# CSS for the "Next Billion Users"

CSSDay.NL 2018

# Ire Aderinokun

# E + Rey

🇳🇬

bitsofcode

Google Developers Experts

eye/o

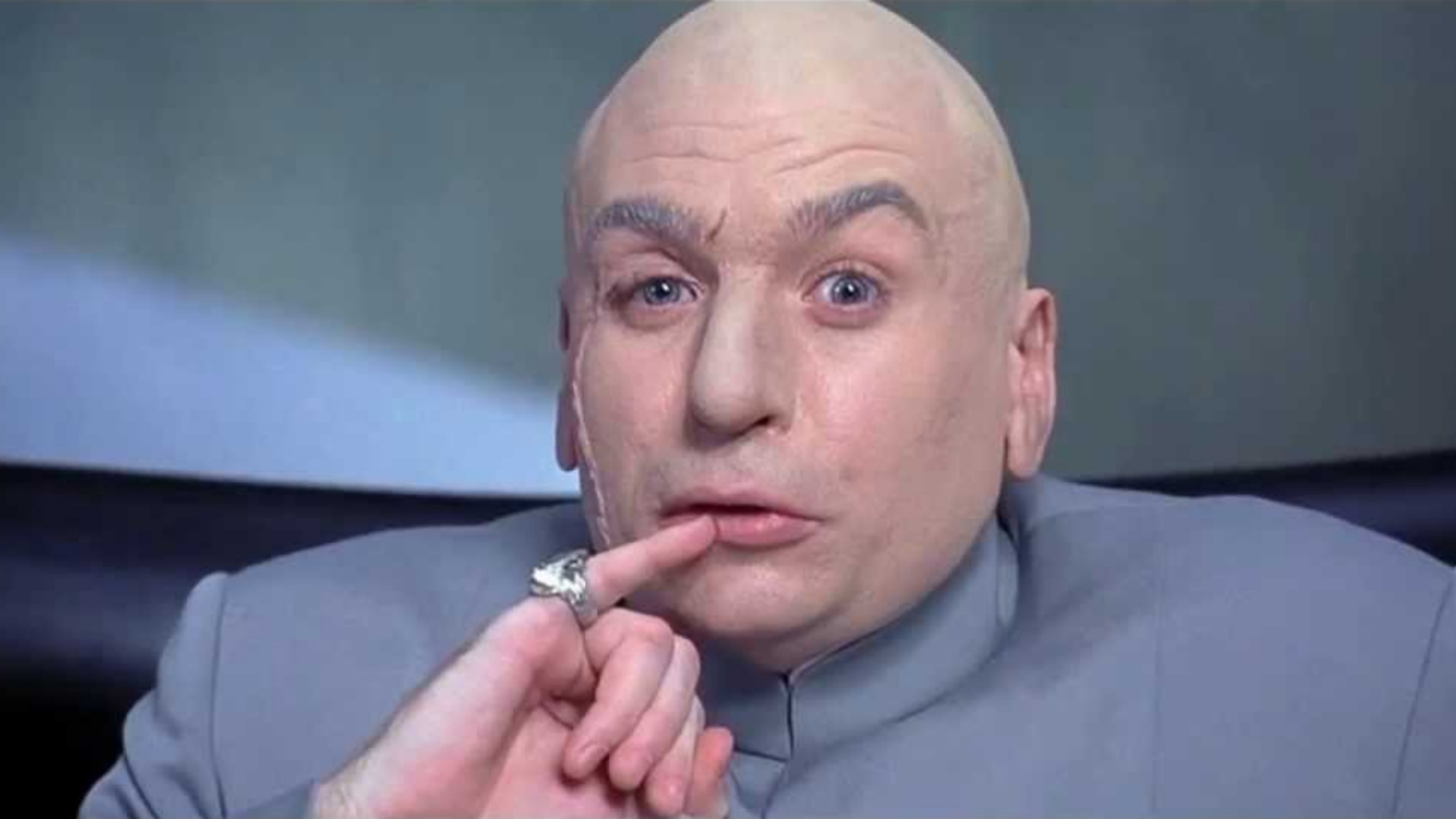
bitkoin

# Who are the "Next Billion Users" ?

CZEŚĆ
THE JOKER

Until now,
developing for the web =
developing for users like you

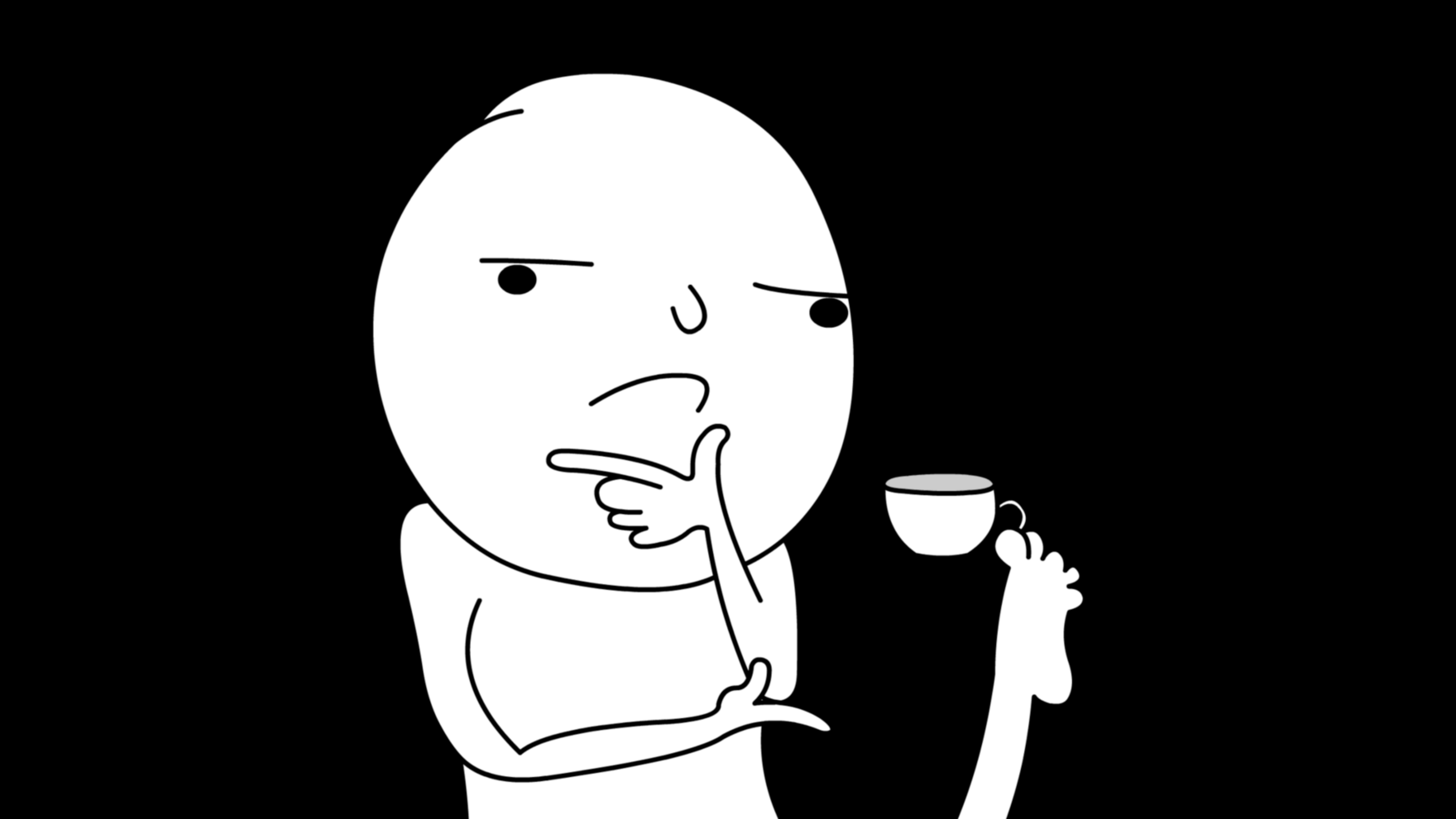
Until now,
developing for the web =
developing for users like you



In 1995,
The average cost of computers
was ~ USD 10,000

In 1995,
Only 0.41. of the global population
had access to the internet

In 1995,
Access to assistive technologies was
essentially non-existent



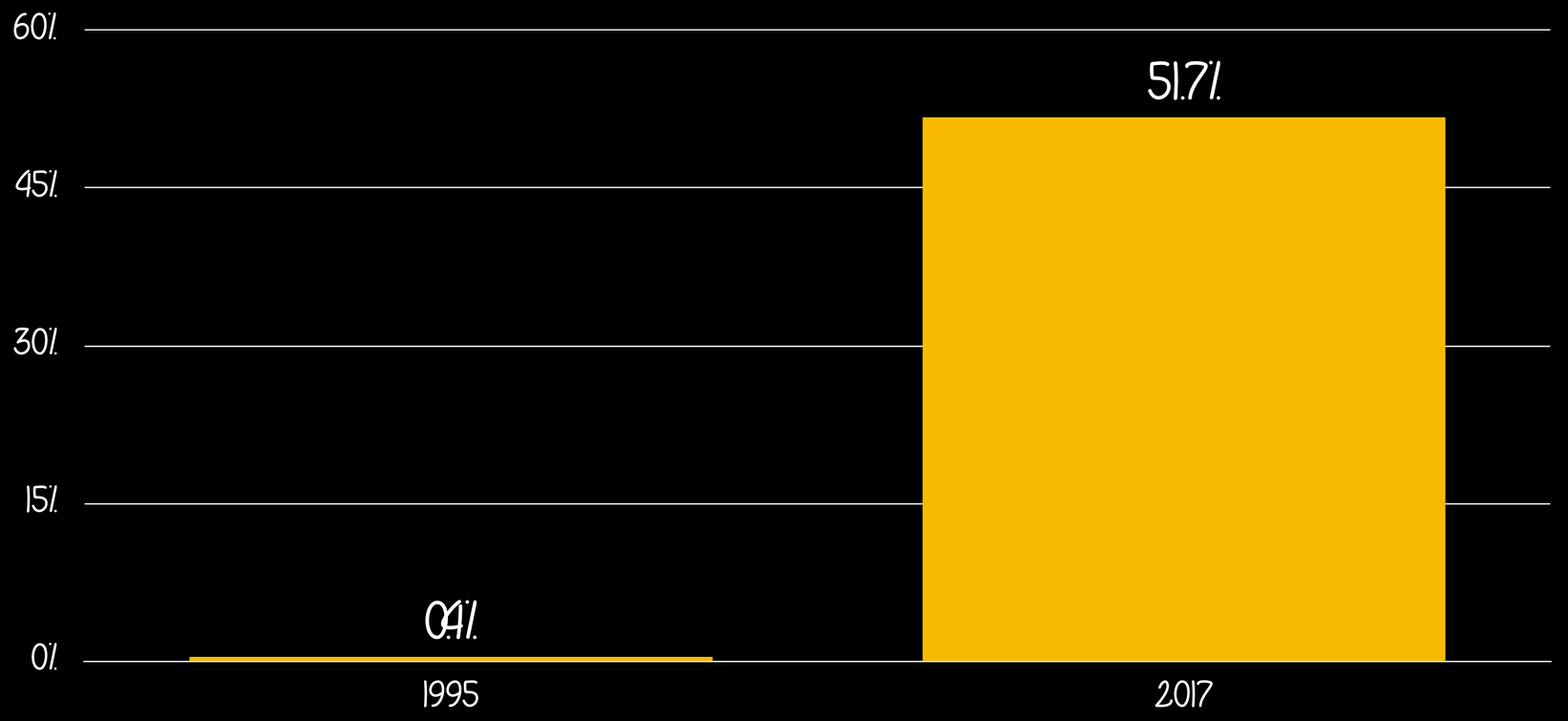
Techno W1
Android 7.0 Nougat

NGN 16,000 ~ USD 45

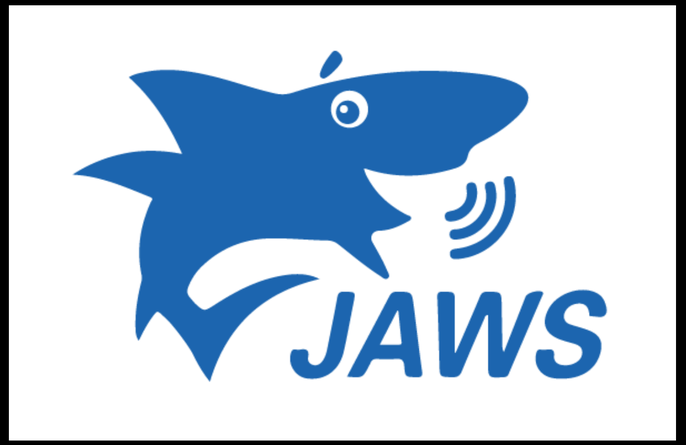
Lenovo Ideapad
Windows 10

NGN 90,000 ~ USD 250

# % of Global Population with Access to Internet



# Assistive Technologies



# Next Billion Users

...

Performance

...

Internationalisation

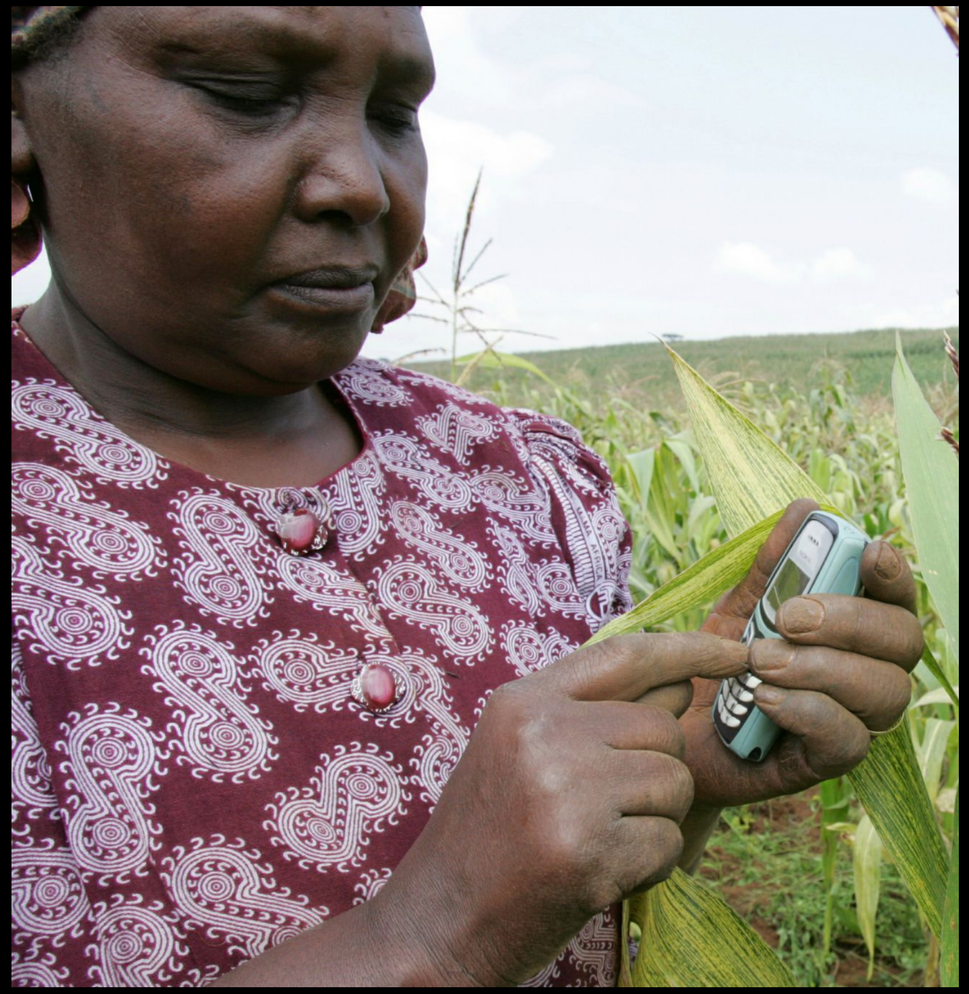
# Building for the NBU

...

Accessibility

...

# Performance



"In Nigeria, the average person has to work 28 hours to earn enough to use 500 MB of data.
In Germany, it's only 1 hour"

– 2014 report by McKinsey & Company

# Internationalisation

# Accessibility

# CSS for the Next Billion Users

# 4 things

- Is CSS the right tool?
- Selecting HTML
- CSS Declarations
- CSS Delivery

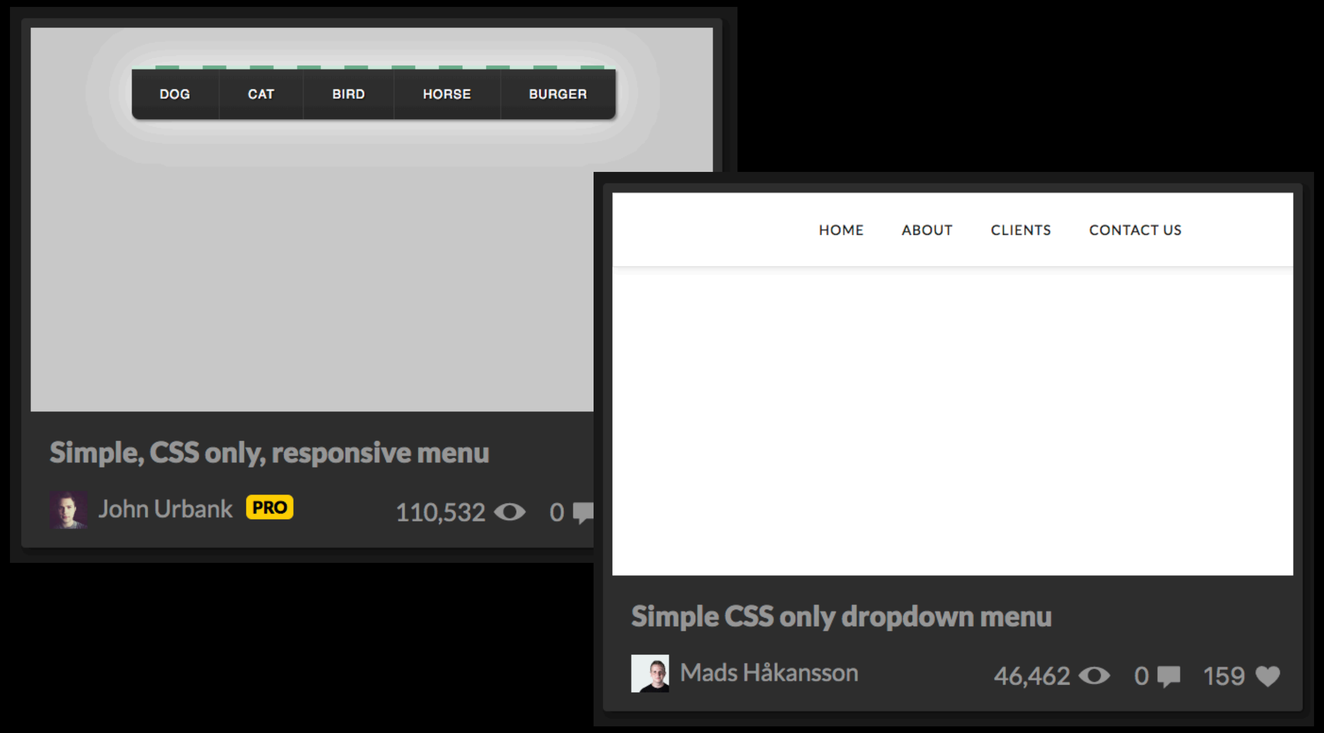
# ①

# Is CSS the right tool?

"If you only have a hammer, you tend to see every problem as a nail"

– A Wise Carpenter

# "CSS-Only" Functionality



# Use the Right Tool

Content Presentation Functionality

# When to use HTML

```
input[type=“password”]::after {

  content: “Enter your password”

}
```

# When to use HTML

```
<label for="password">Enter your password</
label>

<input type="password" id="password">
```

# When to use JavaScript

# When to use JavaScript

# 2

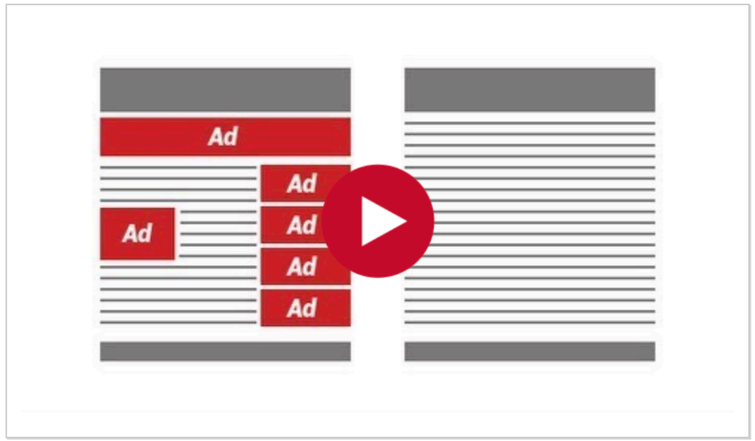
# Selecting HTML

```
.element {
    color: #bae;
}
```

Use globally-aware
naming conventions

ABP Adblock Plus

About Features Report an issue Contribute English (US)




# Adblock Plus

## Surf the web without annoying ads!

- ✓ Blocks banners, pop-ups, tracking, malware and more
- ✓ By default, nonintrusive ads aren't blocked in order to support websites (learn more) [1]
- ✓ **It's free for users and open source (GPLv3)**

By clicking the Agree and Install button below, you agree to our Terms of Use.

Agree and Install for Chrome

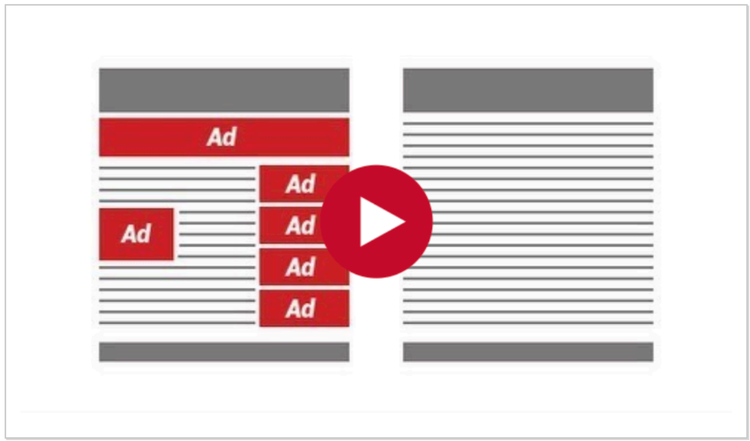
# مانع الإعلانات المطور

تصفح الإنترنت بدون إعلانات مزعجة!

- Blocks banners, pop-ups, tracking, malware and more
- الإعلانات الغير بارزة لم نمنعها من أجل دعم المواقع (قابل للتعديل) [1]
- انه مجاني ! (GPLv3)

.By clicking the Agree and Install button below, you agree to our Terms of Use

تثبيت لجوجل كروم



# Naming Conventions

```
.text-left {
    text-align: left;
}
```

# Naming Conventions

```
[dir="ltr"] .text-start {
    text-align: left;
}

[dir="rtl"] .text-start {
    text-align: right;
}
```

```
margin-block-start: 10px ; flex-direction: row | row-reverse | column | column-reverse ; flex-wrap: nowrap | wrap | wrap-reverse ; justify-content: flex-start | flex-end | center | space-between | space-around |space-evenly ; align-items: flex-start | flex-end | center | baseline | stretch;  align-content: flex-start | flex-end | center | space-between | space-around | stretch ; display: grid | inline-grid ; text-align: start ; align-content: center | start | end | space-between | space-around | space-evenly ; justify-items: center | start | end | stretch ; align-items: center | start | end | stretch ; justify-self: center | start | end | stretch ; align-self: center | start | end | stretch ;
```

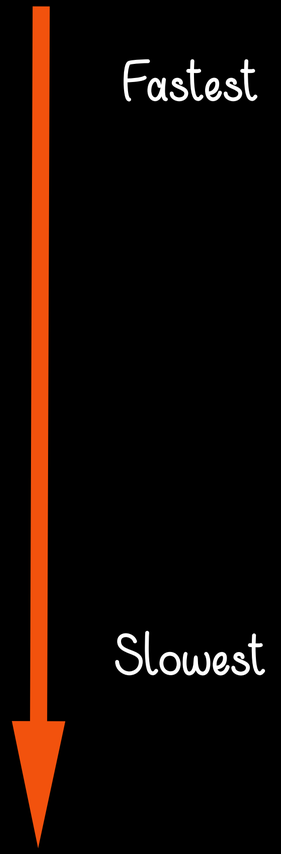
Beware of
expensive selectors

```
<ul>
    <li><a href="https://cssday.nl">One</a></li>
    <li><a href="https://cssday.nl/2018">Two</a></li>
    <li><a id="boc" href="https://bitsofco.de">Three</a></li>
</ul>
```

```
a[href=“https://bitsofco.de”]

a:not[href*=“cssday.nl”]

ul li:nth-child(3) a

ul li:last-child a

#boc
```

# Selector Efficiency

1. ID, e.g. `#foo`
2. Class, e.g. `.foo`
3. Tag, e.g. `div`
4. Adjacent Sibling, e.g. `header + main`
5. Child Combinator, e.g. `ul > li`
6. Descendant, e.g `ul li`
7. Universal, e.g. `*`
8. Attribute, e.g. `a[href="https://bitsofco.de"]`
9. Pseudo-classes & pseudo-elements, e.g. `a:visited`



```
#boc

ul li:nth-child(3) a

ul li:last-child a

a[href=“https://bitsofco.de”]

a:not[href*=“cssday.nl”]
```

# Use Performant Naming Conventions

```
<div class="button icon primary">

<div class="button primary">


button:not(.icon).primary { … }
```

# Use Performant Naming Conventions

```
<div class="button button--icon button--primary">

<div class="button button--primary">
```

```
.button { … }

.button--primary { … }
```

# 3

# CSS Declarations

```
.element {
    color: #bae;
}
```

Can I Use
[insert-awesome-thing] ?

Do I need to use [insert-awesome-thing] ?

**Item title**

Item description

# Grid

## 2-Column

| | |
|---|---|
| A (one half) | B (one half) |

## 3-Column

| | | |
|---|---|---|
| A (one third) | B (one third) | C (one third) |
| D (two thirds) | | E (one third) |

## 4-Column

| | | | |
|---|---|---|---|
| A (one fourth) | B (one fourth) | C (one fourth) | D (one fourth) |
| E (three fourths) | | | F (one fourth) |

## Reversed

# Float-Based Layout

```
.row {
  margin: 0px (-$small-space);
}


.row:after {
  display: block;
  clear: both;
  content: "";
}
```

```
.column {
  position: relative;
  width: 100%;
  min-height: 1px;
  padding: 0px $small-space;
}


.column,
[dir="rtl"] .reverse .column {
  float: left;
}
```

# Float-Based Layout

It just works TM

```
.row {
  margin: 0px (-$small-space);
}


.row:after {
  display: block;
  clear: both;
  content: "";
}
```

```
.column {
  position: relative;
  width: 100%;
  min-height: 1px;
  padding: 0px $small-space;
}


.column,
[dir="rtl"] .reverse .column {
  float: left;
}
```

Do I need to use
[insert-awesome-thing] ?
Actually, yes.

## WHO BENEFITS FROM ACCEPTABLE ADS?

### PUBLISHERS

Increase your revenue

LEARN MORE

GET WHITELISTED

### AD NETWORKS

Monetize your audience

LEARN MORE

GET WHITELISTED

### ADVERTISERS

Extend your reach

LEARN MORE

GET WHITELISTED

### AD-TECH SUPPLIERS

Opportunities for growth

LEARN MORE

GET WHITELISTED

### USERS

Support the free and open web

LEARN MORE

GET WHITELISTED

# Grid-Based Layout

```
.group.cards {

    display: grid;

    grid-template-columns: repeat(1, 1fr);



    @media (min-width: $card-min-width) {

      grid-template-columns: repeat(auto-fit, minmax($card-min-width,
1fr));

    }

}
```

## CSS Grid Layout

Method of using a grid concept to lay out content, providing a mechanism for authors to divide available space for layout into columns and rows using a set of predictable sizing behaviors. Includes support for all `grid-*` properties and the `fr` unit.

| IE | Edge | Firefox | Chrome | Safari | Opera | iOS Safari | Opera Mini | Android Browser | Chrome for Android |
|---|---|---|---|---|---|---|---|---|---|
| 9 | 14 | 56 | 62 | 10 | 48 | 10.2 | | 4.4 | |
| 10 | 15 | 57 | 63 | 10.1 | 49 | 10.3 | | 4.4.4 | |
| 11 | 16 | 58 | 64 | 11 | 50 | 11.2 | all | 62 | 64 |
| | 17 | 59 | 65 | 11.1 | 51 | 11.3 | | | |

✓ ✗ Partial Support Prefixed

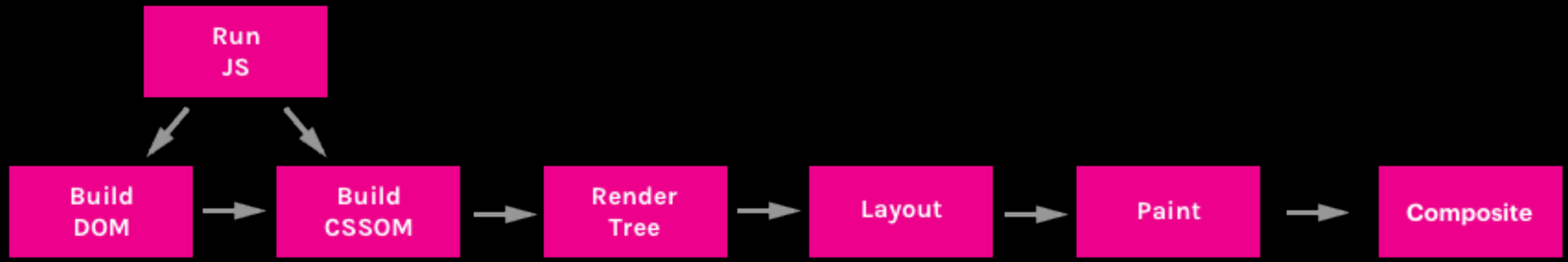
**Global:** 82.8% + 3.79% = 86.59%

Use feature queries!

```
.group.cards {

    /* Fallback styles here */

}


@supports (display: grid) {

  .group.cards {

    /* grid-based layout */

  }

}
```

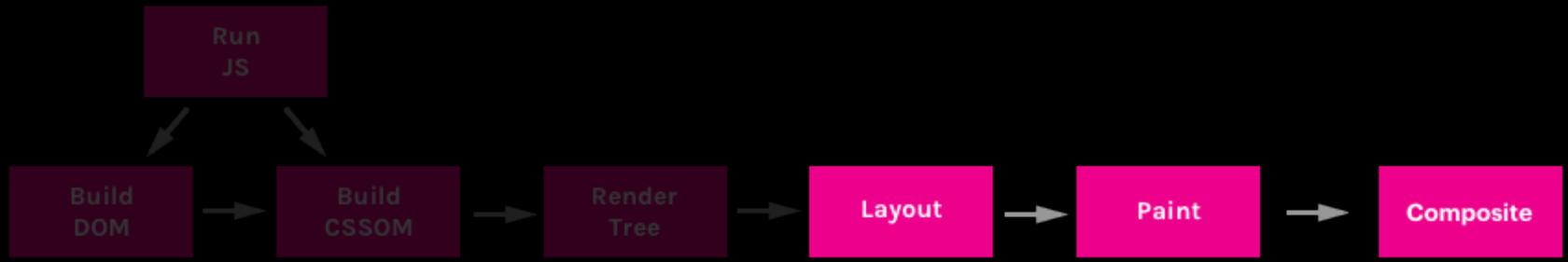
# Choosing performant CSS properties

# The "Critical Rendering Path"

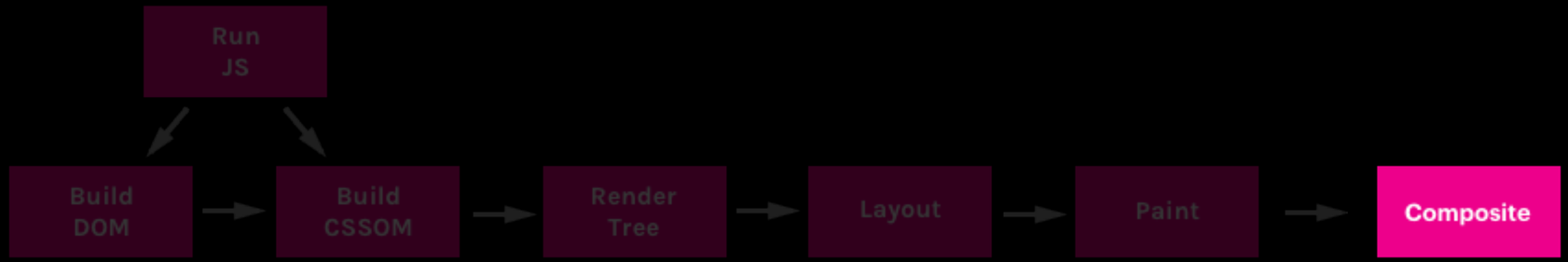


Changes to CSS can re-trigger stages of the critical rendering path

# Animating the "top" property

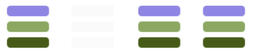
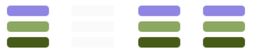
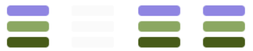
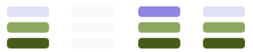


# Animating the "transform" property



CSS Triggers

Layout Paint Composite

| | Change from default | | | | Subsequent updates | | | |
|---|---|---|---|---|---|---|---|---|
| | Blink | Gecko | WebKit | EdgeHTML | Blink | Gecko | WebKit | EdgeHTML |
| align-content | | | | |  | | | |
| align-items | | | | |  | | | |
| align-self | | | | |  | | | |
| backface-visibility | | | | |  | | | |
| background-attachment | | | | | | | | |
| background-blend-mode | | | | | | | | |
| background-clip | | | | | | | | |
| background-color | | | | | | | | |
| background-image | | | | | | | | |
| background-origin | | | | |  | | | |

# Respect end-user preferences

# Reduced-motion

```
.animated {
    animation-name: 3s infinite alternate slideIn;
}


@media (prefers-reduced-motion: reduce) {
    .animated { animation: none; }
}
```

# !important

```
body {

    font-size: 8px !important;

}
```

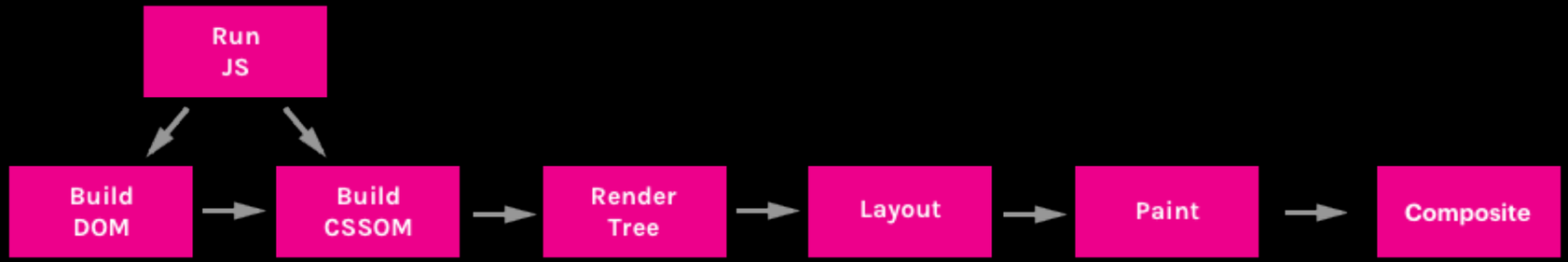
Our !important declarations will override everything except user-defined !important declarations

# Progressive Enhancement

```
div {

    background-color: rgb(0,0,0);

    background-color: rgba(0,0,0,0.5);

}
```

# 4

# CSS Delivery


Run
JS
Build
DOM
Build
CSSOM
Render
Tree
Layout
Paint
Composite

CSS is a
render-blocking resource

# Solutions

Modularising CSS

Preloading CSS

# Modularising CSS

1. Loading CSS based on media types
2. Inlining Critical CSS
3. Styles in the <body>

```
<link
rel="stylesheet"
media="(max-width: 600px)"
src="mobile.css">

<link
rel="stylesheet"
media="(min-width: 600px)"
src="desktop.css">
```

1. Loading CSS based on media types
2. Inlining Critical CSS
3. Styles in the <body>

```
<head>
  <style id="critical">
    #hero { }
  </style>
  <script>
    loadCSS("full.css");
  </script>
</head>
```

1. Loading CSS based on media types
2. Inlining Critical CSS
3. Styles in the <body>

```
<body>
   <style>header { /* */ }</style>
  <header>…</header>

  <style>main { /* */ }</style>
  <main>…</main>


  <style>footer { /* */ }</style>
  <footer>…</footer>
</body>
```

1. Loading CSS based on media types
2. Inlining Critical CSS
3. Styles in the <body>

```
<body>
   <style>header { /* */ }</style>
  <header>…</header>

  <style>main { /* */ }</style>
  <main>…</main>


  <style>footer { /* */ }</style>
  <footer>…</footer>
</body>
```

1. Loading CSS based on media types
2. Inlining Critical CSS
3. Styles in the <body>

**The use of <style> in the <body> of the document may cause restyling, trigger layout and/or cause repainting, and hence, should be used with care.” — HTML Specification**

1. Preload Link
2. HTTP/2 Push

# Preloading CSS

1. Preload Link
2. HTTP/2 Push

```
<link rel="preload" as "style"
href="stylesheet.css">
```

1. Preload Link
2. HTTP/2 Push

```
<FilesMatch "\.html$">
    Header set Link “</css/styles.css>;
rel=preload; as=style"
<FilesMatch>
```

# Let's Review

- ✅ Is CSS the right tool?
- ✅ Selecting HTML
- ✅ CSS Declarations
- ✅ CSS Delivery

~~Next~~ Billion Users

# Your Billion Users

# Thank you!

ireaderinokun.com

bitsofco.de

@IreAderinokun