333;  
  border-radius: ▶ 10px;  
  box-shadow: □ 0 2px 6px ■ #999;  
}
```

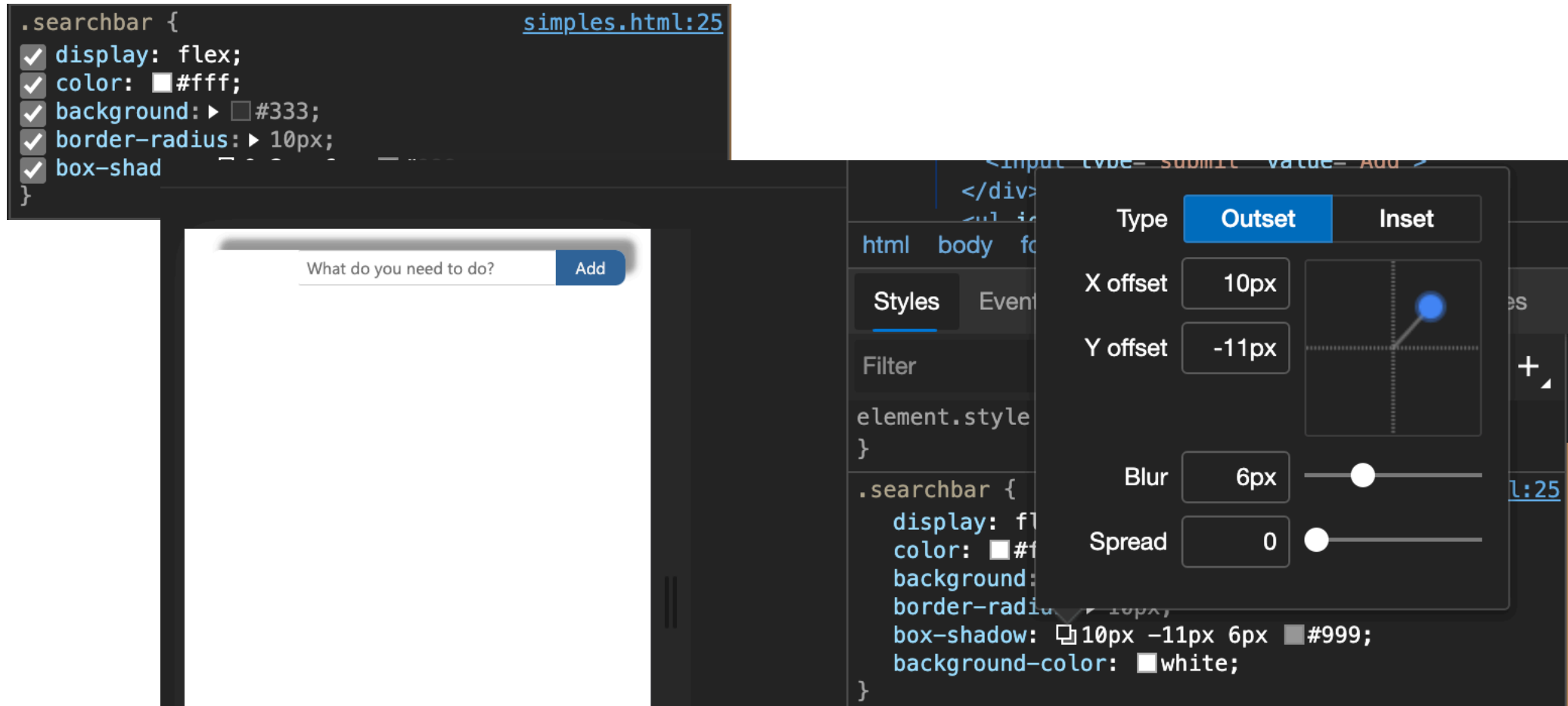
[simples.html:25](#)

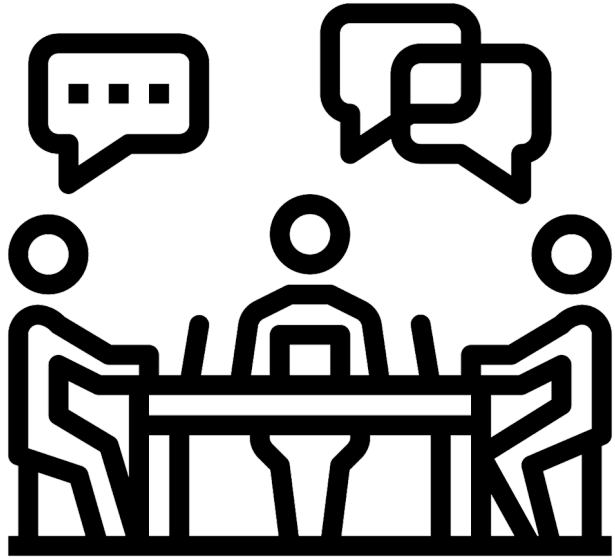
```
.searchbar {  
  ✓ display: flex;  
  ✓ color: ■ #fff;  
  ✓ background: ▶ ■ #333;  
  ✓ border-radius: ▶ 10px;  
  ✓ box-shadow: □ 0 2px 6px ■ #999;  
}
```

[simples.html:25](#)



# Shadow Editor





Currently in  
production:



- CSS Grid tooling
- Font tooling
- Service Worker lifecycle visualization
- ??? (you decide)

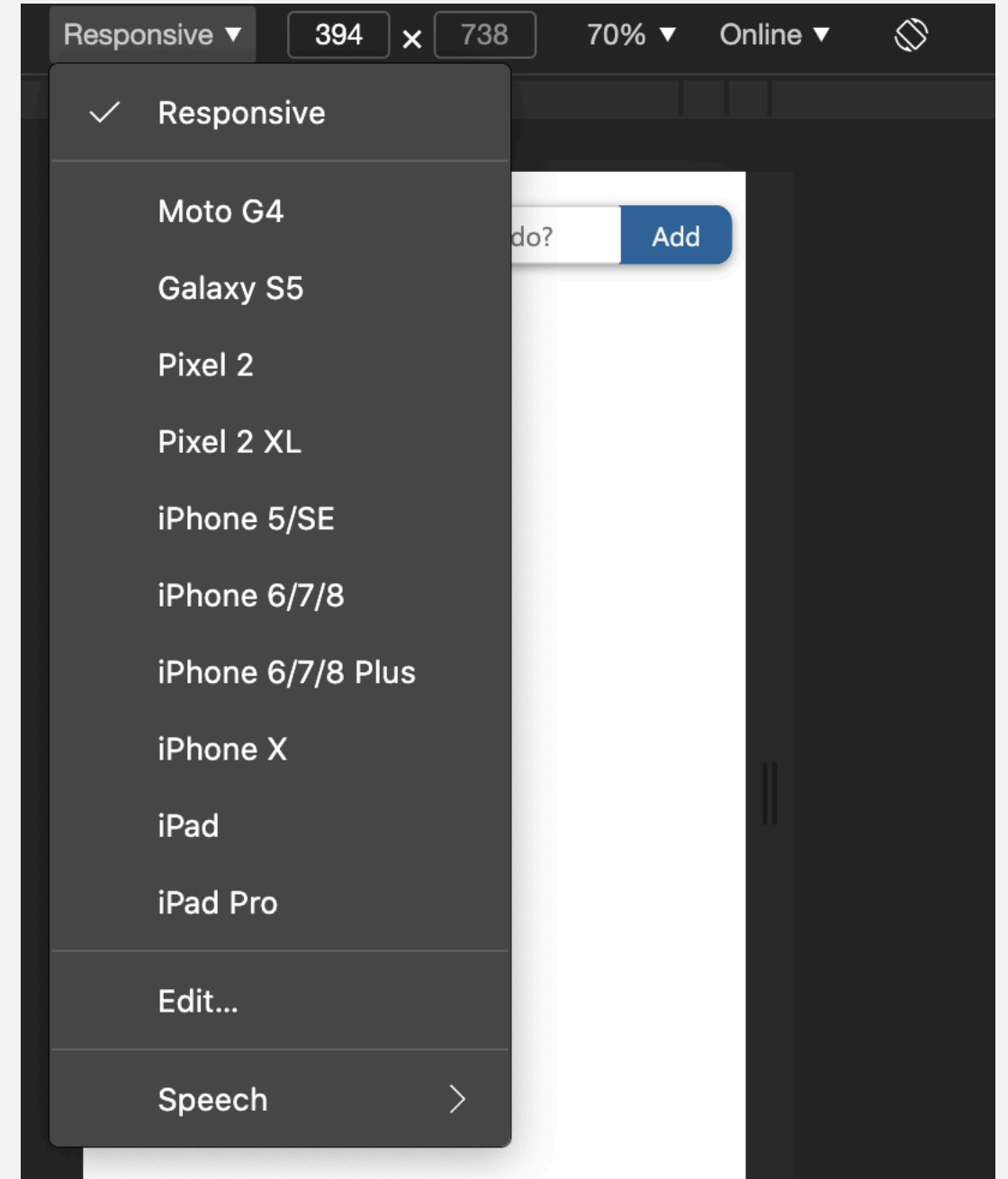


# Emulation



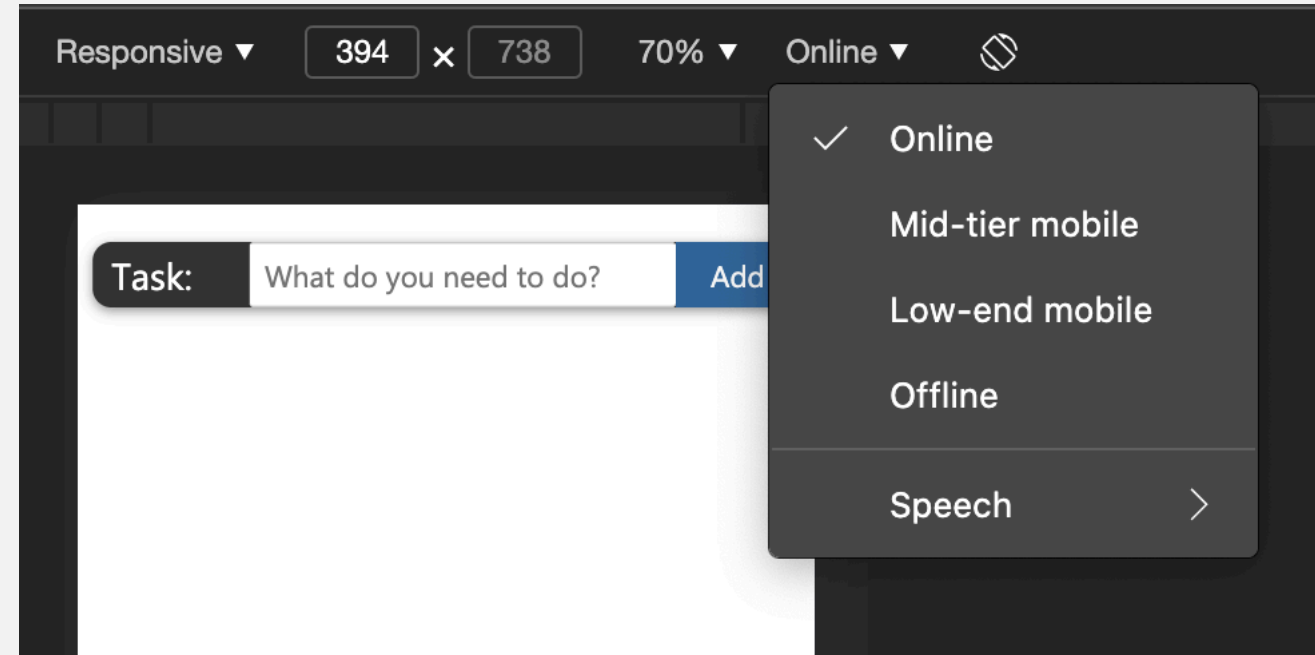


# Device Mode



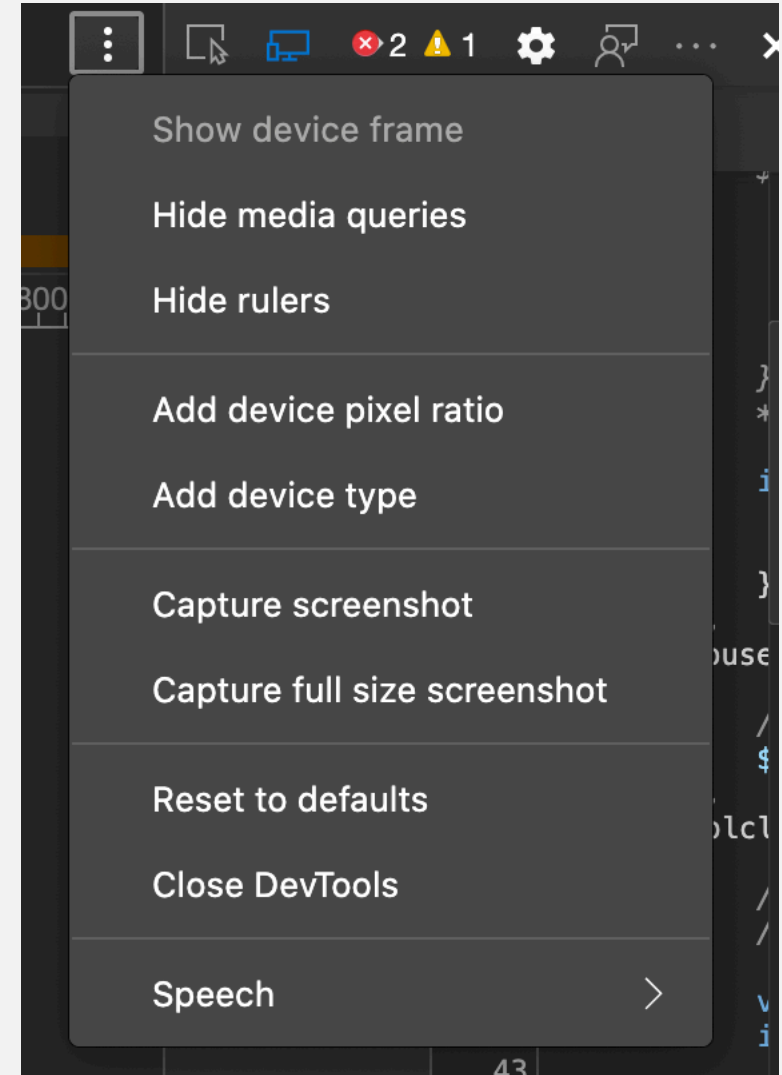


# Device Mode

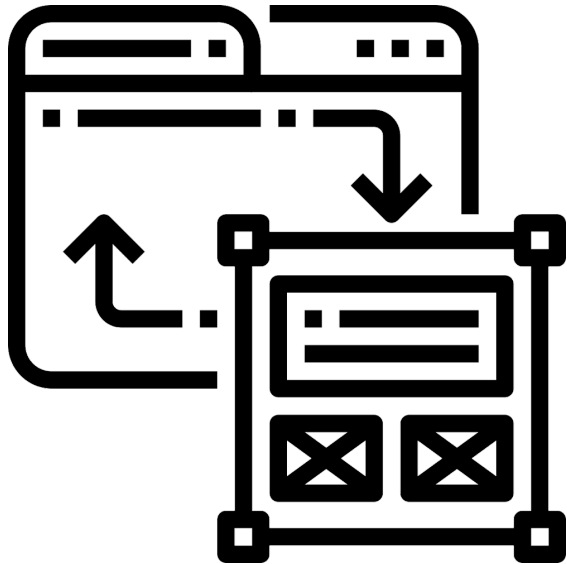




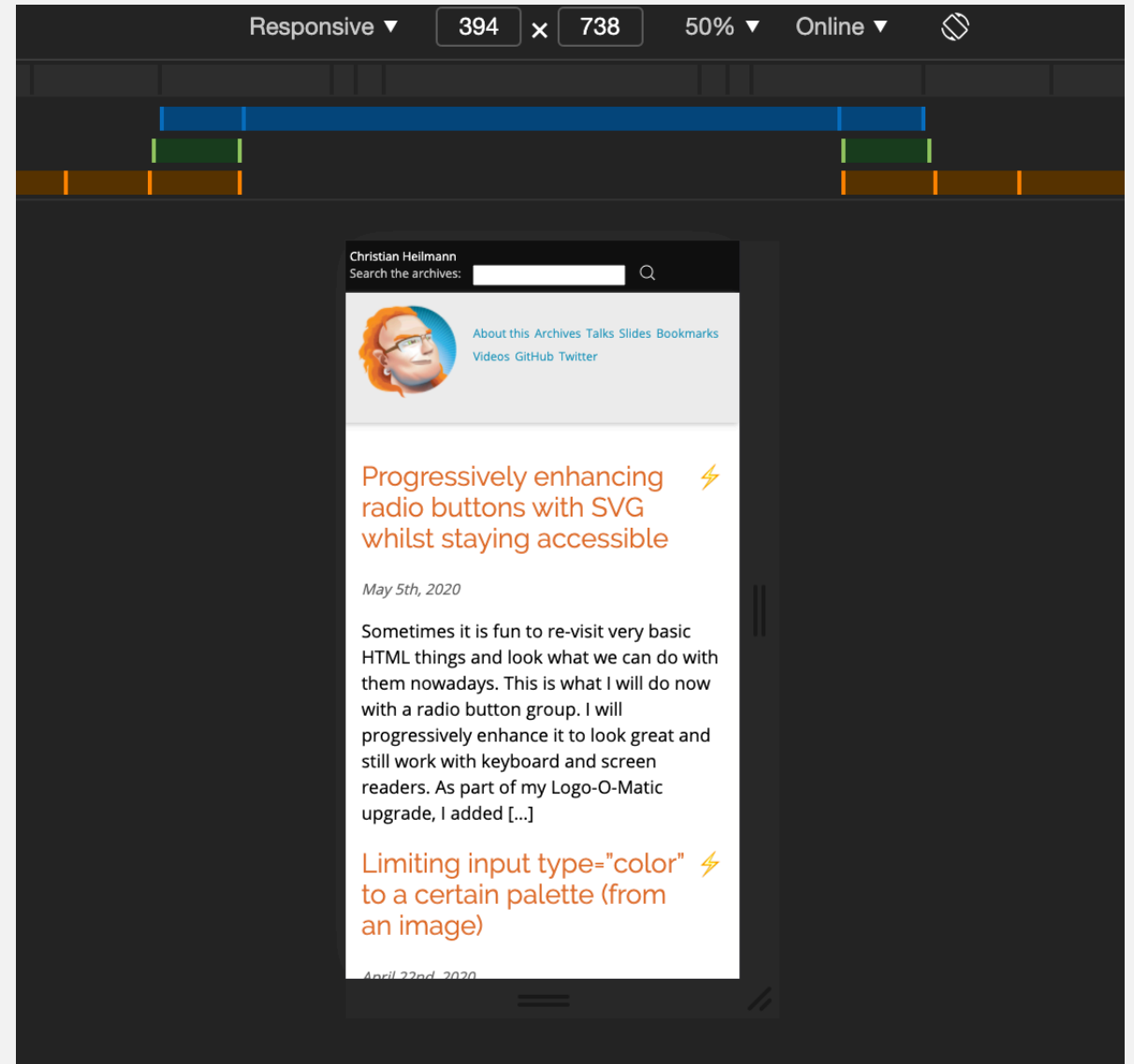
# More features of Device Emulation

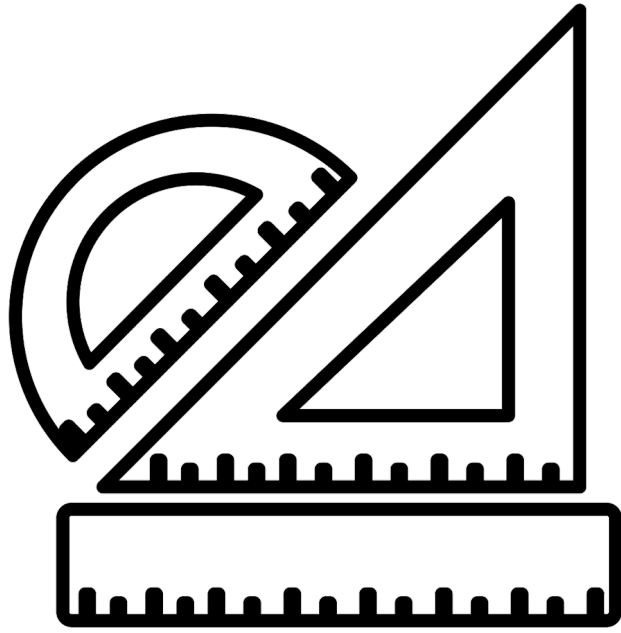




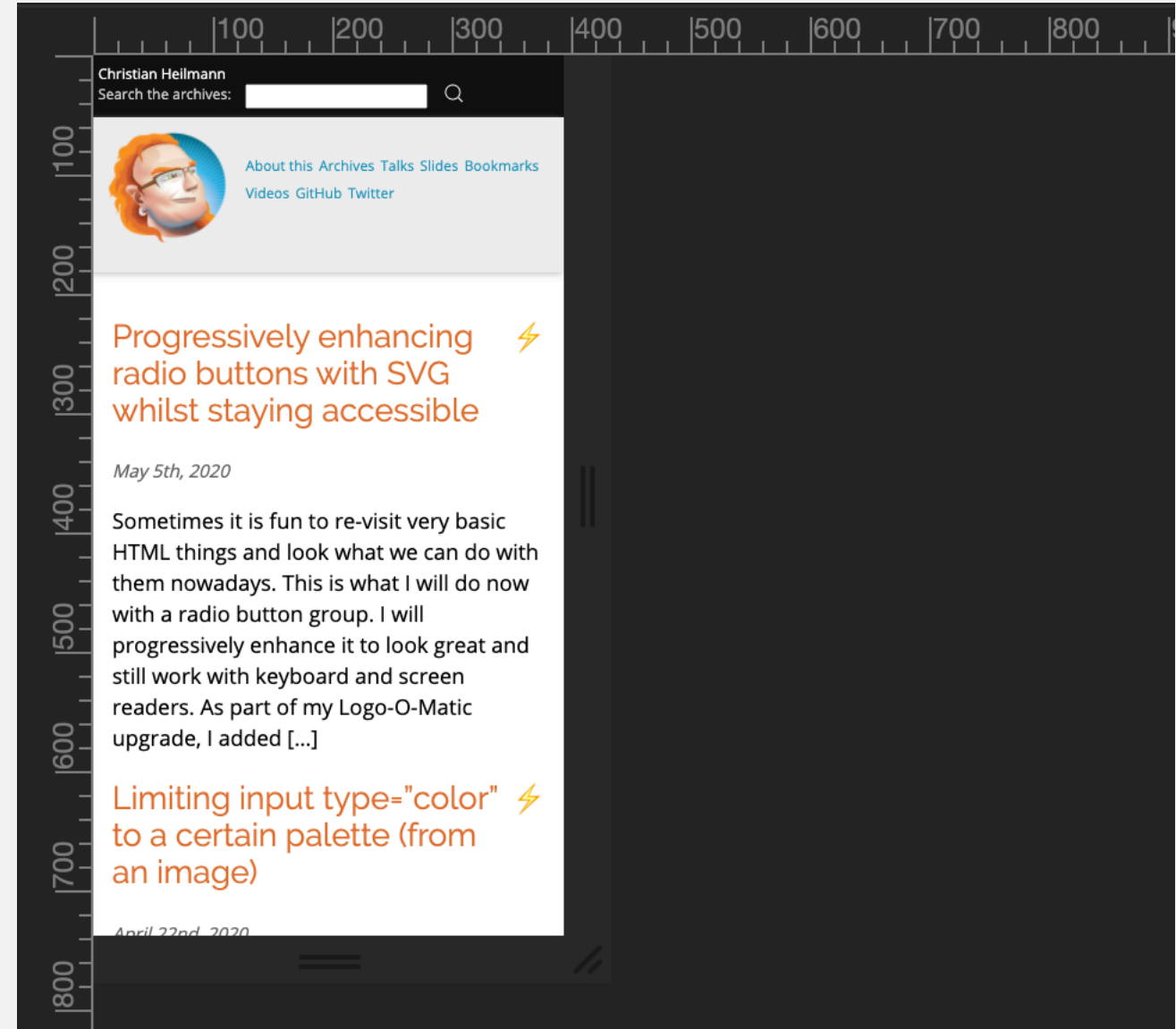


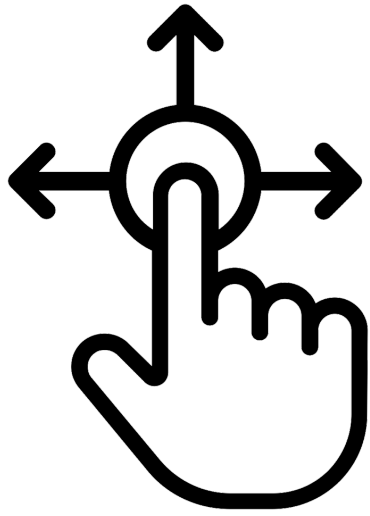
# Media Queries



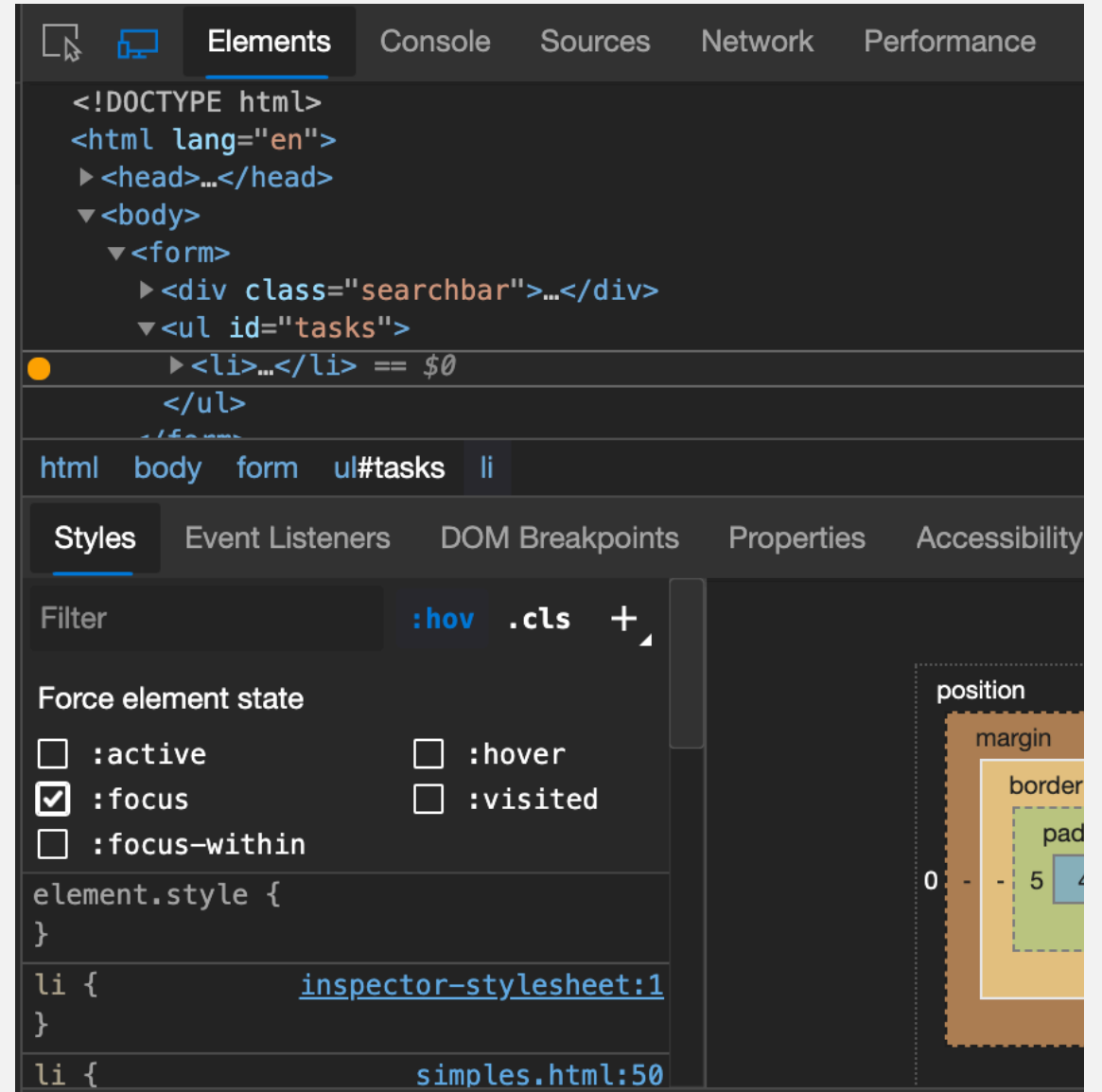


# Screen Ruler





# Interaction emulation



Responsive ▾852 x 73870% ▾Online ▾⛔⋮

Task:What do you need to do?Add

get cookie consent

Elements

<!DOCTYPE html>  
<html lang="en">  
 ><head>...</head>  
 ><body>  
 ><form>  
 ><div class="searchbar">...</div>  
 ><ul id="tasks">

html

Styles

Filter

element

li: hover

back

box-

...

Add attribute

Edit as HTML

Delete element

Copy >

Hide element

Force state >

Break on >

Expand recursively

Collapse children

Scroll into view

Focus

Store as global variable

Speech >

Properties

Accessibility

:active

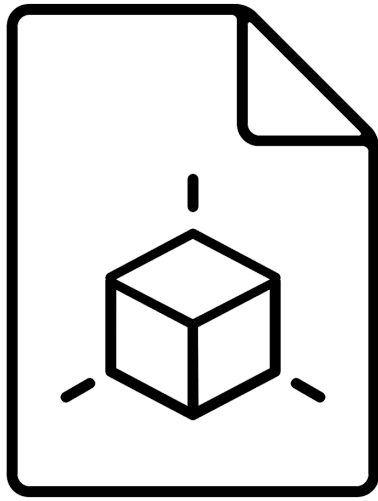
✓:hover

:focus

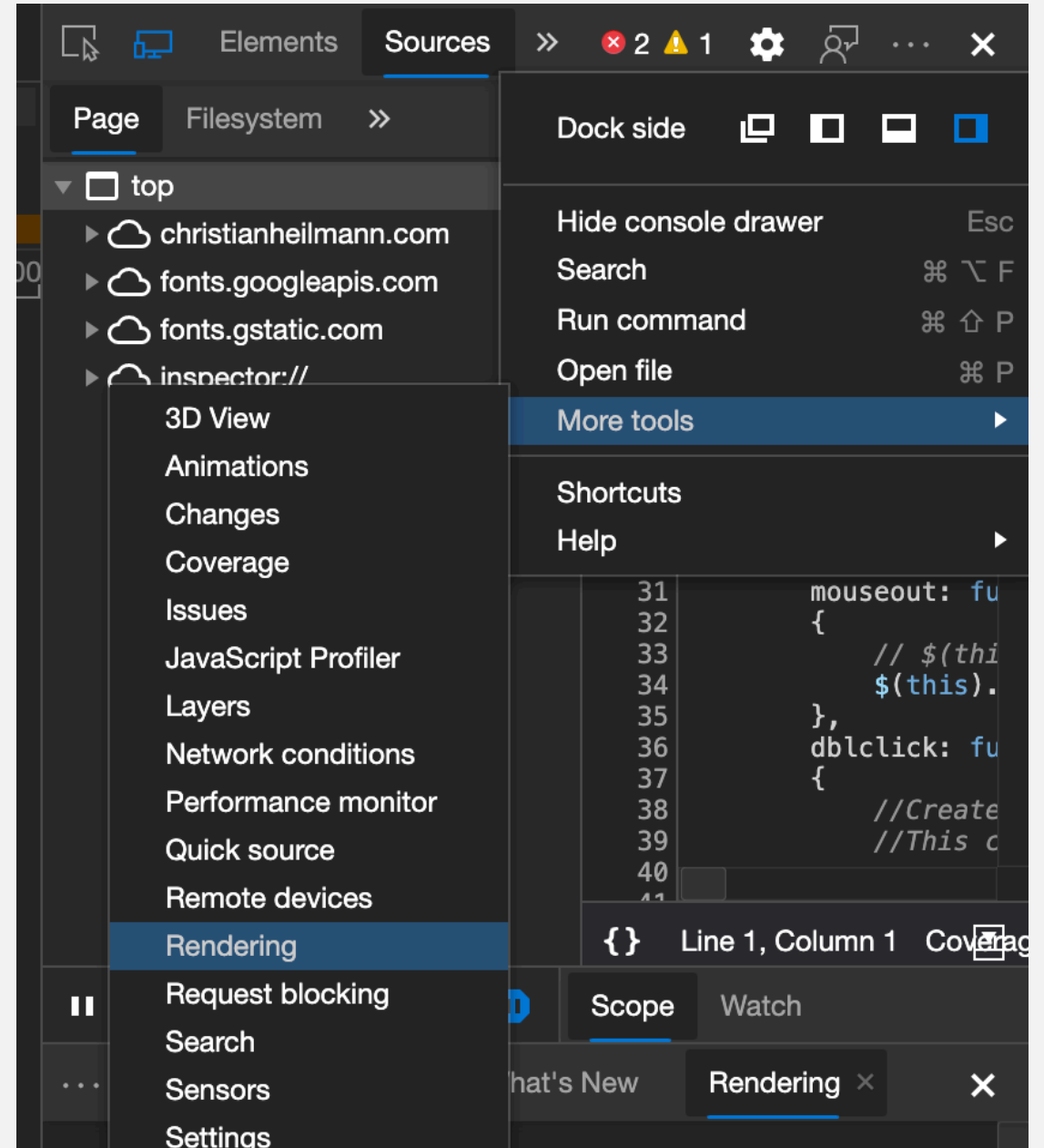
:visited

:focus-within

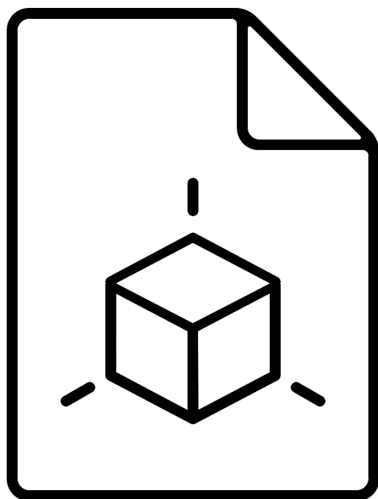
No change



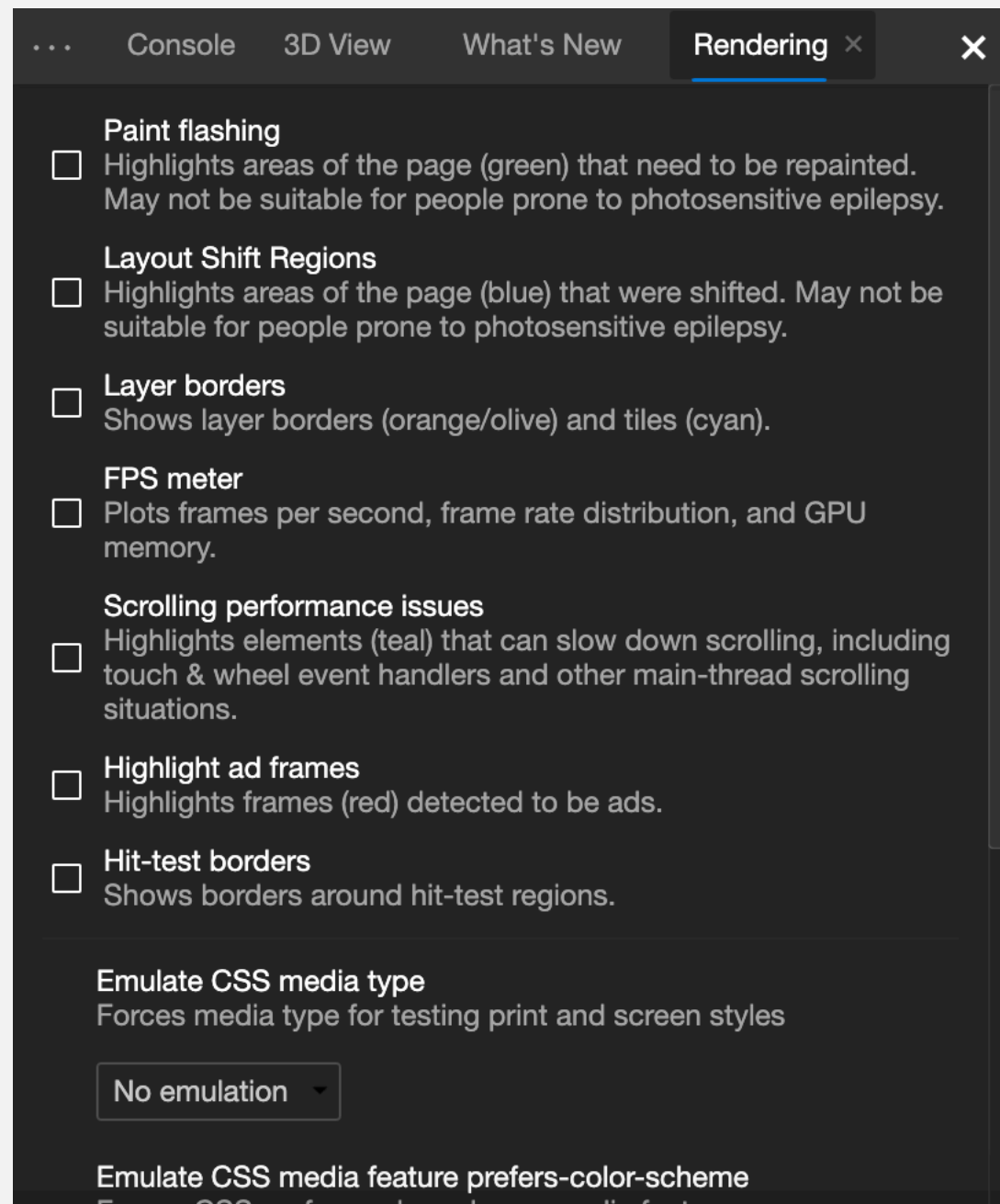
# Rendering menu







# Rendering menu





### Emulate CSS media type

Forces media type for testing print and screen styles

✓ No emulation  
print  
screen

feature prefers-color-scheme

Forces CSS prefers-color-scheme media feature



... Console 3D View What's New **Rendering** ×

☐ **Paint flashing**  
Highlights areas of the page (green) that need to be repainted. May not be suitable for people prone to photosensitive epilepsy.

☐ **Layout Shift Regions**  
Highlights areas of the page (blue) that were shifted. May not be suitable for people prone to photosensitive epilepsy.

☐ **Layer borders**  
Shows layer borders (orange/olive) and tiles (cyan).

☐ **FPS meter**  
Plots frames per second, frame rate distribution, and GPU memory.

☐ **Scrolling performance issues**  
Highlights elements (teal) that can slow down scrolling, including touch & wheel event handlers and other main-thread scrolling situations.

☐ **Highlight ad frames**  
Highlights frames (red) detected to be ads.

☐ **Hit-test borders**  
Shows borders around hit-test regions.

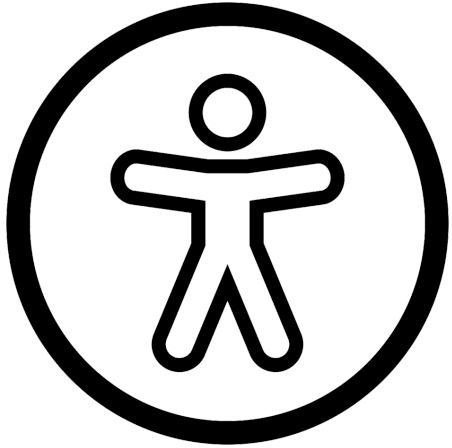
**Emulate CSS media type**  
Forces media type for testing print and screen styles

No emulation ▾

**Emulate CSS media feature prefers-color-scheme**  
Forces CSS prefers-color-scheme media feature

# Accessibility concerns

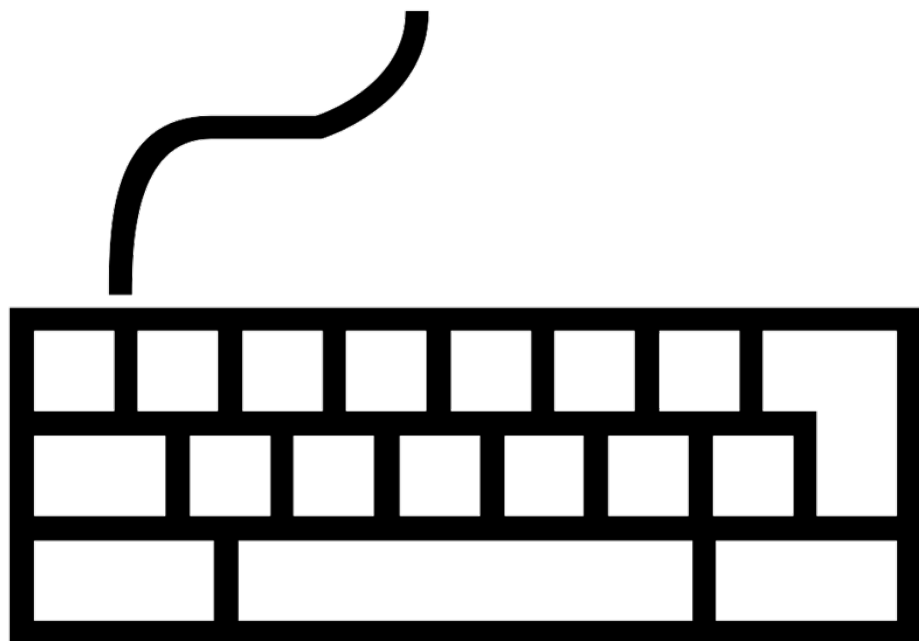




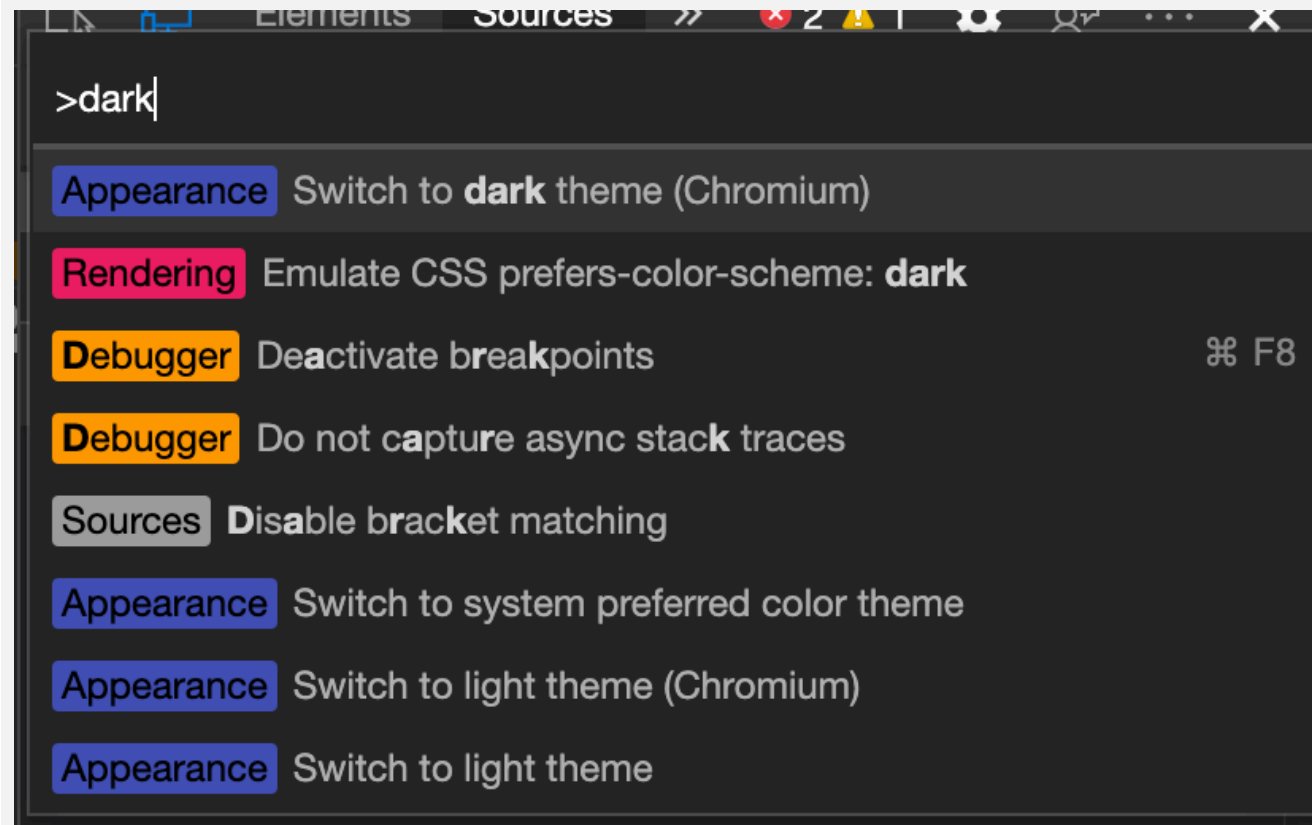
Already shipped:



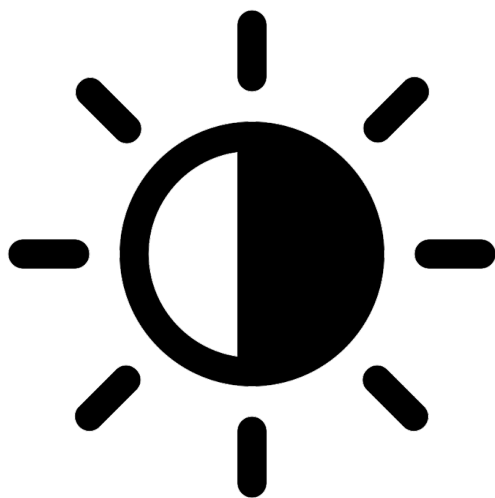
- Developer tools are keyboard and screenreader accessible
- Developer tools work in high contrast mode



Pro tip:  
CMD+SHIFT+P







Emulate CSS media feature prefers-color-scheme  
Forces CSS prefers-color-scheme media feature

✓ No emulation

prefers-color-scheme: light

prefers-color-scheme: dark

-reduced-motion

Forces CSS prefers-reduced-motion media feature



... Console 3D View What's New **Rendering** ×

**Paint flashing**

☐ Highlights areas of the page (green) that need to be repainted. May not be suitable for people prone to photosensitive epilepsy.

**Layout Shift Regions**

☐ Highlights areas of the page (blue) that were shifted. May not be suitable for people prone to photosensitive epilepsy.

**Layer borders**

☐ Shows layer borders (orange/olive) and tiles (cyan).

**FPS meter**

☐ Plots frames per second, frame rate distribution, and GPU memory.

**Scrolling performance issues**

☐ Highlights elements (teal) that can slow down scrolling, including touch & wheel event handlers and other main-thread scrolling situations.

**Highlight ad frames**

☐ Highlights frames (red) detected to be ads.

**Hit-test borders**

☐ Shows borders around hit-test regions.

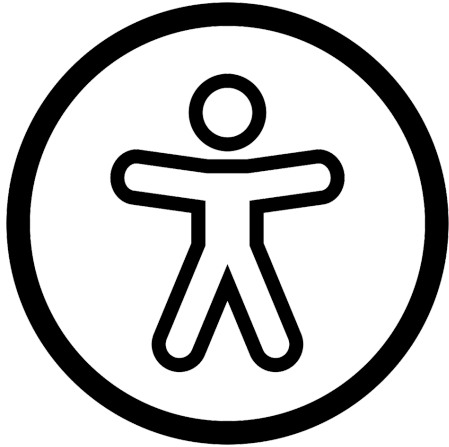
**Emulate CSS media type**

Forces media type for testing print and screen styles

No emulation ▾

**Emulate CSS media feature prefers-color-scheme**

Forces CSS prefers-color-scheme media feature



Emulate CSS media feature prefers-reduced-motion  
Forces CSS prefers-reduced-motion media feature

✓ No emulation  
prefers-reduced-motion: reduce



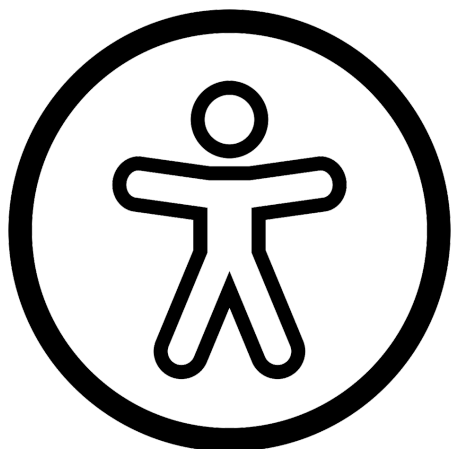
... Console 3D View What's New **Rendering** ×

- ☐ **Paint flashing**  
Highlights areas of the page (green) that need to be repainted. May not be suitable for people prone to photosensitive epilepsy.
- ☐ **Layout Shift Regions**  
Highlights areas of the page (blue) that were shifted. May not be suitable for people prone to photosensitive epilepsy.
- ☐ **Layer borders**  
Shows layer borders (orange/olive) and tiles (cyan).
- ☐ **FPS meter**  
Plots frames per second, frame rate distribution, and GPU memory.
- ☐ **Scrolling performance issues**  
Highlights elements (teal) that can slow down scrolling, including touch & wheel event handlers and other main-thread scrolling situations.
- ☐ **Highlight ad frames**  
Highlights frames (red) detected to be ads.
- ☐ **Hit-test borders**  
Shows borders around hit-test regions.

**Emulate CSS media type**  
Forces media type for testing print and screen styles

No emulation ▾

**Emulate CSS media feature prefers-color-scheme**  
Forces CSS prefers-color-scheme media feature



## Emulate vision deficiencies

Forces vision deficiency emulation

Blurred vision ▾



Responsive 394 x 738 51

Elements Console Sources Network

Page Filesystem >> << >>

christianheilmann.com Line 1, Col 1

Console 3D View What's New WebAudio

- ☐ Scrolling performance issues Highlights elements (teal) that can slow down scrolling thread scrolling situations.
- ☐ Highlight ad frames Highlights frames (red) detected to be ads.
- ☐ Hit-test borders Shows borders around hit-test regions.

Emulate CSS media type Forces media type for testing print and screen styles

No emulation ▾

Emulate CSS media feature prefers-color-scheme Forces CSS prefers-color-scheme media feature

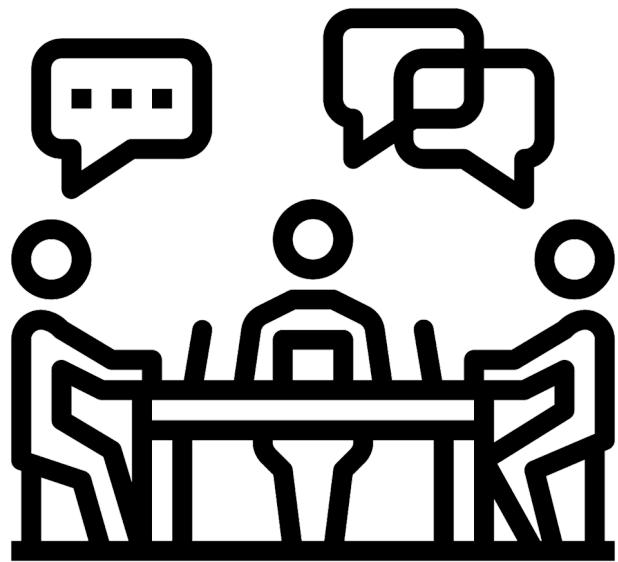
No emulation ▾

Emulate CSS media feature prefers-reduced-motion Forces CSS prefers-reduced-motion media feature

No emulation  
✓ Blurred vision  
Protanopia  
Deuteranopia  
Tritanopia  
Achromatopsia

Blurred vision ▾

Emulate vision deficiencies Forces vision deficiency emulation



Currently in  
production:




- High Contrast simulation
- Simpler accessible interfaces
- Accessibility error reporting in context
- Dual Screen Emulation



Wikipedia, the free encyclopedia

← → ↻ 🔒 https://en.wikipedia.org/wiki/Main\_Page

Wikipedia Weekend Weather



Not logged in

Talk

Contributions

Create account

Log in

Main PageTalk

ReadView sourceView history

Welcome to Wikipedia,  
the free encyclopedia that anyone can edit.  
6,072,955 articles in English

Arts

Biography

Geography

History

Mathematics

Science

Society

Technology

All portals

Main page

Contents

Featured content

Current events

Random article

Donate to Wikipedia

Wikipedia store

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Upload file

Special pages

Permanent link

Page information

Wikidata item

In other projects

Wikimedia Commons

MediaWiki

Meta-Wiki

Wikispecies

Wikibooks

Wikidata

Wikimania


Wikinews

Wikiquote

Wikisource

Wikiversity

From today's featured article



Vergina Sun, an emblem of Macedonia

**Macedonia** was an ancient kingdom on the periphery of Archaic and Classical Greece, and later the dominant state of Hellenistic Greece. The kingdom was founded and initially ruled by the Argead dynasty, followed by the Antipatrid and Antigonid dynasties. Home to the ancient Macedonians, it originated on the northeastern part of the Greek peninsula. Before the 4th century BC, it was a small kingdom outside of the area dominated by the city-states of Athens, Sparta and Thebes, and briefly subordinate to Achaemenid Persia. During the reign of the Argead king Philip II (359–336 BC), Macedonia subdued mainland Greece and the Thracians' Odrysian kingdom through conquest and diplomacy, and defeated Athens and Thebes in the Battle of Chaeronea. His son Alexander the Great, commanding the whole of Greece, destroyed Thebes after the city revolted. During Alexander's subsequent campaign of conquest, he overthrew the Achaemenid Empire and conquered as far as the Indus River. **(Full article...)**


Recently featured: *Unknown* (magazine) · *God of War: Ascension* · *Lactarius torminosus*

In the news

**COVID-19 pandemic**

Disease · Virus · Testing · Timeline (May) · By location · Impact · Deaths · Portal

In the Philippines, the leading television network ABS-CBN



ABS-CBN Broadcasting Center

(headquarters pictured) is **ordered to cease and desist** by the National Telecommunications Commission.

Canada **bans** the sale of assault-style firearms after **a mass killing** in Nova Scotia leaves twenty-two victims dead.

After seventeen months of stalemate, the Likud and Blue and White parties reach **an agreement** for Benjamin Netanyahu and Benny Gantz to share power in Israel.

Recent deaths:

Florian Schneider · Millie Small · Eugene Kostyra · Dave Greenfield · Jim Cross · Idir

**Other recent events · Nominate an article**

Elements

ConsoleSourcesNetworkPerformanceMemoryApplicationSecurityAudits

color:#000;">

<h2 id="mp-tfa-h2" style="margin:0.5em; background:#cef2e0; font-family:inherit; font-size:120%; font-weight:bold; border:1px solid #a3bfb1; color:#000; padding:0.2em 0.4em;">

<span id="From\_today.27s\_featured\_article"></span>

<span class="mw-headline" id="From\_today's\_featured\_article">From today's featured article</span> == \$0

</h2>

><div id="mp-tfa" style="padding:0.1em 0.6em; "></div>

><h2 id="mp-dyk-h2" style="clear:both; margin:0.5em; background:#cef2e0; font-family:inherit; font-size:120%; font-weight:bold; border:1px solid #a3bfb1; color:#000; padding:0.2em 0.4em;"></h2>

#mp-tfa-h2 span#From\_today's\_featured\_article.mw-headline

Styles

ComputedEvent Listeners

Filter: :hov .cls

element.style { }

Inherited from h2#mp-tfa-h2

Style Attribute { margin: 0.5em; background: #cef2e0; font-family: inherit; font-size: 120%; font-weight: bold; border: 1px solid #a3bfb1; color: #000; padding: 0.2em 0.4em; }

.mw-body-content h2 { margin-top: 1em; }

ConsoleRendering

Scrolling performance issues

☐ Highlights elements (teal) that can slow down scrolling, including touch & wheel event handlers and other main-thread scrolling situations.

☐ Highlight ad frames

Highlights frames (red) detected to be ads.

☐ Hit-test borders

Shows borders around hit-test regions.

Emulate CSS media type

Forces media type for testing print and screen styles

No emulation

Emulate CSS media feature prefers-color-scheme

Forces CSS prefers-color-scheme media feature

No emulation

Emulate CSS media feature prefers-reduced-motion

Forces CSS prefers-reduced-motion media feature

No emulation

Emulate CSS media feature forced-colors

Forces CSS forced-colors media feature

forced-colors: active



# Need for speed?



Activity Monitor

FileEditViewWindowHelp

Activity Monitor (My Processes)

CPU

Memory

Energy

Disk

Network

Search

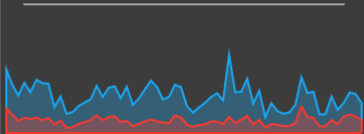
Process Name	% CPU	CPU Time	Threads	Idle Wake-Ups	% GPU	GPU Time	PID	User
Activity Monitor	12,1	5:45:44,90	6	4	0,0	0,00	416	chrisheilmann
Microsoft PowerPoint	3,7	32:24,81	48	68	0,4	4:16,85	43688	chrisheilmann
Microsoft Edge	3,5	45:51,27	85	5	0,0	0,00	43787	chrisheilmann
Microsoft Teams Helper	3,3	11:54,70	14	179	0,0	0,00	66127	chrisheilmann
Firefox	3,2	6:30:21,10	81	27	0,0	42:09,12	900	chrisheilmann
Microsoft Teams	3,2	13:26,26	40	188	0,0	0,00	66079	chrisheilmann
FirefoxCP Web Content	3,1	3:56:41,37	37	97	0,0	0,00	1106	chrisheilmann
FirefoxCP Web Content	2,2	2:52:56,53	37	24	0,0	0,00	1103	chrisheilmann
iconservicesagent	2,1	1:29,30	5	0	0,0	0,41	370	chrisheilmann
Microsoft Edge	1,8	44:27,67	80	35	0,0	0,00	44060	chrisheilmann
Code Helper (GPU)	1,7	30:15,42	8	12	0,0	6:01,97	56760	chrisheilmann
Electron Helper (Renderer)	1,5	20:33,80	22	15	0,0	0,00	56763	chrisheilmann
Microsoft Outlook	1,1	54:55,94	28	12	0,0	3,90	44503	chrisheilmann
FirefoxCP Web Content	0,8	5:41,07	28	21	0,0	0,00	60390	chrisheilmann
FirefoxCP Web Content	0,7	11:32,43	35	16	0,0	0,00	52567	chrisheilmann
Hemingway Editor	0,6	7:58,25	30	0	0,0	0,00	410	chrisheilmann
DashlaneAgent	0,5	13:20,85	9	17	0,0	0,00	42804	chrisheilmann
Microsoft OneNote	0,5	28:05,53	66	13	0,0	0,00	5461	chrisheilmann
DashlanePluginService	0,4	11:53,77	9	17	0,0	0,00	42805	chrisheilmann
Microsoft Edge Helper	0,4	16:44,42	11	4	0,0	0,00	44069	chrisheilmann
Dropbox	0,4	21:06,45	141	13	0,0	0,00	13070	chrisheilmann
Microsoft Edge Helper (Renderer)	0,4	25:51,26	20	2	0,0	0,00	44938	chrisheilmann
AXVisualSupportAgent	0,3	13:53,72	5	10	0,0	0,00	340	chrisheilmann
FirefoxCP Web Content	0,2	6:16,82	27	4	0,0	0,00	62134	chrisheilmann
sharedfilelistd	0,2	9,59	3	0	0,0	0,00	351	chrisheilmann
Microsoft Edge Helper (Renderer)	0,2	6:00,94	17	10	0,0	0,00	44073	chrisheilmann
FirefoxCP WebExtensions	0,2	23:53,72	28	2	0,0	0,00	914	chrisheilmann
Code	0,2	7:51,25	29	2	0,0	0,00	56759	chrisheilmann

System:11,94 %

User:15,06 %

Idle:73,00 %

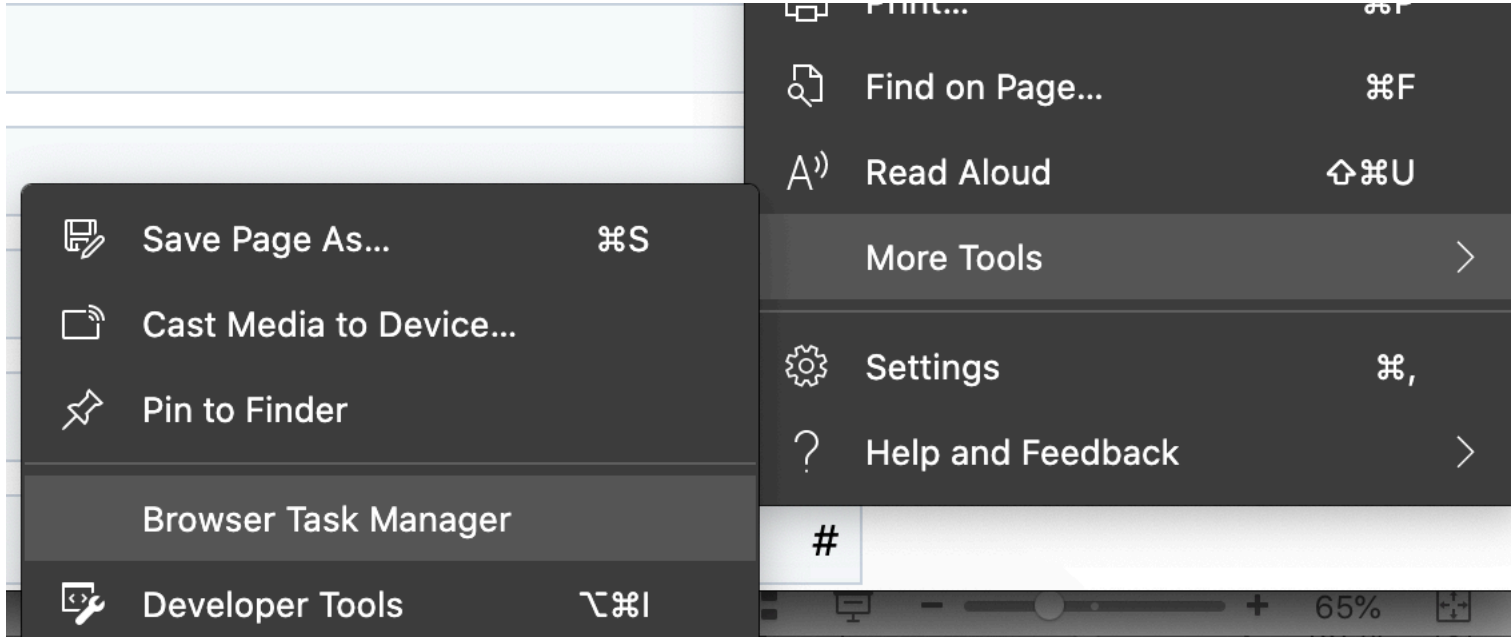
CPU LOAD



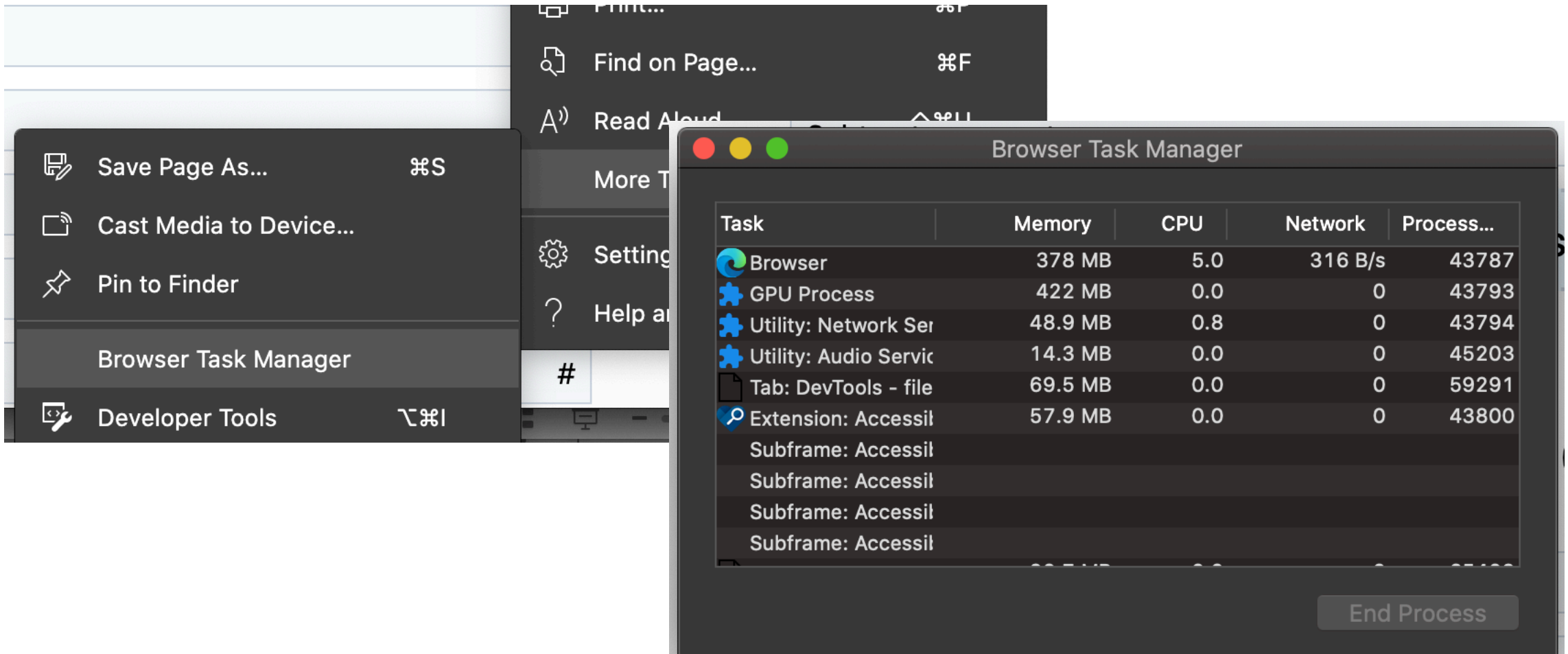
Threads:4.325

Processes:600

# Browser task manager!



# Where did my resources go?

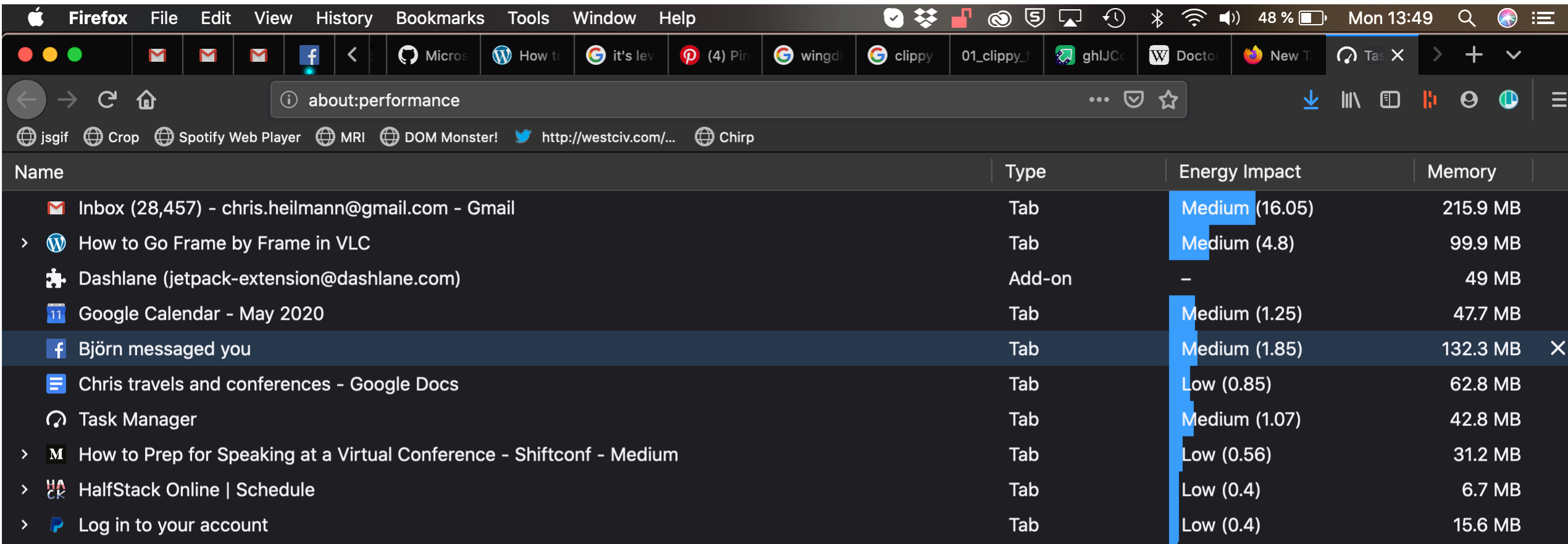


The screenshot shows a web browser interface with a 'Browser Task Manager' window open. The window displays a table of tasks and their resource usage. The tasks listed are:

Task	Memory	CPU	Network	Process...
Browser	378 MB	5.0	316 B/s	43787
GPU Process	422 MB	0.0	0	43793
Utility: Network Ser	48.9 MB	0.8	0	43794
Utility: Audio Servic	14.3 MB	0.0	0	45203
Tab: DevTools - file	69.5 MB	0.0	0	59291
Extension: Accessil	57.9 MB	0.0	0	43800
Subframe: Accessil				
Subframe: Accessil				
Subframe: Accessil				
Subframe: Accessil				

An 'End Process' button is visible at the bottom right of the window.

# Hat tip: also in Firefox!

A screenshot of the Firefox browser's 'about:performance' page. The browser's address bar shows 'about:performance'. The page displays a table of running tabs and add-ons, including their names, types, energy impact, and memory usage. The 'Energy Impact' column is highlighted with a blue background. The table lists various tabs like 'Inbox (28,457) - chris.heilmann@gmail.com - Gmail' and 'How to Go Frame by Frame in VLC', as well as an add-on 'Dashlane'. The 'Energy Impact' values range from 'Low (0.4)' to 'Medium (1.85)'. The 'Memory' usage ranges from '15.6 MB' to '215.9 MB'.

Name	Type	Energy Impact	Memory
Inbox (28,457) - chris.heilmann@gmail.com - Gmail	Tab	Medium (16.05)	215.9 MB
>  How to Go Frame by Frame in VLC	Tab	Medium (4.8)	99.9 MB
Dashlane (jetpack-extension@dashlane.com)	Add-on	-	49 MB
Google Calendar - May 2020	Tab	Medium (1.25)	47.7 MB
Björn messaged you	Tab	Medium (1.85)	132.3 MB
Chris travels and conferences - Google Docs	Tab	Low (0.85)	62.8 MB
Task Manager	Tab	Medium (1.07)	42.8 MB
>  How to Prep for Speaking at a Virtual Conference - Shiftconf - Medium	Tab	Low (0.56)	31.2 MB
>  HalfStack Online   Schedule	Tab	Low (0.4)	6.7 MB
>  Log in to your account	Tab	Low (0.4)	15.6 MB

# How the sausage is made...





# Innovation in the open...



## Microsoft Edge Explainers

<https://github.com/MicrosoftEdge/MSEdgeExplainers>

Welcome! This repo is home to "explainers" and related documents originating from the Microsoft Edge team.

Jump to section: [Active Explainers](#) | [Alumni](#) | [DevTools](#) | [Other documents](#) | [Withdrawn](#)

## Introduction

[Explainers](#) are documents focused on describing a user/ developer/ customer problem (at a high level) and exploring potential solutions. These documents are starting points for engaging in discussion with you and other members of the community. Explainers should address their stated problems in clear and easy to understand language. Proposed solutions should be easy to follow and not too deep in technical details. When you read an explainer, we hope the stated problem is compelling and you can form an opinion for whether the proposed solution would address the problem.

## Please provide feedback

We are looking for feedback! Are the stated problems relevant to you? How have they impacted your experience? Do the proposed solutions seem reasonable? Do they follow good [web principles](#)? Would they solve a problem you currently have? (We love to hear that; tell us more about your scenario!) Do you have related use-cases we hadn't considered?

# Detailed developer tools explainers

## DevTools

---

We love our developer tools! Checkout these cool innovations being designed for the developer tools:

- [3D View](#)
- [CSS Grid Tooling](#)
- [Customizable Keyboard Shortcuts](#)
- [Dual-screen Emulation](#)
- [High Contrast Simulation](#)
- [Infobar UI Refresh](#)
- [Localization](#)
- [Redux for State](#)
- [Service Worker Improvements](#)
- [Settings Discoverability and Telemetry](#)
- [Settings Search](#)
- [Stackable Overlays](#)
- [webhint](#)

<https://github.com/MicrosoftEdge/MSEdgeExplainers>

# Discussion amongst browser makers

3D View for DevTools

File Edit View Insert Format Tools Add-ons Help

See new changes

Share

100%

Normal text

Arial

11

B I U A

Link

Image

List

Table

Quote

Code

Fullscreen

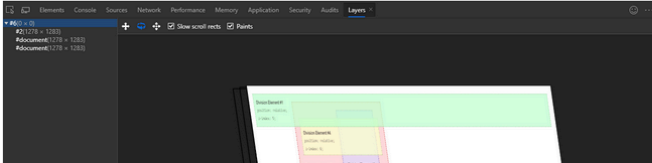
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19

## Core user stories

- A developer can debug z-index by isolating an element from the webpage and following its stacking context hierarchy.
- A developer can find areas of the document that have deep DOM nesting.
- A developer can select a DOM element faster by clicking a box in the 3D View than by expanding the Elements xml tree.

The Layers panel has a different purpose than the proposed z-index view. It shows composition layers and its useful to debug repaints, in the screenshot below we can see the same webpage used on the example 1 for the z-index view in page 2.

This shows that all the elements were placed inside the same composition layer even when all of them have a different stacking context.



Yang Guo

5 Nov 2019

Resolve

What overlap does this feature have with the layers view? Could these two features be merged?

Show all 5 replies

Benedikt Meurer

10 Nov 2019

Resolve

I'm also still very much concerned that this will be yet another different thing to worry about for developers. Can we

Show more

Benedikt Meurer

Resolve

# Others join, too!

WebKit / explainers

Watch 54 Star 148 Fork 7

Code Issues 14 Pull requests 0 Actions Security 0 Insights

Explainers from WebKit contributors

21 commits 1 branch 0 packages 0 releases 4 contributors

Branch: master New pull request Create new file Upload files Find file Clone or download

**hober** Separate section for proposals which ahve graduated. Latest commit 90b55cd on 3 Apr

.github/ISSUE_TEMPLATE	Remove issue template for the SMS explainer, which moved to WICG.	last month
IsLoggedIn	Add the IsLoggedIn explainer. (#31)	2 months ago
sms-one-time-code-format	sms-one-time-code-format has moved to WICG.	last month
texttracks	Add Makefiles for easier explainer updating.	3 months ago
.gitignore	Add .gitignore	4 months ago
README.md	Separate section for proposals which ahve graduated.	last month

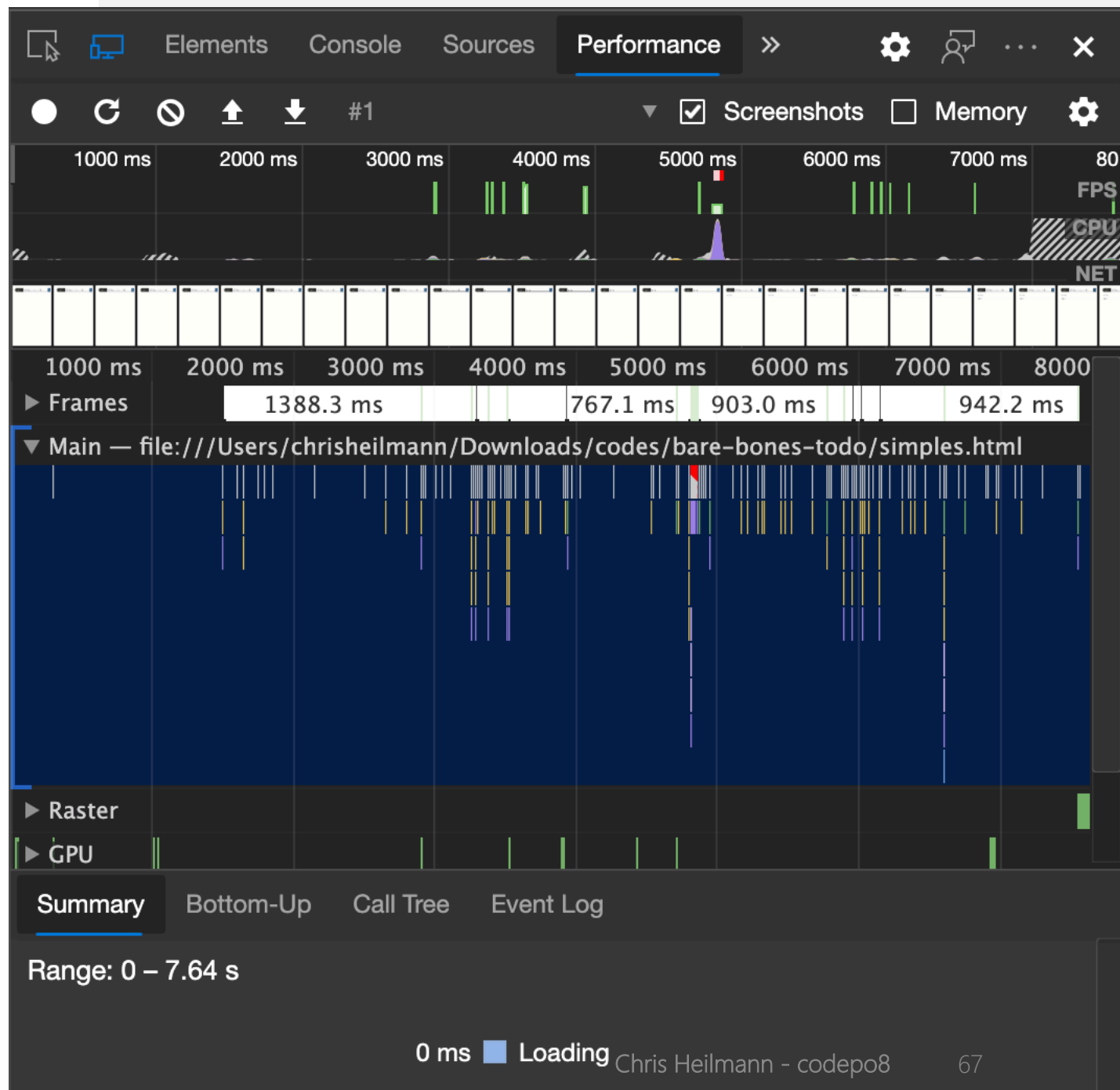
<https://github.com/WebKit/explainers>

# Popping the hood...





# What are developer tools made of?



## TABLE OF CONTENTS

- 1 Introduction
- 2 Foreground Color: the **'color'** property
- 3 Representing Colors: the **<color>** type
  - 3.1 Accessibility and Conveying Information By Color
  - 3.2 Color Spaces of Untagged Colors
  - 3.3 Resolving **<color>** Values
- 4 sRGB Colors
  - 4.1 The RGB functions: **'rgb()'**
  - 4.2 The RGB hexadecimal notation: **'#RRGGBB'**
- 5 Color Keywords
  - 5.1 Named Colors
  - 5.2 System Colors
  - 5.3 The **'transparent'** keyword
  - 5.4 The **'currentcolor'** keyword
- 6 HSL Colors: **'hsl()'** and **'hsla()'** functions
  - 6.1 Converting HSL colors to sRGB colors

Authors *may* also use these keywords at any time, but *should* be careful to use the colors in [matching background-foreground pairs](#) to ensure appropriate contrast, as any particular contrast relationship across non-matching pairs (e.g. **'Canvas'** and **'ButtonText'**) is not guaranteed.

The [<system-color>](#) keywords are defined as follows:

### **'Canvas'**

Background of application content or documents.

### **'CanvasText'**

Text in application content or documents.

### **'LinkText'**

Text in non-active, non-visited links.

### **'VisitedText'**

Open Developer Tools  
(CMD+SHIFT+I on Mac or  
F12/CTRL+SHIFT+I on Windows)

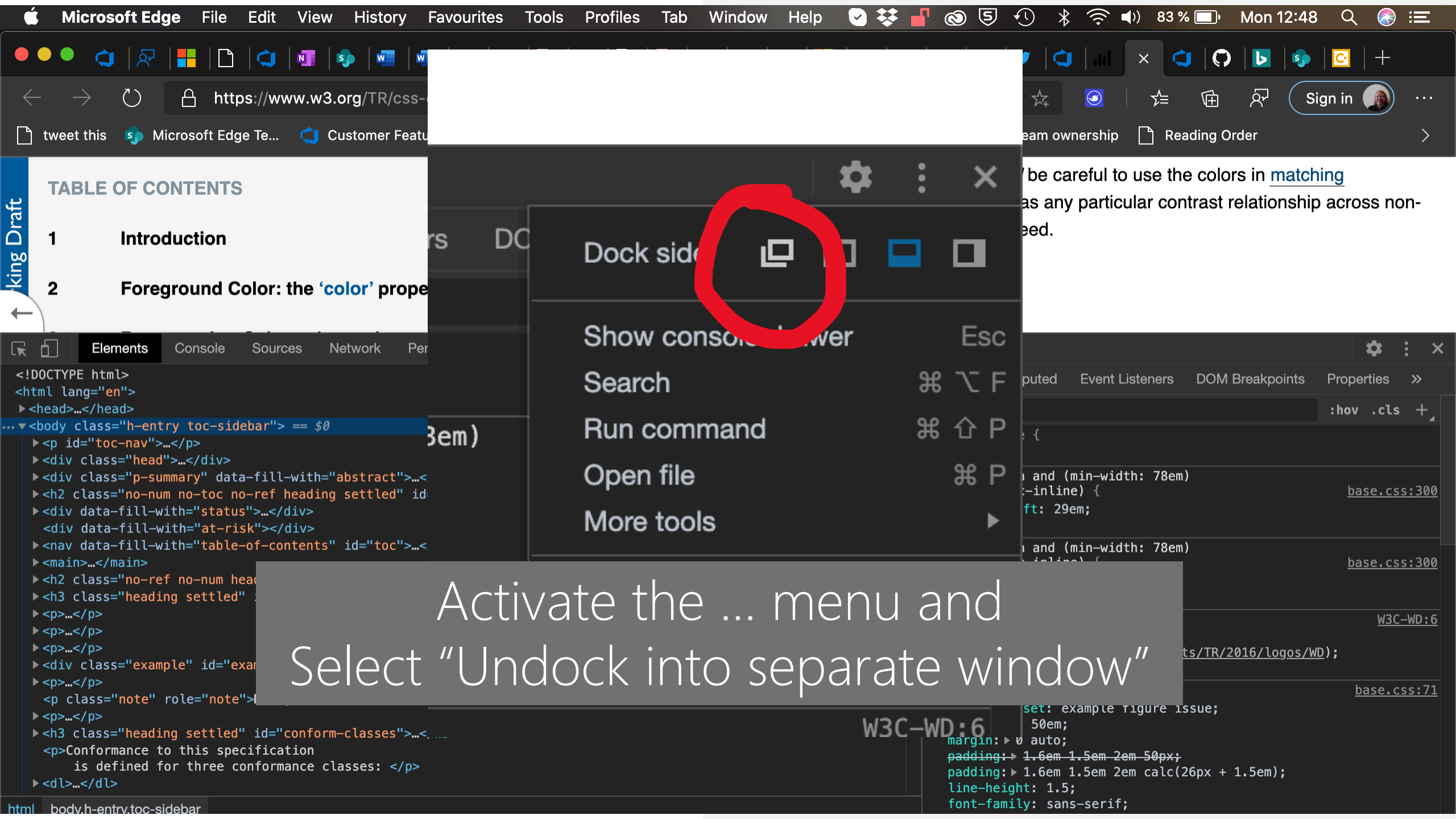
### **'Field'**

Background of input fields.

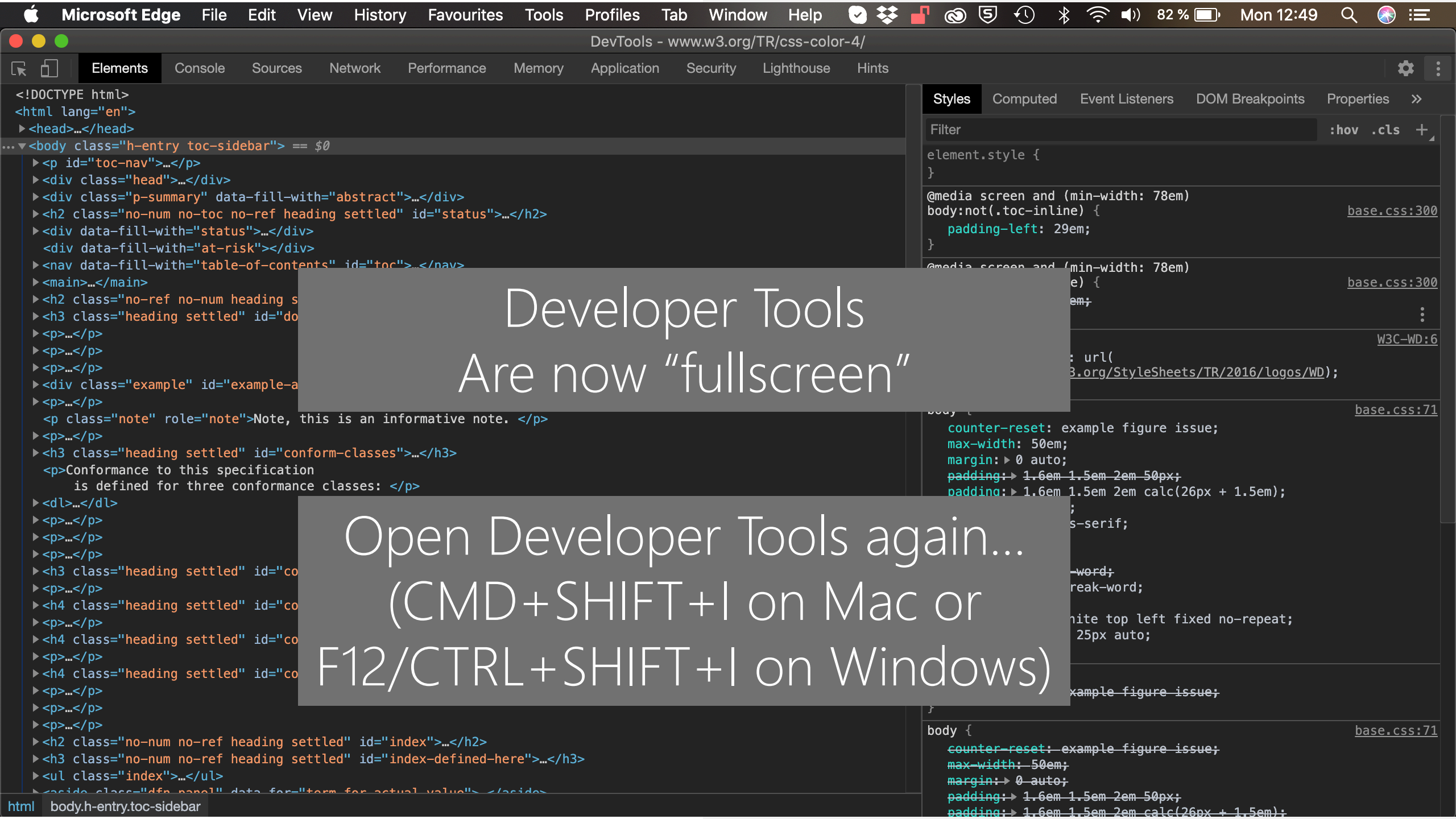
### **'FieldText'**

Text in input fields.



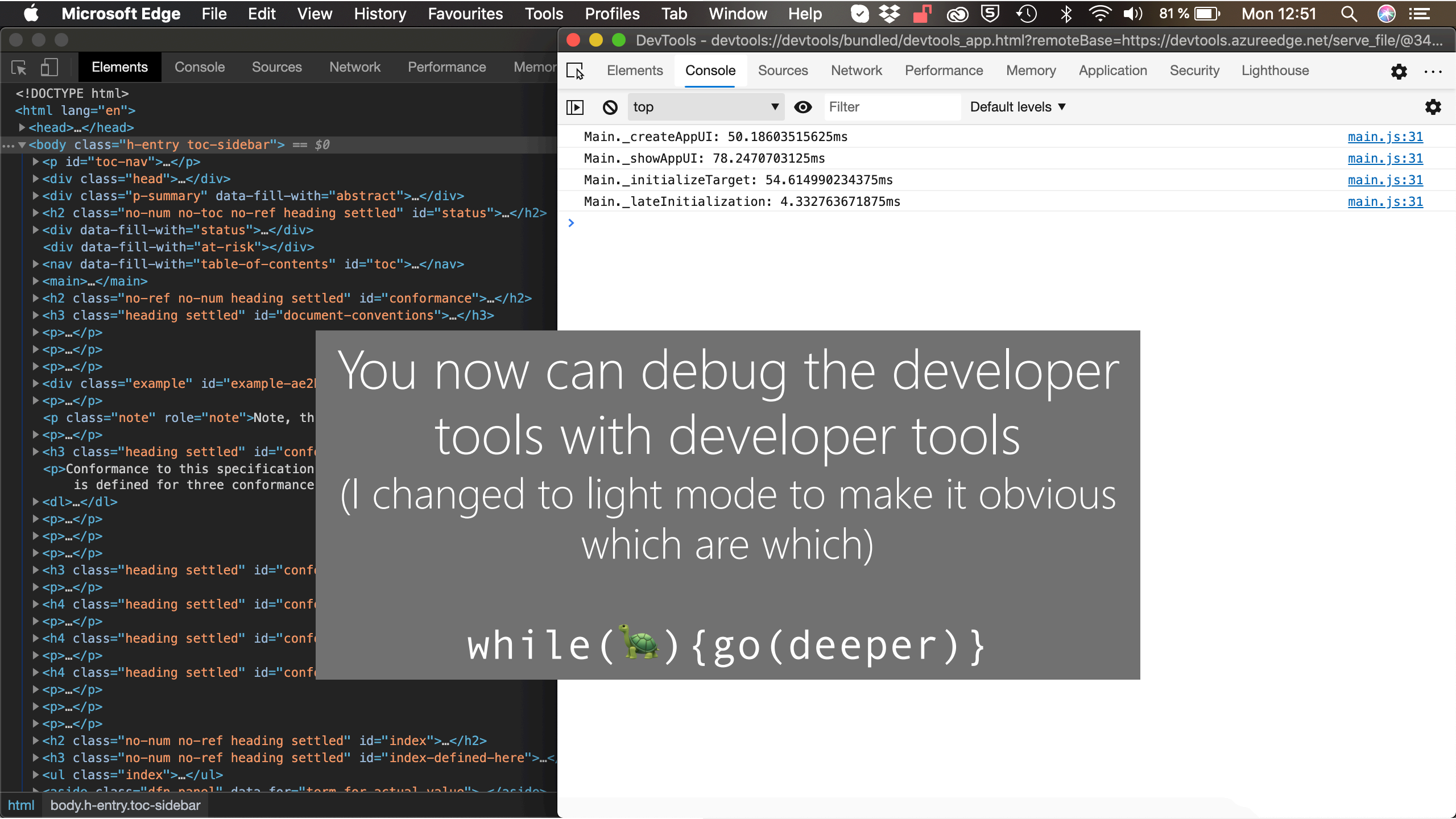


Activate the ... menu and  
Select "Undock into separate window"



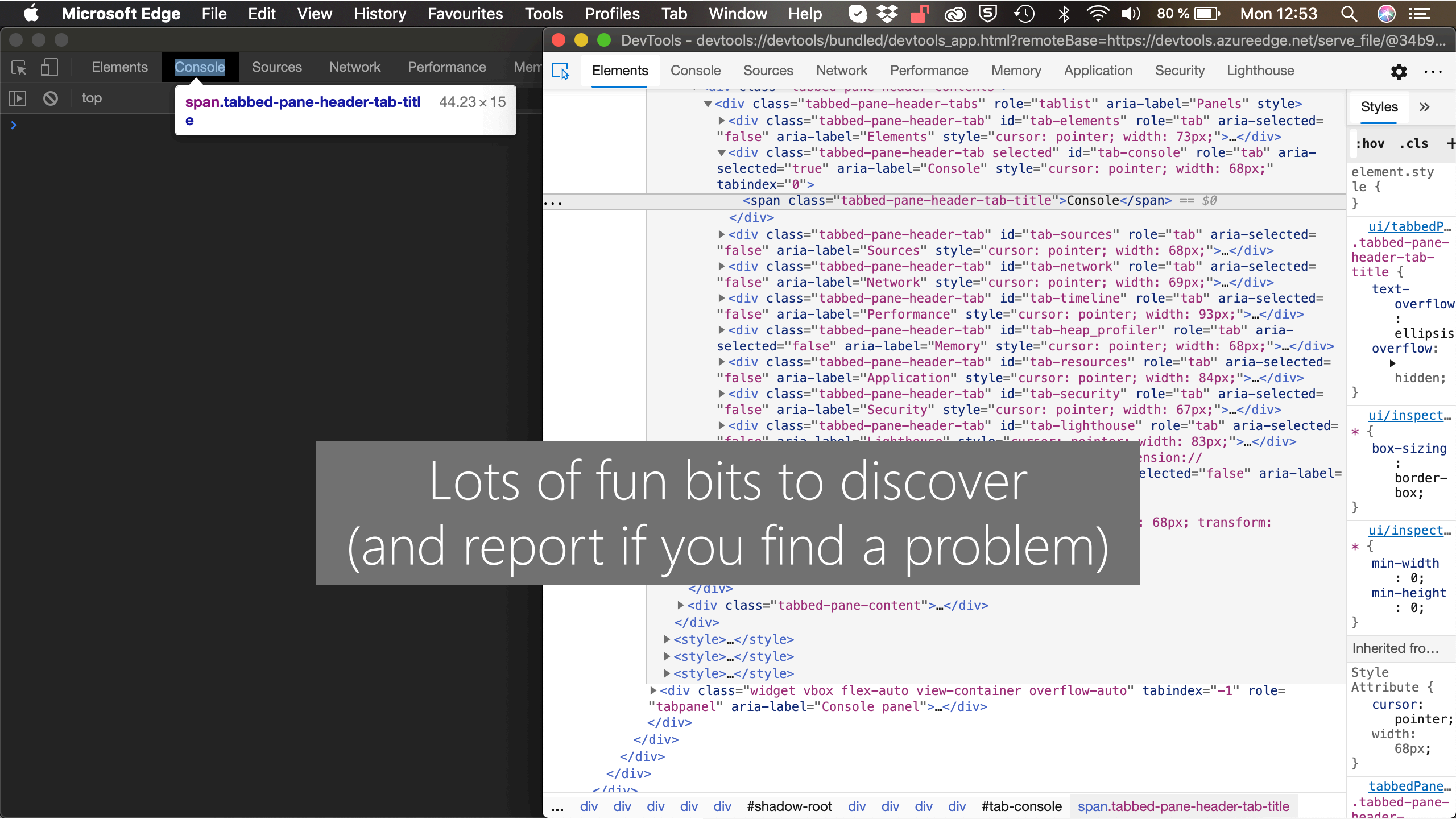
Developer Tools  
Are now "fullscreen"

Open Developer Tools again...  
(CMD+SHIFT+I on Mac or  
F12/CTRL+SHIFT+I on Windows)



You now can debug the developer  
tools with developer tools  
(I changed to light mode to make it obvious  
which are which)

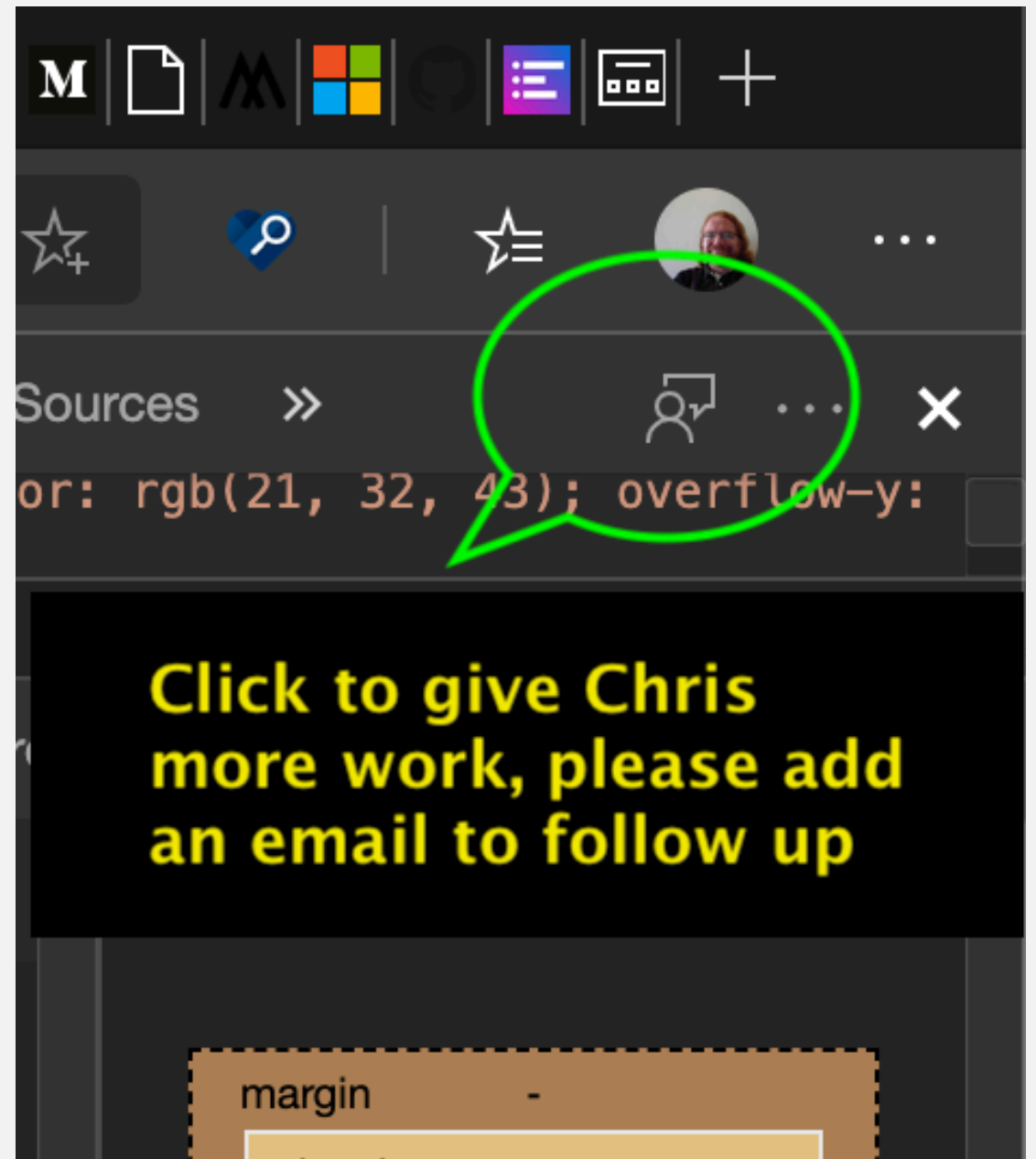
```
while(🐢) {go(deeper)}
```



Lots of fun bits to discover  
(and report if you find a problem)



In-built reporting  
tool...



# What makes me happy?





## What are developer tools made of?



- I like that we use web technology to build developer tools
- This makes them embeddable into other software (VS Code is an Electron shell with Monaco inside)
- It also allows us to build for the web on the web (CodePen, JSBin, Code Sandbox, Workspaces for GitHub)
- It is fun to work in them as you have a predictable environment – we can test upcoming web tech there.



# Little touches that go a long way...



```
const doFormStuff = (ev) => {  
  
};
```

# Little touches that go a long way...

```
const doFormStuff = (ev) => {  
  
};
```

```
const doFormStuff = (ev) => {  
  
};
```

```
document.querySelector('form').  
  |  addEventListener('submit', doFormStuff);
```



# Webhint: testing and best practices



- Testing tool to check web projects for:
  - Accessibility issues
  - Performance problems
  - App readiness
  - Compatibility with standards
  - Common pitfalls to avoid
  - Security issues
- Online service ([webhint.io](https://webhint.io)) or node package to integrate in other tools
- Highly customisable



# Webhint in VS Code



The screenshot shows the VS Code editor interface. The top bar displays the file 'logogen.js' with the extension 'logo-o-matic'. The editor has several tabs open: 'JS fonts.js', 'JS logogen.js' (active), '<> index.html', '<> rip.html', and '# logogen.css'. The active file 'logogen.js' contains a list of color names and their corresponding RGB values in an array format, ranging from line 62 to 76. Below the editor, the 'PROBLEMS' panel is open, showing two errors:

- rip.html** (1 error):
  - 'viewport' meta element was not specified. (meta-viewport) webhint [1, 1]
- index.html** (1 error):
  - 'a[download]' is not supported by Internet Explorer, iOS Safari. (compat-api/html) webhint [88, 6]

JS fonts.js

&lt;&gt; index.html &gt;

81

82

83

84

85

86

87

88

89

90

91

92

&lt;a&gt;

If the a element has an href attribute, then it represents a hyperlink (a hypertext anchor) labeled by its contents.

[MDN Reference](#)

'a[download]' is not supported by Internet Explorer, iOS Safari.

(compat-api/html) webhint

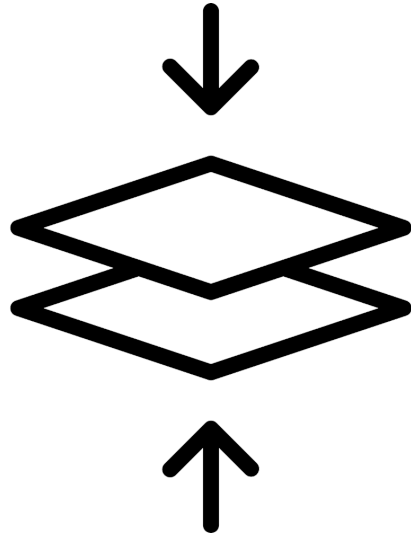
< Peek Problem (⌘F8) No quick fixes available

```
<a id="save" href="" download="">
```

```
<svg height='100%' width='100%' fill="#ffffff"  
viewBox="0 0 847 847" x="0px" y="0px" aria-labelledby="s
```

```
<title id="savetitle">Save</title>
```

```
<g>
```

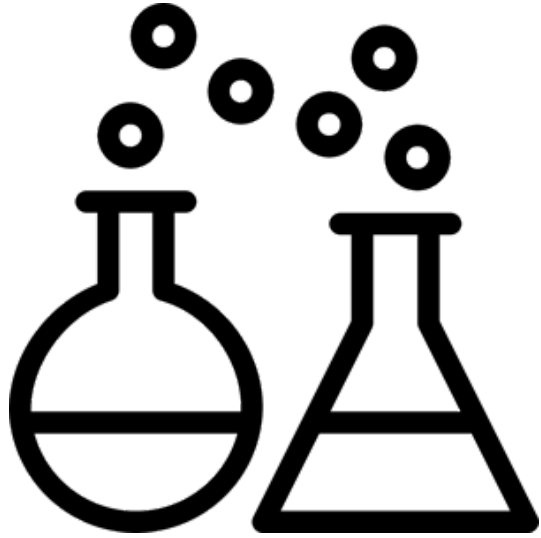


## Merging of tools



- VS Code is not only an editor, it also includes version control and a terminal
- This means I don't have to jump from one context to another to debug
- However... wouldn't it be cool to have Devtools in VS Code?





# Devtools for Code



- Edge/Chromium developer tools inside VS Code
- No need to switch to the browser to try a few things out
- No need to replicate the same functionality in both places

[aka.ms/elements4code](https://aka.ms/elements4code)

Elements × index.scss

localhost:4200/#/

# todos

walk the dog

1 item left All Active Completed

div 550px × 166px

Double click to edit a todo  
Created by Rens H. Jansen  
Part of TodoMVC

```
<!doctype html>
<html lang="en" data-framework="typescript">
  <head>...</head>
  <body>
    <section class="todoapp">
      <div>= $0
        <header class="header">
          <h1>todos</h1>
          <input class="new-todo" placeholder="What
            needs to be done?">
          </header>
          <section class="main">...</section>
          <footer class="footer">...</footer>
        </div>
      </section>
      <footer class="info">...</footer>
      <script type="text/javascript" src="node_modules/
        director/build/director.js"></script>
      <script type="text/javascript" src="js/bundle.js">
        </script>
      <dialog>...</dialog>
      <a class="url" href="https://bing.com" target=
        "_blank">Search</a>
    </body>
  </html>
```

Styles Computed Event Listeners >>

Filter :hov .cls +

element.style {

div { user agent styleshee

display: block;

Inherited from body

body { index.scss:2

font: 14px 'Helvetica Neue', Helvetica,

Arial, sans-serif;

line-height: 1.4em;

background: #f5f5f5;

color: #4d4d4d;

min-width: 230px;

max-width: 550px;

margin: 0 auto;

-webkit-font-smoothing: antialiased;

-moz-osx-font-smoothing: grayscale;

font-weight: 300;

}

margin -

border -

padding -

550 × 166.400

[aka.ms/elements4code](https://aka.ms/elements4code)

# Thanks – your voice matters!



Chris Heilmann

@codepo8

@EdgeDevTools

christianheilmann.com

Click the feedback in Edge developer tools!

