



# CSS PERFORMANCE

*with Jon Rohan*

*Thank you for coming*

# This talk is about

- Performance problems at GitHub
- How to create fast CSS and HTML
- CSS/HTML tools at GitHub



*Jon Rohan's*

# BRIEF ABOUT ME

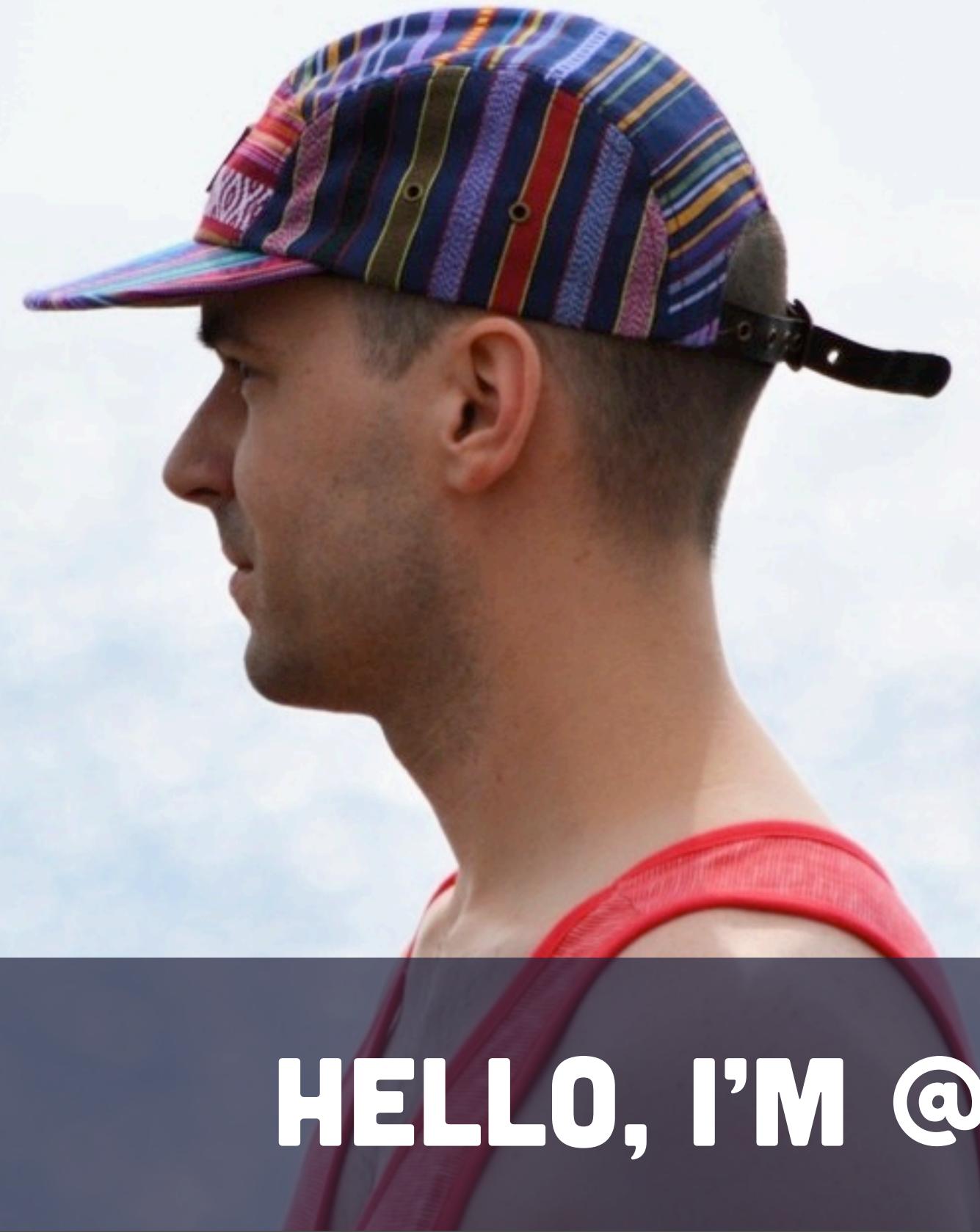


photo by Zachary Kaplan

**HELLO, I'M @JONROHAN**

I'm a Design-gineer

*B.S. Computer Science*

*8 years of css*

I'm a GitHubber



photo by @janaboruta



# PERFORMANCE WOES

SCARY

SLOW

GITHUB

SCARY

SLOW

GITHUB



I'm talking about diff pages

Bringing in the Awesome by bryanveloso · Pull Request #1 · github/codeconf

Search or type a command Explore Gist Blog Help jonrohan

github / codeconf PRIVATE Pull Request Watch Star Fork 1 0

Code Network Pull Requests 0 Issues 1 Wiki Graphs Admin

Closed 49 commits merged into `github:gh-pages` from `bryanveloso:gh-pages` almost 2 years ago 6,801 #1

Discussion Commits 49 Files Changed 63

Showing 63 changed files with 6,678 additions and 123 deletions. Show Diff Stats

485 View file @ 3aed6da

css/base.css

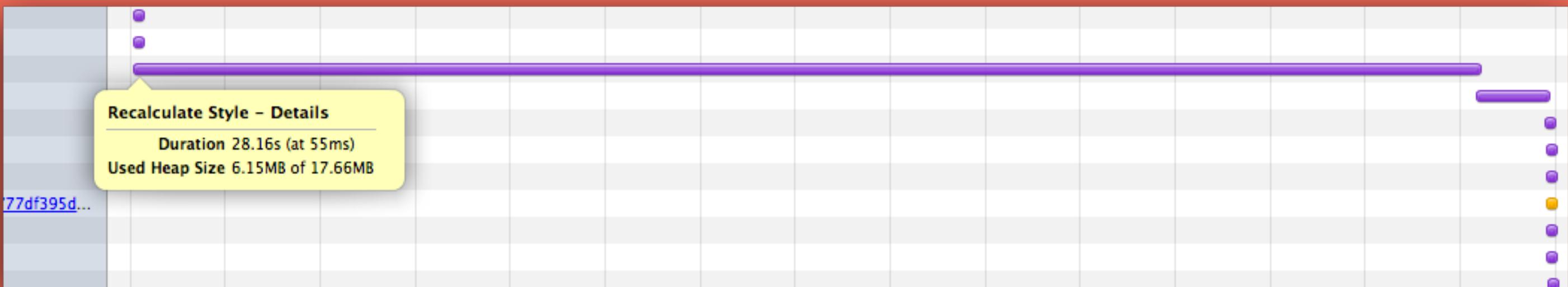
```
@@ -1,113 +1,426 @@
/*
- @group Global Reset
+/* @group Global Reset
 *
 * {
- padding:0;
- margin:0;
+ padding: 0;
+ margin: 0;
}
-h1, h2, h3, h4, h5, h6, p, pre, blockquote, label, ul, ol, dl, fieldset, address { margin:1em 0; }
-li, dd { margin-left:5%; }
+h1, h2, h3, h4, h5, h6, p, pre, blockquote, label, ul, ol, dl, fieldset, address { margin: 1em 0; }
+li, dd { margin-left: 5%; }
fieldset { padding: .5em; }
```

“a medium size diff”



*~9,000 lines across all files*

*~80% of pageload is recalculating*



28.16s to recalculate style!

*what causes style recalculating?*

# *Manipulating the DOM*

*Hiding using `display: none;`*  
*and `visibility: hidden;`.*

*CSS Animations*

User Actions

*All this is bad and...*

*may cause browser death*



**Aw, Snap!**

Something went wrong while displaying this keynote To  
continue, press Reload or go to another talk.



# TROUBLE CSS

**no unnecessary tag identifiers**

```
1 ul#navigation,  
2 ul.menu {  
3   margin-left: 0;  
4 }
```

```
1 #navigation,  
2 .menu {  
3   margin-left: 0;  
4 }
```

no ancestors

```
1 html div tr td {  
2   font-weight: bold;  
3 }
```

```
1 html div tr td {  
2   font-weight: bold;  
3 }
```

```
1 html div tr td {  
2   font-weight: bold;  
3 }
```

```
1 html div tr td {  
2   font-weight: bold;  
3 }
```

*no universal selectors*

```
1 * {
2   display: block;
3 }
```

*no unqualified selectors*

```
1 [class^="mini-icon-"] {  
2   display: block;  
3 }
```

*no chaining*

```
1 .small.private.icon {  
2   width: 30px;  
3 }
```

```
1 .small-private-icon {  
2   width: 30px;  
3 }
```

*order of importance*  
*(when you do chain)*

webkit bug?

```
1 .foo.bar {  
2   width: 30px;  
3 }
```

*Indexed in* m\_classRules

*under the key* .foo

```
1 .bar.foo {  
2   width: 30px;  
3 }
```

*Indexed in* m\_classRules

*under the key* .bar

```
1 input[type=text].error {  
2   width: 30px;  
3 }
```

*Indexed in* m\_tagRules

```
1 input.error[type=text] {  
2   width: 30px;  
3 }
```

*Indexed in* **m\_classRules**

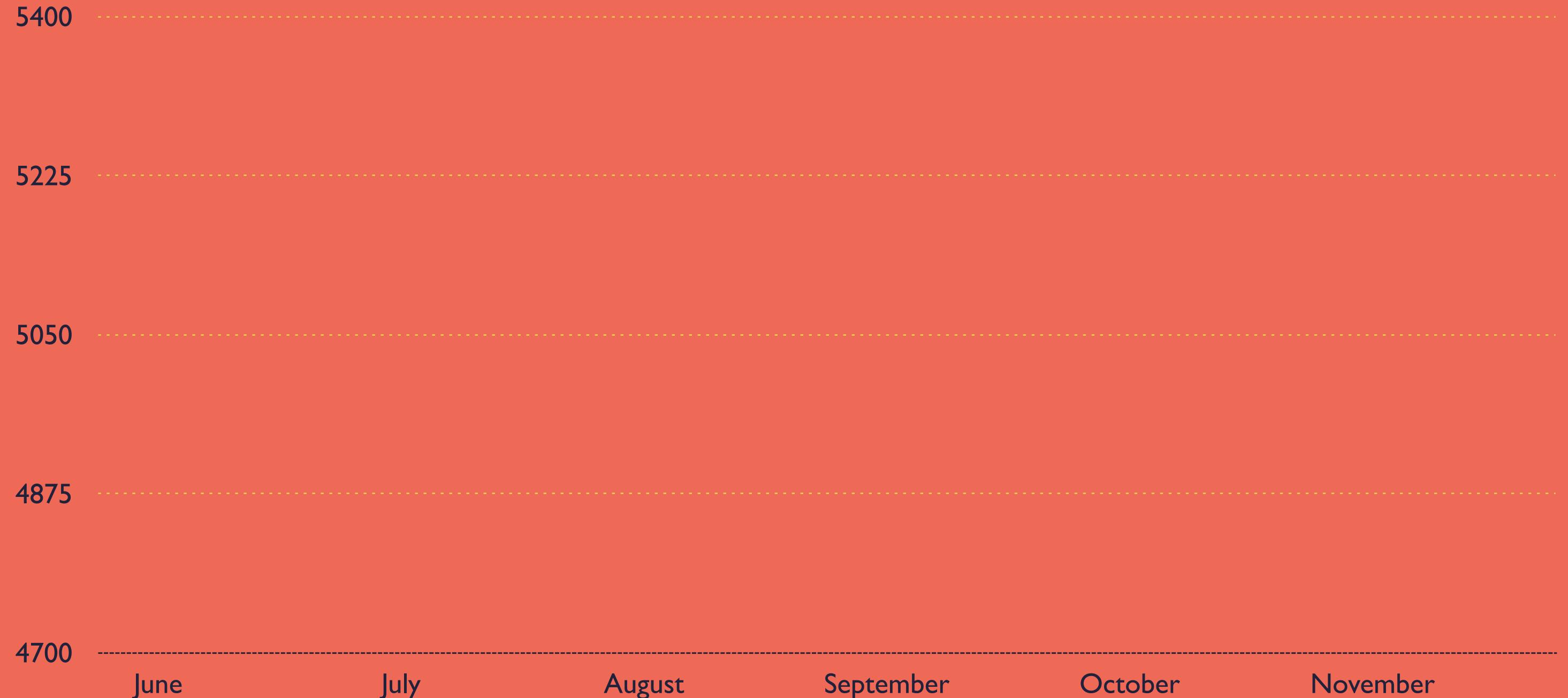
```
1 .bar#foo {  
2   width: 30px;  
3 }
```

*Indexed in* **m\_classRules**

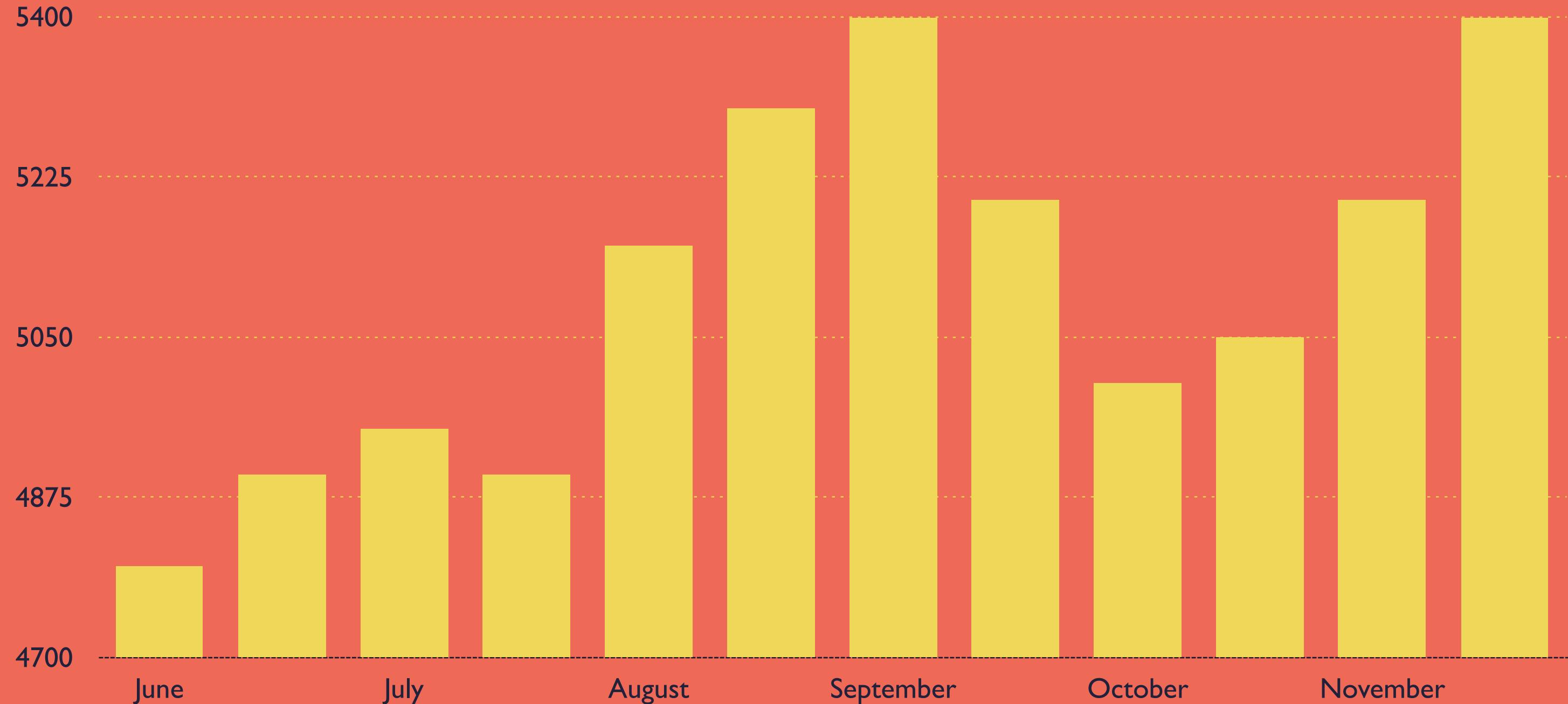
```
1 #foo.bar {  
2   width: 30px;  
3 }
```

*Indexed in* m\_idRules

# number of ess selectors



# number of ess selectors



*It's all relative*

*CSS + HTML*



# HTML OVERLOAD

*how much html do we have?*

*a typical diff line*

```
1 <tr>
2   <td class="line_number"><a id="L1L5" href="#L1L5">5</a></td>
3   <td class="line_number"><a id="L1R7" href="#L1R7">7</a></td>
4   <td width="100%">
5     <div class="add-bubble"></div>
6     <pre><div>+ this is a line in the diff</div></pre>
7   </td>
8 </tr>
```

*average diffs have around ~9,000 lines*

```
> $( '#files_bucket * ').length
```

```
> $('#files_bucket *').length  
48917
```

*but that's not all of the problem*



```
1  /*-----  
2   - @group Global Reset  
3   1  +/* @group Global Reset  
4   2  -----*/  
4   3  * {  
5   -  padding:0;  
6   -  margin:0;  
4   +  padding: 0;  
5   +  margin: 0;  
7   6  }  
8  -h1, h2, h3, h4, h5, h6, p, pre, blockquote, label, ul, ol, dl, fieldset, address { margin:1em 0; }  
9  -li, dd { margin-left:5%; }  
7  +h1, h2, h3, h4, h5, h6, p, pre, blockquote, label, ul, ol, dl, fieldset, address { margin: 1em 0; }  
8  +li, dd { margin-left: 5%; }
```

Bringing in the Awesome by bryaneloso · Pull Request #1 · github/codeconf

```
1  -/*-----
2  -  @group Global Reset
3  1  +/* @group Global Reset
4  2  -----*/
5  3  * {
6  5  -  padding:0;
7  6  -  margin:0;
8  4  +  padding: 0;
9  5  +  margin: 0;
7  7  -h1, h2, h3, h4, h5, h6, p, pre, blockquote, label, ul, ol, dl, fieldset, address { margin:1em 0; }
9  9  -li, dd { margin-left:5%; }
7  7  +h1, h2, h3, h4, h5, h6, p, pre, blockquote, label, ul, ol, dl, fieldset, address { margin: 1em 0; }
8  8  +li, dd { margin-left: 5%; }
```

15ms pageload

*what can we do?*

*reduce the amount of matched html*

Developer Tools - https://github.com/github/codeconf/pull/1/files

Elements Resources Network Sources Timeline Profiles Audits Console

**Profiles**

**CSS SELECTOR PROFILES**

**Profile 1 (55 ms)**

Selector	Source	Total	Matches
html, body, div, span, applet, object, iframe, h1, h2, h3, h4, h5, h6, p, blockquote, pre, a, abbr, acronym, address, b, em, strong, i, small, u, big, code, kbd, samp, strong, b		28.2%	3767
.mini-icon, .mega-icon		7.2%	1790
pre, xmp, plaintext, listing		5.4%	904
#files .add-bubble		5.3%	909
pre, code, tt		4.2%	882
.mini-icon		3.8%	1035
.mini-icon-add-comment::before		3.2%	901
#files .file .data .line, .file-box .data .line		3.1%	882
#files tr:hover .add-bubble		2.5%	909
#files tr:hover .add-bubble		2.4%	24
#files .file .view-modes ul.view-modes-menu li, .file-box .view-modes ul.view-modes-menu li		1.8%	432
ul, menu, dir		1.6%	117
#files .file .view-modes ul.view-modes-menu, .file-box .view-modes ul.view-modes-menu		1.4%	108
.progress-bar		1.2%	78
#files .file .meta .info span.icon, #files .file .meta .info span.diffstat, .file-box .meta .info span.icon		1.2%	63
#files .file .meta .info span:first-child, #files .file .meta .icon + span, #files .file .meta .diffstat + span,...		1.2%	189
li		1.1%	596
div		1.0%	300
#files .file .view-modes ul.view-modes-menu li:first-child, .file-box .view-modes ul.view-modes-menu li:first-c...		1.0%	108
#files .file .meta .info span, .file-box .meta .info span		0.9%	189
#files .progress .progress-bar, .file-box .progress .progress-bar		0.8%	78
span.diffstat		0.8%	64
#files .file .meta .actions li:first-child, .file-box .meta .actions li:first-child		0.7%	126
span.diffstat.diffstat-bar		0.7%	64
a:-webkit-any-link		0.6%	231
#files .file .meta .actions li, .file-box .meta .actions li		0.5%	126
#files .file .view-modes ul.view-modes-menu li.active, .file-box .view-modes ul.view-modes-menu li.active		0.4%	106
.button-group li		0.4%	126
.minibutton, .minibutton.disabled:hover, .button-group .disabled.grouped-button:hover, .minibutton:disabled:h...		0.4%	134
#files .progress, .file-box .progress		0.4%	48
#files .file .image img, .file-box .image img, #files .file .image canvas, .file-box .image canvas		0.3%	40
img		0.3%	84
tt, code, kbd, samp		0.3%	126
#files .file .view-modes ul.view-modes-menu li:hover, .file-box .view-modes ul.view-modes-menu li:hover		0.3%	0

%

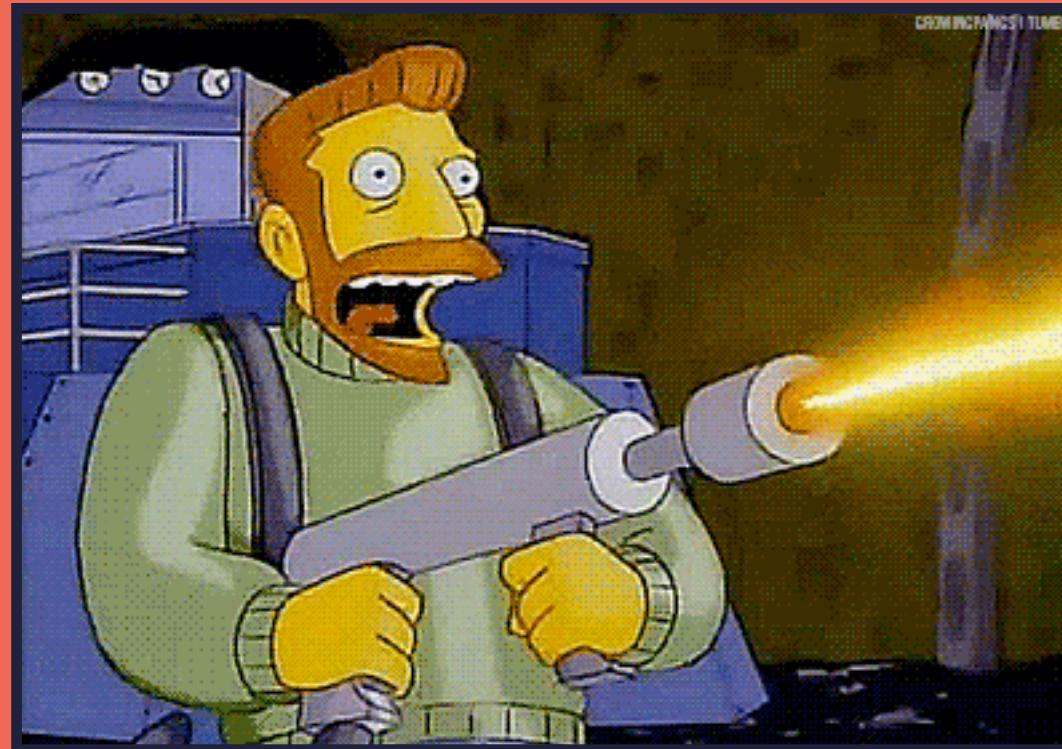


# SOLUTIONS

*think simple*

*remove unnecessary html*

kill it



with fire

```
1 <tr>
2   <td class="line_number"><a id="L1L5" href="#L1L5">5</a></td>
3   <td class="line_number"><a id="L1R7" href="#L1R7">7</a></td>
4   <td width="100%">
5     <div class="add-bubble"></div>
6     <pre><div>+ this is a line in the diff</div></pre>
7   </td>
8 </tr>
```

```
1 <tr>
2   <td class="line_number"><a id="L1L5" href="#L1L5">5</a></td>
3   <td class="line_number"><a id="L1R7" href="#L1R7">7</a></td>
4   <td width="100%">
5     <div class="add-bubble"></div>
6     <pre>+ this is a line in the diff</pre>
7   </td>
8 </tr>
```

6,387 unnecessary *divs*

*remove <a> for line numbers*

```
1 <tr>
2   <td class="line_number"><a id="L1L5" href="#L1L5">5</a></td>
3   <td class="line_number"><a id="L1R7" href="#L1R7">7</a></td>
4   <td width="100%">
5     <div class="add-bubble"></div>
6     <pre>+ this is a line in the diff</pre>
7   </td>
8 </tr>
```

```
1 <tr>
2   <td id="L1L5" class="line_number linkable-line-numbers">5</td>
3   <td id="L1R7" class="line_number linkable-line-numbers">7</td>
4   <td width="100%">
5     <div class="add-bubble"></div>
6     <pre>+ this is a line in the diff</pre>
7   </td>
8 </tr>
```

*Improved Render speed by 37%*

<6>EES!!!



<6>EES!!!

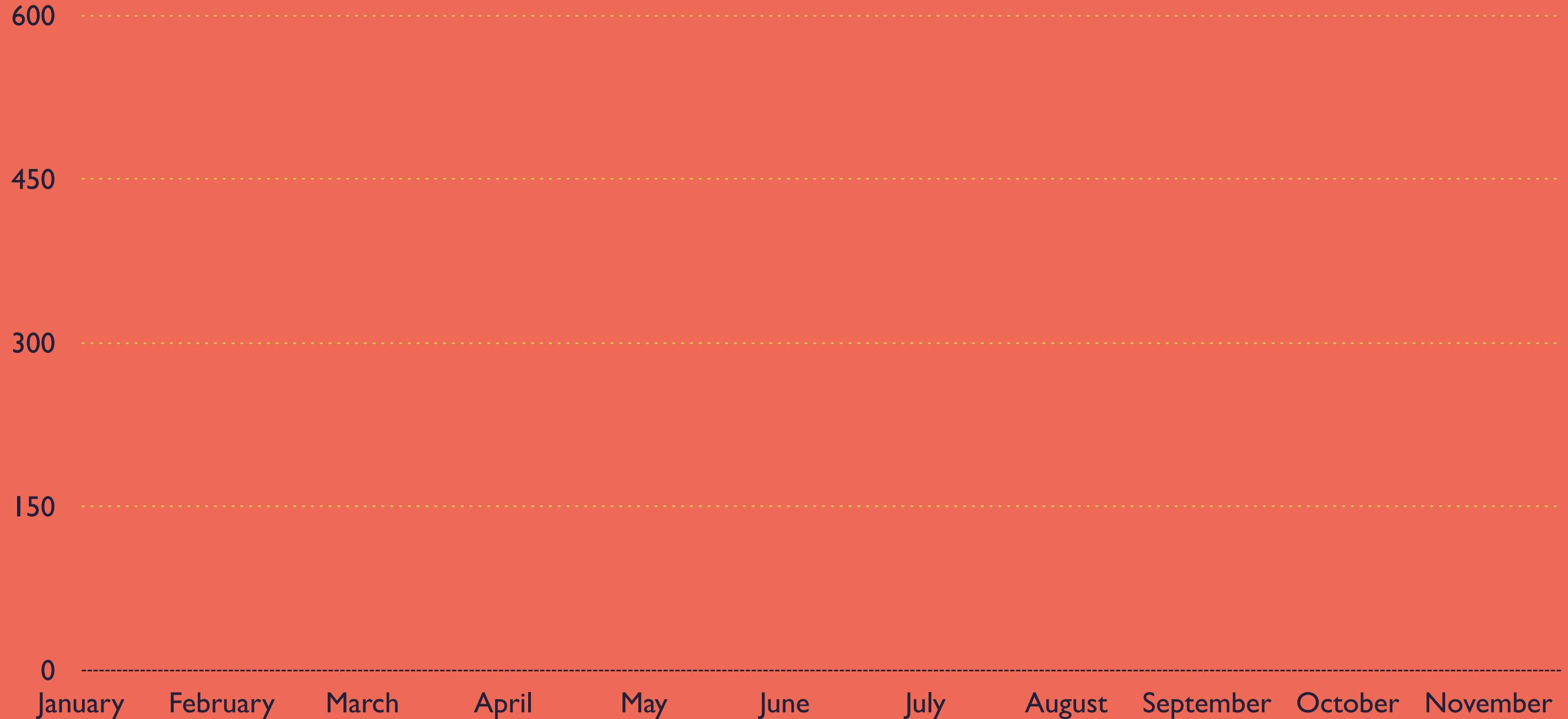
```
1 <tr>
2   <td id="L1L5" class="line_number linkable-line-numbers">5</td>
3   <td id="L1R7" class="line_number linkable-line-numbers">7</td>
4   <td width="100%">
5     <div class="add-bubble"></div>
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8 </tr>
```

```
1 <tr>
2   <td id="L1L5" class="line_number linkable-line-numbers">5</td>
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4   <td width="100%">
5     <b class="add-bubble"></b>
6     <pre>+ this is a line in the diff</pre>
7   </td>
8 </tr>
```

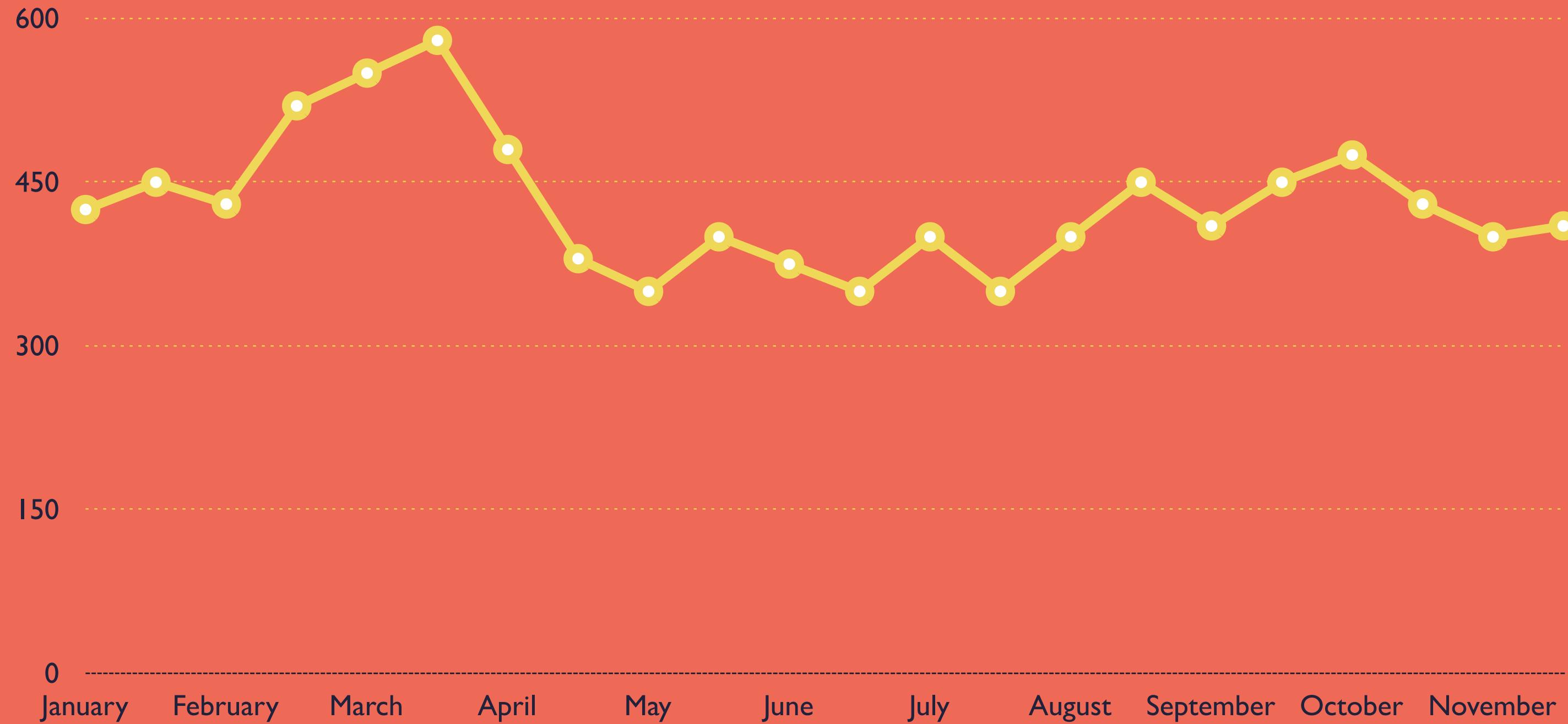
*3.5% speed improvement*

*did it help?*

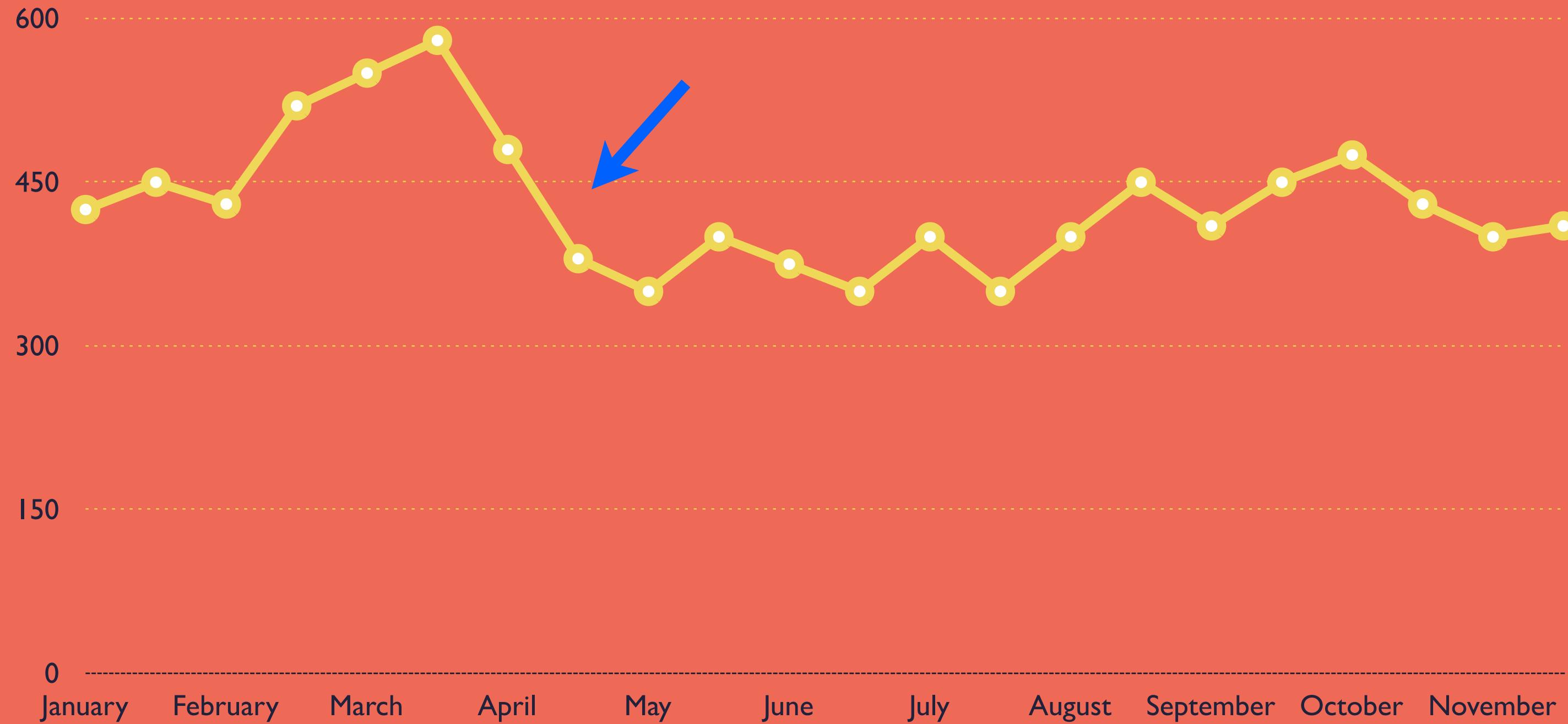
# *pageload time last 12 months*



# *pageload time last 12 months*



# *pageload time last 12 months*





# SHORTCUTS

*GitHub Primer*

*refactor css into reusable components*



SWEET! CSS



~~sweet!~~ CSS  
selectors

*SASS is powerful and dangerous*

```
1 button.classy, a.button.classy,  
2 button.classy:disabled:hover, a.button.classy.disabled:hover {  
3   border-radius: 3px;  
4   &.primary {  
5     color: #fff;  
6     &:hover { border-color: #4a993e; }  
7     &.mousedown { border-bottom-color: darken(#8add6d, 10%); }  
8     &:disabled, &.disabled {  
9       &, &:hover {  
10         border-color: #74bb5a;  
11       }  
12     }  
13   }  
14 }
```

```
button.classy:disabled:hover.  
mousedown, a.button.classy:dis  
abled:hover.mousedown, a.butto  
n.classy.disabled:hover.mouse  
down . . .
```

Max indent 3 levels

*Wow, that was easy*

*NOPE*

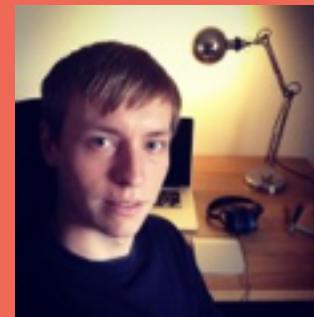
*GitHub has grown*

# people who touched css



Receive Stache

# *css developers*



*restraint sucks!*

*GitHub operates like open source*



*GitHub's*

# TOOLS

*CSS Explain*

*"Think of it like SQL EXPLAIN, but for CSS selectors."*

- <https://github.com/josh/css-explain>

CSS Explain

josh.github.com/css-explain/ Reader

# CSS EXPLAIN

.bar#foo

Category	ID	Class	Tag	Universal
Specificity	1	1	0	

ID is overly qualified by a class name

```
> cssExplain("li .item")
{
  "selector": "li .item",
  "parts": ["li", ".item"],
  "specificity": [0, 1, 1],
  "category": "class",
  "key": "item",
  "score": 6
}
```

*WebKit Dev Tools*

*css Profiler*

Developer Tools - https://github.com/github/codeconf/pull/1/files

Elements Resources Network Sources Timeline Profiles Audits Console

**Profiles**

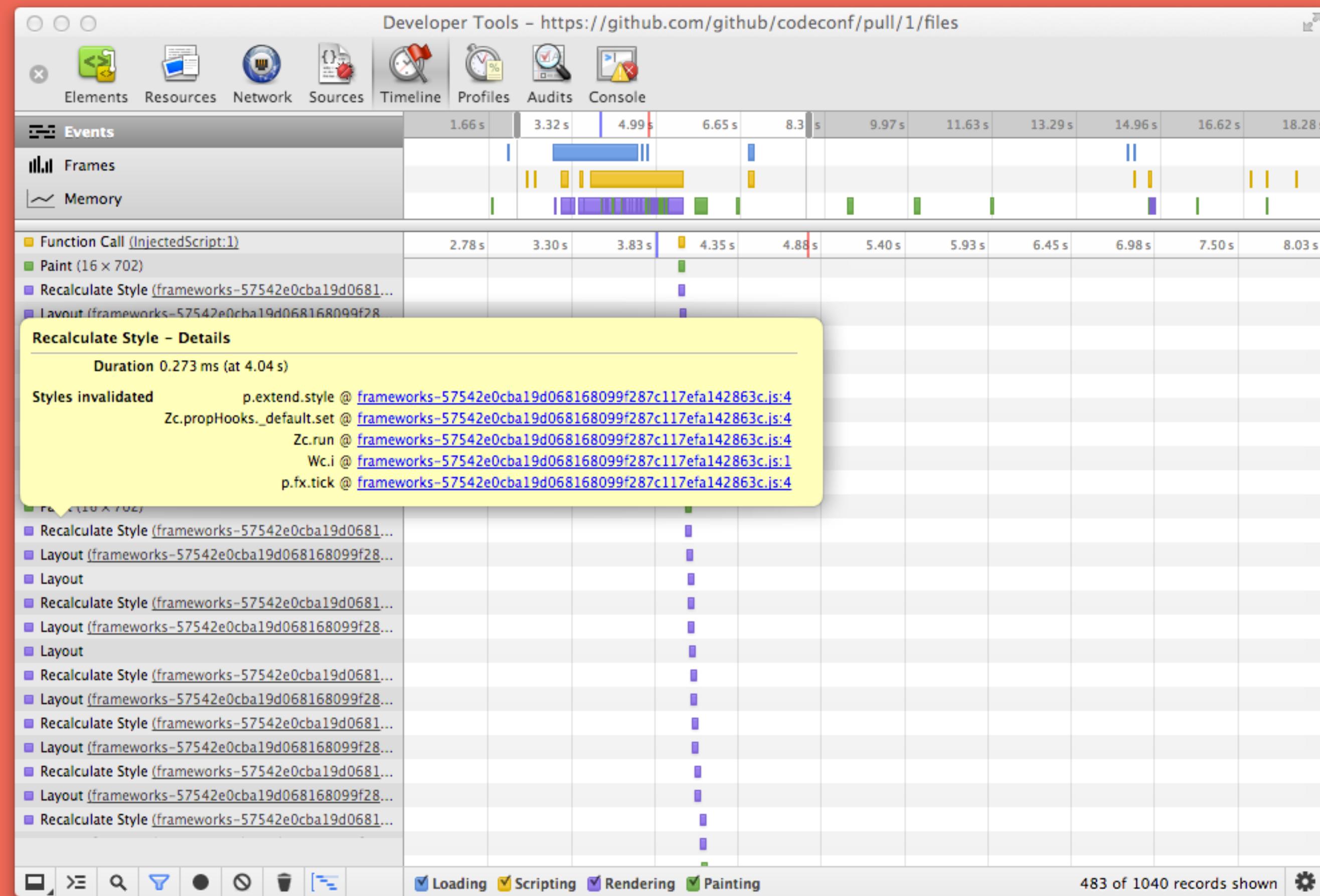
**CSS SELECTOR PROFILES**

**Profile 1 (55 ms)**

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.mini-icon, .mega-icon		7.2%	1790
pre, xmp, plaintext, listing		5.4%	904
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#files .file .data .line, .file-box .data .line		3.1%	882
#files tr:hover .add-bubble		2.5%	909
#files tr:hover .add-bubble		2.4%	24
#files .file .view-modes ul.view-modes-menu li, .file-box .view-modes ul.view-modes-menu li		1.8%	432
ul, menu, dir		1.6%	117
#files .file .view-modes ul.view-modes-menu, .file-box .view-modes ul.view-modes-menu		1.4%	108
.progress-bar		1.2%	78
#files .file .meta .info span.icon, #files .file .meta .info span.diffstat, .file-box .meta .info span.icon		1.2%	63
#files .file .meta .info span:first-child, #files .file .meta .icon + span, #files .file .meta .diffstat + span, ...		1.2%	189
li		1.1%	596
div		1.0%	300
#files .file .view-modes ul.view-modes-menu li:first-child, .file-box .view-modes ul.view-modes-menu li:first-c...		1.0%	108
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#files .progress .progress-bar, .file-box .progress .progress-bar		0.8%	78
span.diffstat		0.8%	64
#files .file .meta .actions li:first-child, .file-box .meta .actions li:first-child		0.7%	126
span.diffstat.diffstat-bar		0.7%	64
a:-webkit-any-link		0.6%	231
#files .file .meta .actions li, .file-box .meta .actions li		0.5%	126
#files .file .view-modes ul.view-modes-menu li.active, .file-box .view-modes ul.view-modes-menu li.active		0.4%	106
.button-group li		0.4%	126
.minibutton, .minibutton.disabled:hover, .button-group .disabled.grouped-button:hover, .minibutton:disabled:h...		0.4%	134
#files .progress, .file-box .progress		0.4%	48
#files .file .image img, .file-box .image img, #files .file .image canvas, .file-box .image canvas		0.3%	40
img		0.3%	84
tt, code, kbd, samp		0.3%	126
#files .file .view-modes ul.view-modes-menu li:hover, .file-box .view-modes ul.view-modes-menu li:hover		0.3%	0

%

*Timeline*



*Audits*

Developer Tools – http://github.dev/

Elements Resources Network Sources Timeline Profiles Audits Console PageSpeed

Audits

RESULTS

http://github.dev/ (1)

► Serve static content from a cookieless domain (6)

▼ Web Page Performance

● ► Optimize the order of styles and scripts (108)

● ► Remove unused CSS rules (3806)

396.25KB (79%) of CSS is not used by the current page.

- [reset.css](#): 207B (17%) is not used by the current page.
- [books.css](#): 274B (100%) is not used by the current page.
- [callouts.css](#): 5.82KB (98%) is not used by the current page.
- [forms.css](#): 8.78KB (86%) is not used by the current page.
- [navigation.css](#): 3.95KB (88%) is not used by the current page.
- [plans.css](#): 2.01KB (100%) is not used by the current page.
- [notification\\_settings.css](#): 1.90KB (100%) is not used by the current page.
- [listings-layout.css](#): 2.27KB (95%) is not used by the current page.
- [jquery.date\\_input.css](#): 1.95KB (87%) is not used by the current page.
- [jquery.facebox.css](#): 458B (57%) is not used by the current page.
- [jquery.tipsy.css](#): 1.85KB (100%) is not used by the current page.
- [code-frequency.css](#): 1.02KB (100%) is not used by the current page.
- [commit-acitivity.css](#): 1.13KB (100%) is not used by the current page.
- [contributors.css](#): 1.89KB (93%) is not used by the current page.
- [index.css](#): 3.28KB (91%) is not used by the current page.
- [punchcard.css](#): 260B (87%) is not used by the current page.
- [icons.css](#): 302B (2%) is not used by the current page.
- [markdown.css](#): 5.89KB (83%) is not used by the current page.
- [pygments.css](#): 3.09KB (100%) is not used by the current page.
- [buttons.css](#): 4.01KB (17%) is not used by the current page.
- [nav.css](#): 2.08KB (96%) is not used by the current page.
- [sticky.css](#): 167B (100%) is not used by the current page.
- [about\\_page.css](#): 6.53KB (100%) is not used by the current page.
- [account.css](#): 2.36KB (93%) is not used by the current page.

✖ 1 ⚠ 1 ⚙

▼ [dashboard.css](#): 6.88KB (44%) is not used by the current page.

```
p.tip
p.tip strong.protip
.bootcamp
.bootcamp h1
.bootcamp h1 a
.bootcamp h1 span
.bootcamp .mini-icon-remove-close
.bootcamp .dismiss-bootcamp
.bootcamp .bootcamp-body
.bootcampo ul
.bootcamp ul li
.bootcamp ul li a
.bootcamp .image
```

*Graphite*

*“Graphite is a highly scalable real-time graphing system.”*

- <http://graphite.wikidot.com/faq>

*carbon (backend)*

*"Data collection agents connect to carbon and send their data..."*

- <http://graphite.wikidot.com/carbon>

*whisper (DB)*

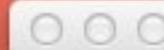
*"It provides fast, reliable storage of numeric data over time."*

- <http://graphite.wikidot.com/whisper>

*The Graph Store*



*Graphs Everywhere*



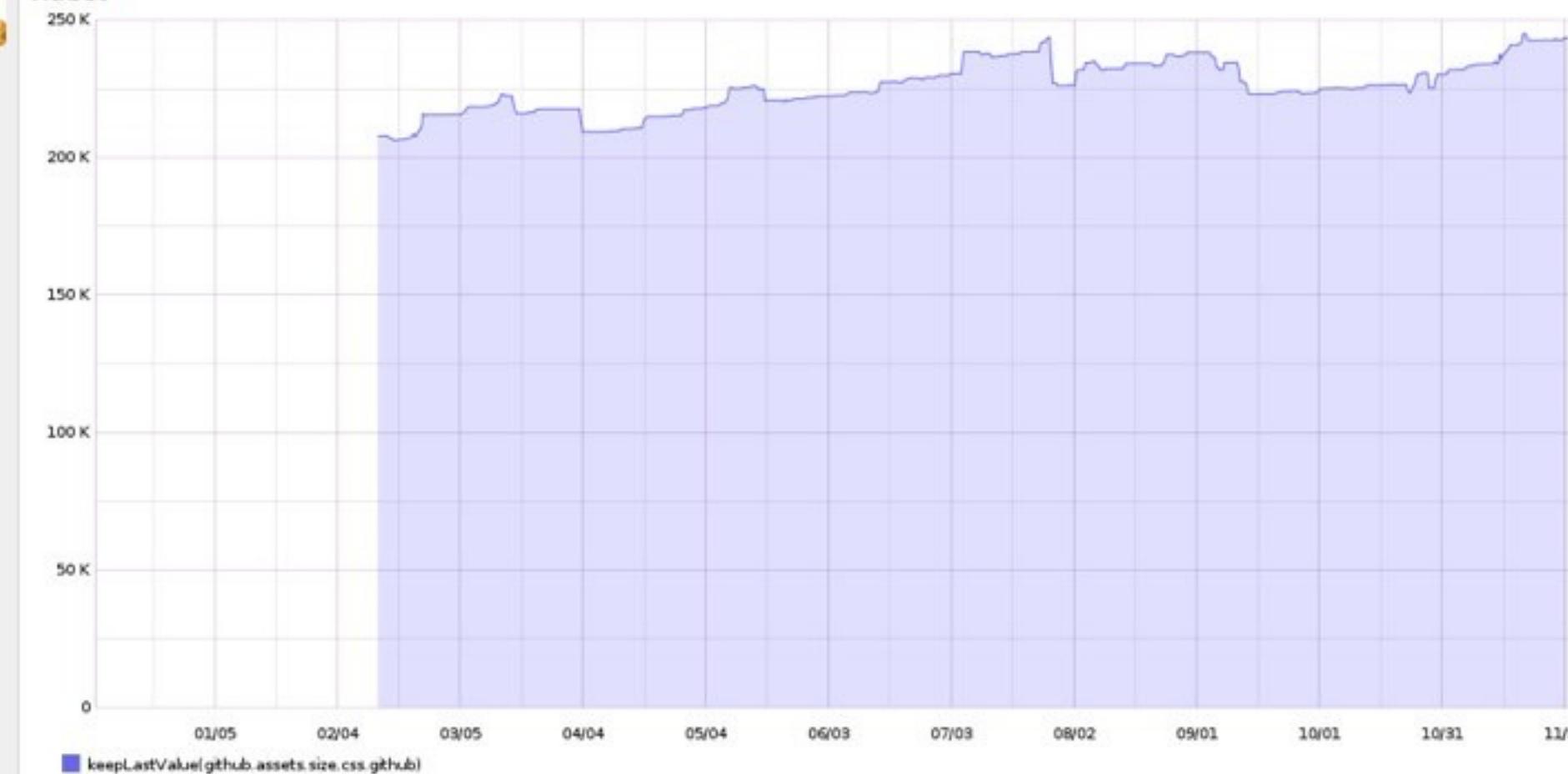
github: The Design Room



The Design Room Call me SkrillUX. I drop the SASS.

See messages from [earlier today](#)

Nov 30 9:55 PM

**jonrohan** Jon Rohan  
/graph me -12months @assets.size.css.github**Hubot**

The Design Room



*Jon Rohan's*

# **TOO LONG; DIDN'T READ**

*Simplified CSS*

*Try to minimize HTML DOM matches*

*Refactor and reuse CSS*

Teamwork

*Graph and Monitor Everything*

# Thank you



@jonrohan

You can find this presentation at <http://speakerdeck.com/jonrohan>