Aaron Gustafson presents

Solving CSS Problems with eCSStender

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Where in the world is CSS3?

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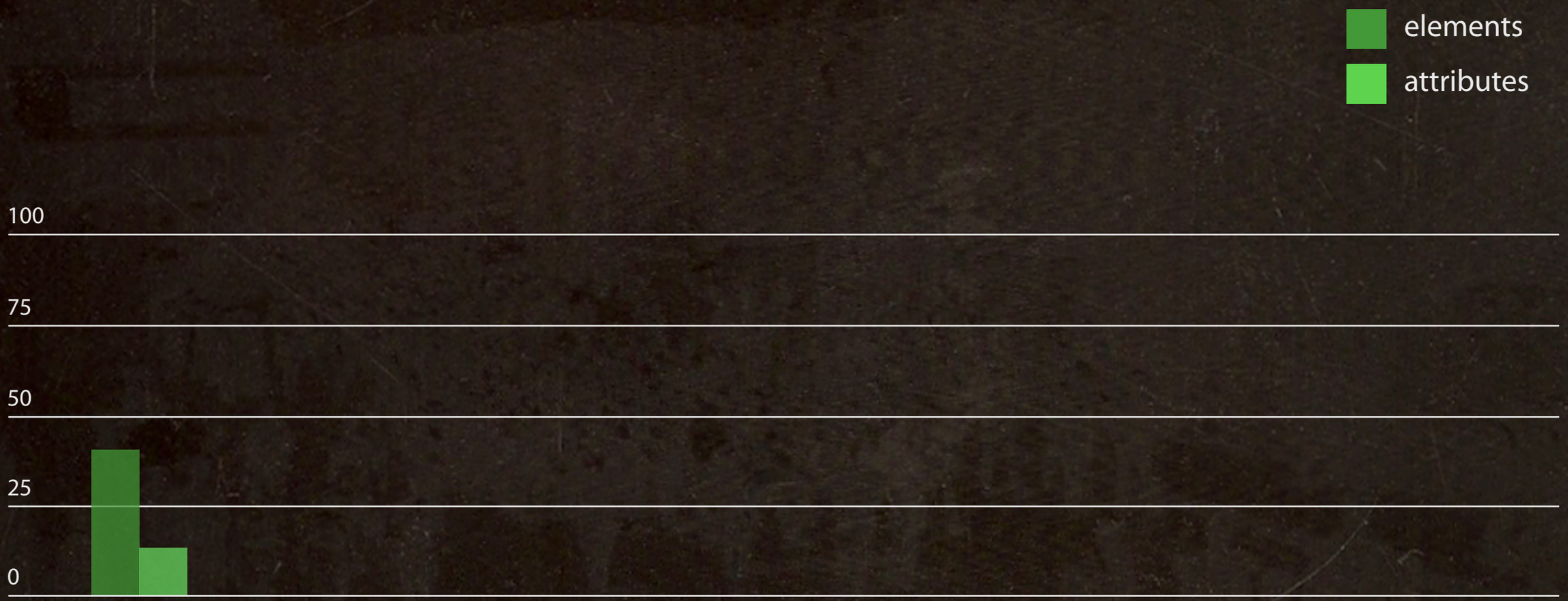
Progress



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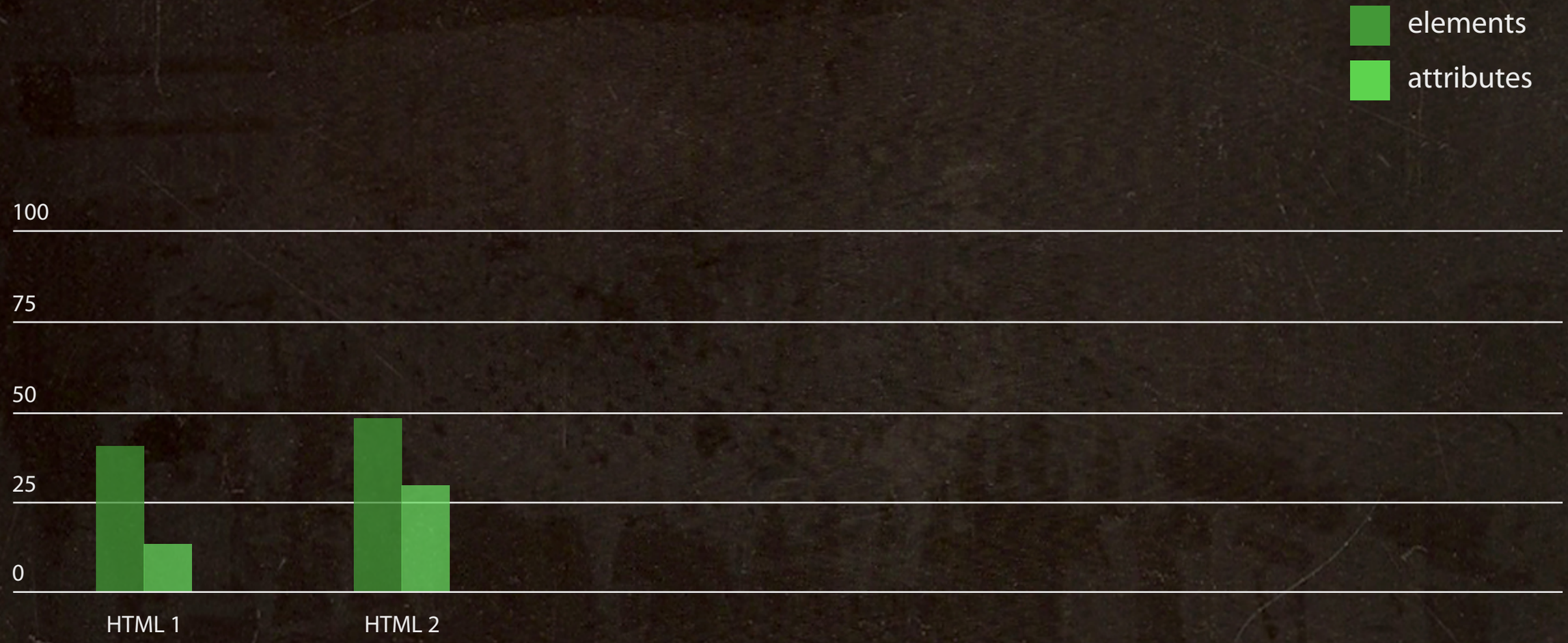

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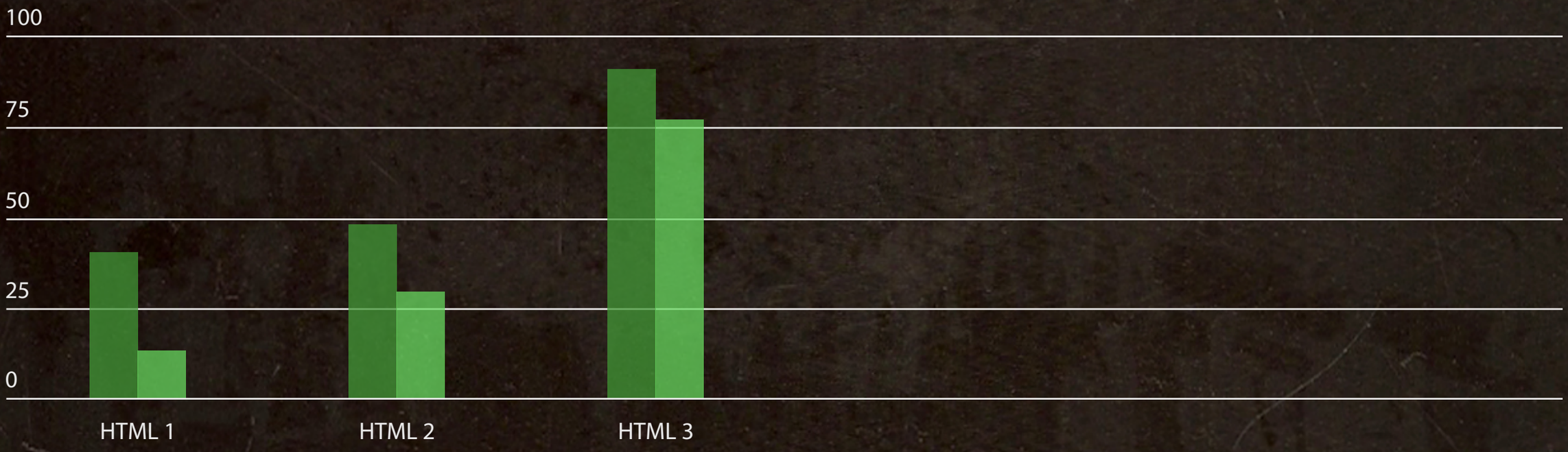

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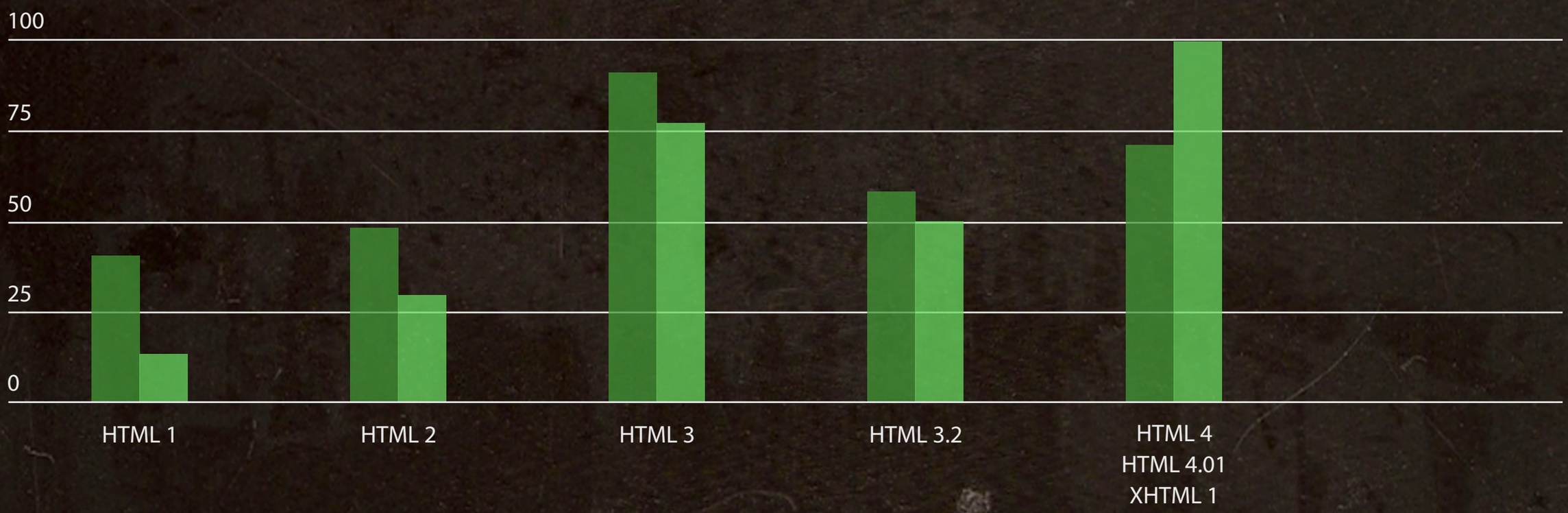

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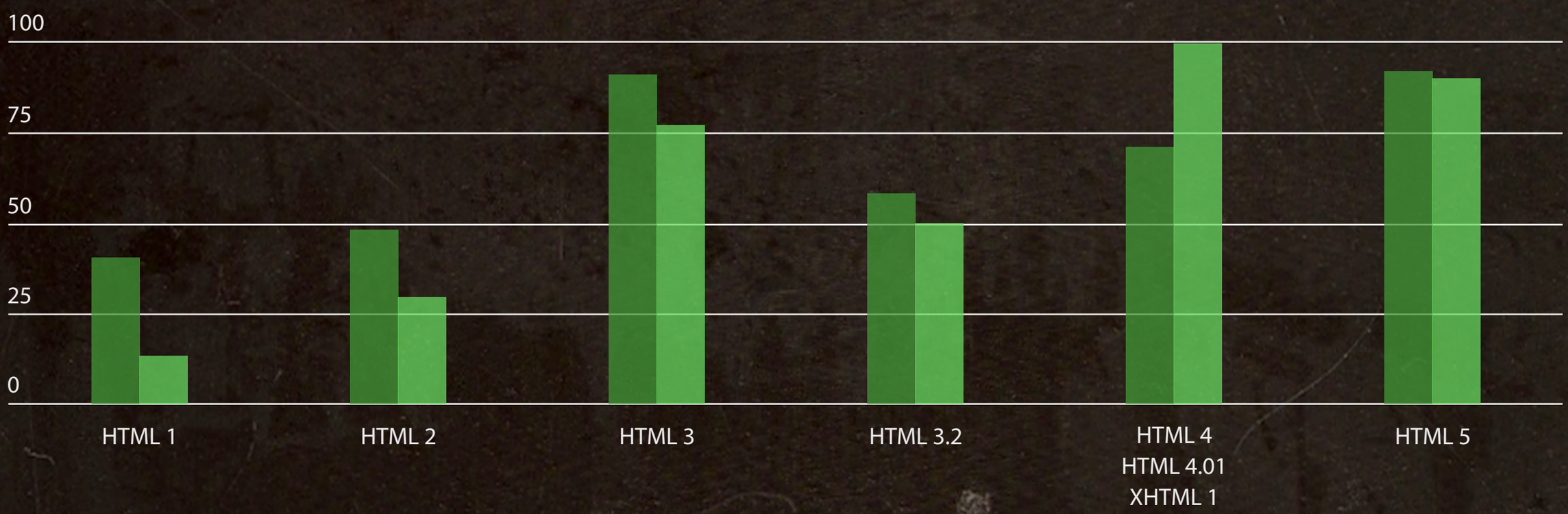

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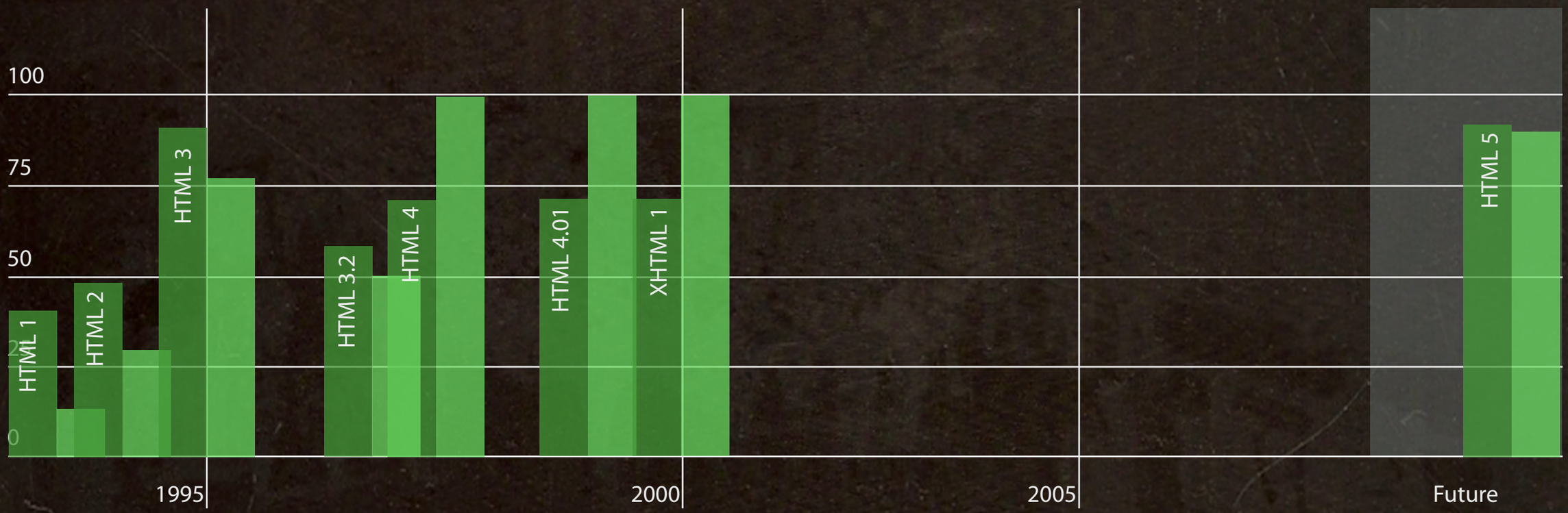
Progress?



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CSS 2.1 became a candidate recommendation last month

Some modules of CSS3 have been in development since 1999

Where does CSS come from?

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Officially?

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Officially?

Semi-officially

Microsoft®

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Officially?

Semi-officially

-moz-

-webkit-

Microsoft®

-ms-

-o-

Browsers “extend” CSS

opacity

border-radius

column-count

Browsers “extend” CSS

-moz-opacity

-moz-border-radius
-webkit-border-radius
-khtml-border-radius

-moz-column-count

Browsers “extend” CSS

```
#foo {
  border-radius: 3px;
}
```

Browsers “extend” CSS

```
#foo {
  -moz-border-radius: 3px;
  -webkit-border-radius: 3px;
  -o-border-radius: 3px;
  -khtml-border-radius: 3px;
}
```

Browsers “extend” CSS

```
#foo {
  border-radius: 10px 5px;
}
```

Browsers “extend” CSS

```
#foo {
  -moz-border-radius: 10px 5px;
  -webkit-border-top-left-radius: 10px;
  -webkit-border-top-right-radius: 5px;
  -webkit-border-bottom-right-radius: 10px;
  -webkit-border-bottom-left-radius: 10px;
  -o-border-radius: 10px 5px;
  -khtml-border-top-left-radius: 10px;
  -khtml-border-top-right-radius: 5px;
  -khtml-border-bottom-right-radius: 10px;
  -khtml-border-bottom-left-radius: 10px;
}
```

Browsers “extend” CSS

```
#foo {
  padding: 10px;
  width: 200px;
  w\idth: 180px;
  height: 200px;
  heigh\t: 180px;
}

/* or */

#foo {
  padding: 10px;
  width: 200px;
  height: 200px;
}
* html #foo {
  width: 180px;
  height: 180px;
}
```

Can we play too?

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First Experiment: 2005

```
#content:before {
  -gfss-source: url(spiral.swf);
  -gfss-background-color: #000;
  -gfss-flash-version: 6;
  -gfss-quality: high;
  -gfss-flash-vars: "foo=bar&bar=foo";
  -gfss-width: 50;
  -gfss-height: 50;
  position: absolute;
  top: 0;
  left: 0;
}
```

First Experiment: 2005

3 years later…

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{+} ecsstender

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Fast facts

- It's pronounced "extender"
- A small JS library (<16K minified) for interfacing with CSS
- Is library agnostic (plays well with anyone)
- MIT License
- Enables both
  - the creation of CSS extensions to push the boundaries of the language (experimentally or practically), and
  - the patching of old/outdated browsers to the latest standards
- Allows designers to include extensions in their site and have their CSS **Just Work**.

Fast facts

- It's media aware (including `@media`)
- It can handle both linked and imported CSS (nesting too)
- It understands concepts like `@font-face` and `@page`
- It runs on DOM ready (undetectably in many cases)
- Its CSS parser functions much like a browser's, paying attention to the two key concepts:
  - Specificity
  - Cascade
- It supports local storage (`window.localStorage` and IE's `UserData`) for client-side caching

How does it work?

```
eCSStender.register(
  { selector: 'h1' },
  '*',
  function( selector, properties, media, specificity ){
    // do something
});
```

How does it work?

```
eCSStender.register(
  { selector: 'h1' },
  '*',
  function( selector, properties, media, specificity ){
    // do something
});
```

extension registration

How does it work?

```
eCSStender.register(
  { selector: 'h1' },
  '*',
  function( selector, properties, media, specificity ){
    // do something
});
```

define the extension

How does it work?

```
eCSStender.register(
  { selector: 'h1' },
  '*',
  function( selector, properties, media, specificity ){
    // do something
});
```

property request

How does it work?

```
eCSStender.register(
  { selector: 'h1' },
  '*',
  function( selector, properties, media, specificity ){
    // do something
});
```

callback function

In prose

- Search for a selector containing “h1”
- Collect every property set on it
- Send each selector, its properties, media type and specificity to my function so I can do something with it.

```
eCSStender.register(
  { selector: 'h1' },
  '*',
  function( selector, properties, media, specificity ){
    // do something
  });
```

Do you want to see something cool?

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```
#sidebar {
  width: 30%;
  float: right;
  position: relative;
  transform-origin: 0 0;
  transform: rotate(-15);
}
```

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eCSStender Example: transform: rotate()

Easy!%20Designs,%20LLC/Projects/Code/eCSStender.js/examples/transform.html

Google

Clients ▾ Easy! Stuff ▾ Personal ▾ Localhost ▾ Favelets ▾ Resources ▾ CSS3 Selectors Module CSS Stuff Bikes Clever PNG ...ng Magazine

eCSStender Example: transform: r...

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eCSStender Example: transform: rotate()

file:///Users/aaron/Easy! Designs, LLC/Projects/Code/eCSStender.js/

Clients | Easy! Stuff | Personal | Localhost | Favelets | Resources | CSS3 Selectors Mo... | CSS Stuff | Bikes | Clever PNG Optimiza... | Green Power Switch

Addresses | Contacts | Events | Locations | Tagspaces | Bookmarks | Resources | Options

eCSStender Example: transfor...

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Done

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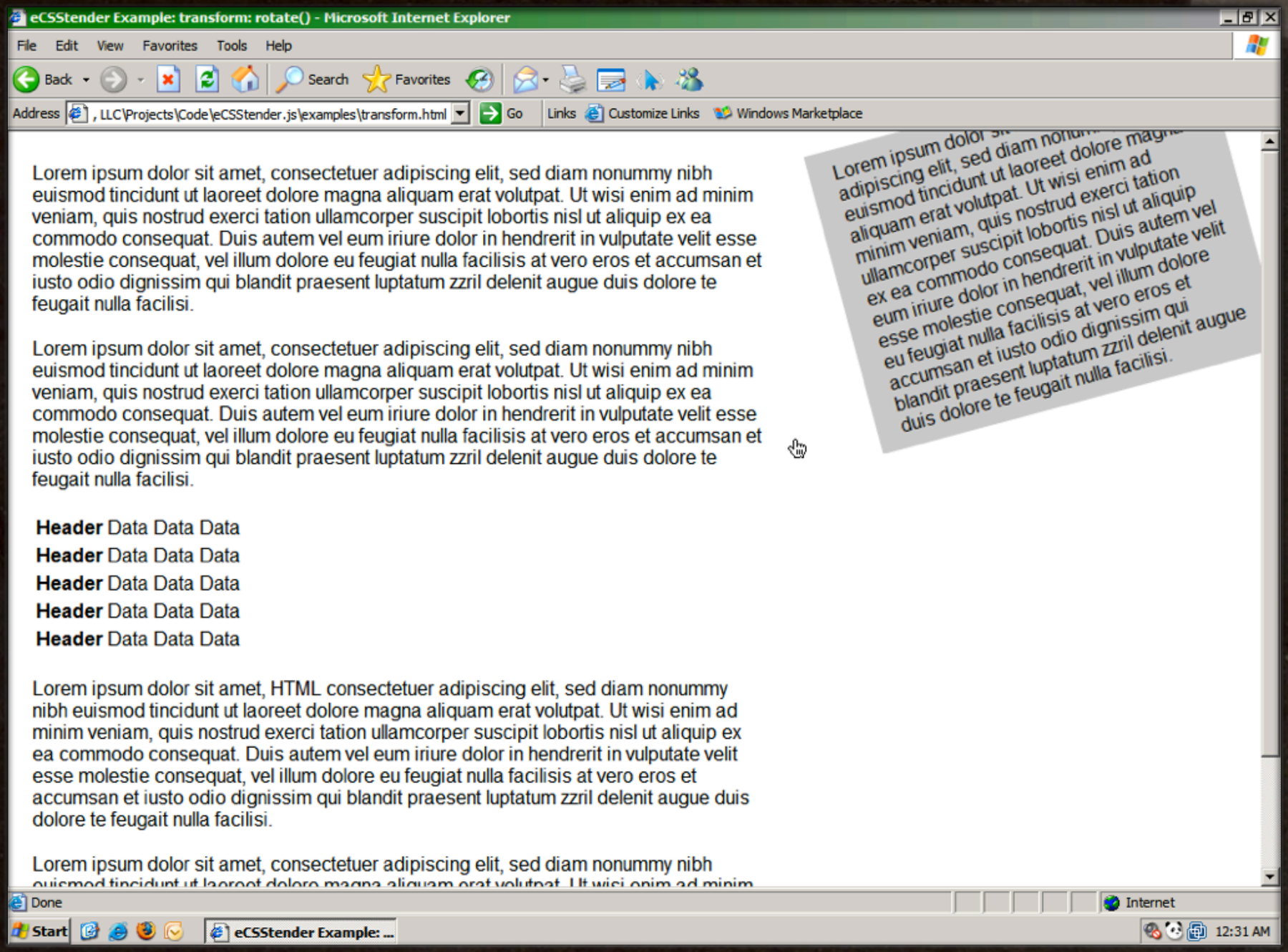
eCSStender Example: transform: rotate() - Microsoft Internet Explorer
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Done
Internet
Start
eCSStender Example: ...
12:31 AM

Finding what you want

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The definition

- Requires a lookup method
  - `selector`
    - simple selector string: `{ selector: 'h1' }`
    - compound selector string: `{ selector: 'h1, h2' }`
    - regular expression: `{ selector: /\s*h1\s*/ }`
    - array of any of the above: `{ selector: [ 'h1', /\s*h1\s*/ ] }`
    - a selector function:

```
{
  selector: function(){
    return ( this.match(/\s*h1\s*/) !== null );
  }
}
```

The definition

- Requires a lookup method
  - `property`
    - simple string: `{ property: 'border-radius' }`
    - array of strings: `{ property: [ 'border-radius' ] }`
  - `fragment` `{ fragment: 'radius' }`
  - `prefix` `{ prefix: 'moz' }`

The definition

- Can be
  - media-restricted:

```
{
  selector: 'h1',
  media: 'screen, projection'
}
```

  - filtered by property name or value:

```
{
  property: 'transform',
  filter: {
    value: /rotate\(-?\d+?\)/
  }
}
```

The definition

- Can be
  - fingerprinted:

```
{
  fragment:    'radius',
  fingerprint: 'net.easy-designs.border-radius'
}
```

Getting what you want

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Properties, please.

- eCSStender tries to be smart about properties you want
  - property-based lookups (property, fragment, prefix) **always** return the matching properties, allowing you to supply `false` as the second argument of `register()`

```
eCSStender.register(
  {
    fragment:    'radius',
    fingerprint: 'net.easy-designs.border-radius'
  },
  false,
  function(){});
```

Properties, please.

- You can still specify what you want though
  - Get every property on the matching element using "*"

```
eCSStender.register(
 { selector: 'h1' },
 '*',
 function(){});
```

  - or you can specify the properties you want using a string:

```
eCSStender.register(
 { selector: 'h1' },
 'color',
 function(){});
```

or

```
eCSStender.register(
 { selector: 'h1' },
 ['color','visibility'],
 function(){});
```

Doing something with what you find

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The callback

- When matches are found, your callback function is run
- eCSStender supplies your callback function with the following four arguments (in order)
  - **selector** - the selector that was matched
  - **properties** - a hash of the desired properties from a match
  - **medium** - the medium in which the match was found
  - **specificity** - a sum-total of the selector's specificity

The callback

```
eCSStender.register(
 { selector: 'h1' },
 '*',
 function( selector, properties, medium, specificity ){

   alert( 'my extension found ' + selector );

   if ( typeof properties['color'] != 'undefined' )
   {
     alert ( 'this h1 has a color!' );
   }

   alert( 'the medium is ' + medium );

   alert( 'it has a specificity of ' + specificity );

 });
```

Testing Testing 1-2-3

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It's wishful thinking...

- but what happens when browsers start doing things correctly?
- eCSStender helps you prepare by supporting robust testing for selector and property support: `eCSStender.isSupported()`
  - test for property support*:

```
eCSStender.isSupported( 'property',
                        'border-top-left-radius: 3px' );
```

It's wishful thinking...

- but what happens when browsers start doing things correctly?
- eCSStender helps you prepare by supporting robust testing for selector and property support: `eCSStender.isSupported()`
  - test for property support*:

```
eCSStender.isSupported( 'property',
                        'border-top-left-radius: 3px' );
```

* pay attention to how browsers store values!

It's wishful thinking...

- but what happens when browsers start doing things correctly?
- eCSStender helps you prepare by supporting robust testing for selector and property support: `eCSStender.isSupported()`
  - test for selector support:

```
var
div  = document.createElement('div'),
p    = document.createElement('p'),
p2   = p.cloneNode(true);
div.appendChild( p ); div.appendChild( p2 );
eCSStender.isSupported( 'selector', 'div p ~ p',
                        div, p2 );
```

html context

element that this should select

Where to test

- Testing can be useful in many places
  - The `test` property of your extension definition (`true` == run):

```
eCSStender.register(
  { selector: /:empty/,
    test:     function(){
      var
      div  = document.createElement('div'),
      p    = document.createElement('p');
      div.appendChild( p );
      return ( ! eCSStender.isSupported(
        'selector', 'div p:empty', div, p ) );
    }
},
...
```

Where to test

- Testing can be useful in many places
  - Within your callback function:

```
eCSStender.register( ... function( ... ){ ...
    if ( ( eCSStender.isSupported( 'selector',
            'p:nth-child(odd)', div, p ) &&
          ! eCSStender.isSupported( 'selector',
            'p:nth-child(2n+1)', div, p ) &&
        selector.match(
          /:nth-child\(\s*(?:even|odd)\s*\)/ ) != null )
       || eCSStender.isSupported( 'selector',
            'p:nth-child(2n+1)', div, p ) ){
      // support is incomplete, but fixable
    } else {
      // we need to compensate for no support
    }
});
```

Helpers

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Working with styles

- Basic premise in eCSStender: applying inline style sucks and should be avoided because it
  - has the greatest specificity
  - runs roughshod over the cascade

Working with styles

- eCSStender encourages other methods of style application:
  - `eCSStender.embedCSS()`
    - takes 2 arguments: the styles to apply and (optionally) the medium to which to apply them

```
var styles = 'h1 { color: red; } h2 { color: pink; }';
eCSStender.embedCSS( styles );
```

or

```
var styles = 'h1 { color: red; } h2 { color: pink; }';
eCSStender.embedCSS( styles, 'screen' );
```

Working with styles

- eCSStender encourages other methods of style application:
  - `eCSStender.newStyleElement()`
    - allows for the creation of your own embedded stylesheet
    - takes two optional string arguments: the medium and `id` to apply
    - returns a reference to the `style` element
  - `eCSStender.addRules()`
    - takes two arguments: the `style` element and the styles to add

```
var myCSS = eCSStender.newStyleElement(),
styles = 'h1 { color: red; } h2 { color: pink; }';
eCSStender.addRules( myCSS, styles );
```

Working with styles

- Sometimes, however, you can't avoid applying inline style, so eCSStender tries to make it better
- `eCSStender.applyWeightedStyle()` takes 3 arguments:
  - a reference to the element
  - an JSON object containing the properties to apply
  - the specificity with which to apply them
  - keeps track of the specificity with which each property is applied in order to facilitate smarter inline style application

Working with styles

- Sometimes, however, you can't avoid applying inline style, so eCSStender tries to make it better

```
eCSStender.applyWeightedStyle( el,
  { 'visibility': 'hidden' }, 10 );  // el is hidden

eCSStender.applyWeightedStyle( el,
  { 'visibility': 'visible' }, 1 );  // el is still hidden

eCSStender.applyWeightedStyle( el,
  { 'visibility': 'visible' }, 10 ); // el is visible

eCSStender.applyWeightedStyle( el,
  { 'visibility': 'hidden' }, 100 ); // el is hidden again
```

Fonts and pages

- eCSStender exposes various "@" rules, including
  - `@font-face` as an object in the `eCSStender.fonts` array

CSS:

```
@font-face {
   font-family: 'Comfortaa';
   font-weight: normal;
   src: url('/fonts/Comfortaa_Regular');
}
```

`eCSStender.fonts`:

```
[ { 'font-family': 'Comfortaa',
    'font-weight': 'normal',
      src:          "url('/fonts/Comfortaa_Regular')" } ]
```

Fonts and pages

- eCSStender exposes various "@" rules, including
  - `@page` as a property of the `eCSStender.pages` object

CSS:

```
@page {
  margin: 3cm;
}
@page :right {
  margin-left: 5cm;
}
```

`eCSStender.pages`:

```
{
  all: { margin: '3cm' },
  right: { 'margin-left': '5cm' }
}
```

Performance

- eCSStender tries to be smart about which stylesheets it pays attention to and which it doesn't
  - foreign stylesheets are always ignored
  - you can tell eCSStender to ignore specific on-site stylesheets

```
eCSStender.ignore('foo.css');
eCSStender.ignore(['foo.css', 'bar.css']);
```

- eCSStender will attempt to cache extensions and the rules they apply to automatically, but you can disable that

```
eCSStender.disableCache();
```

Advanced eCSStender

- Use `eCSStender.lookup()` to gain introspection into the stylesheets from your callback function
  - lookup by selector, property, fragment or prefix
  - restrict results by medium and/or specificity

```
matches = eCSStender.lookup(
  {
    selector:    'h1',
    specificity: 0     // max specificity
  },
  '*'
); // matches.length === 0
```

Advanced eCSStender

- Use `eCSStender.lookup()` to gain introspection into the stylesheets from your callback function
  - lookup by selector, property, fragment or prefix
  - restrict results by medium and/or specificity

```
matches = eCSStender.lookup(
  {
    selector:    'h1',
    specificity: { min: 0, max: 2 }
  },
  '*'
);
```

Advanced eCSStender

- Use `eCSStender.lookup()` to gain introspection into the stylesheets from your callback function
  - lookup by selector, property, fragment or prefix
  - restrict results by medium and/or specificity
  - returns an array of style objects:

```
[ { medium:      'all'
    selector:    'h1',
    specificity: 1
    properties:  { color: 'red' }
  }, ... ]
```

Advanced eCSStender

- Create new eCSStender methods

```
eCSStender.addMethod('myMethod',function(){
  alert('hello');
});
eCSStender.methods.myMethod();
eCSStender.methods['myMethod']();
```

- Supply custom functions to be run when eCSStender finishes

```
eCSStender.onComplete(function({
  alert('eCSStender is finished processing!');
});
```

Let's make an extension

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Solving CSS Problems with eCSStender

by Aaron Gustafson

Slides available at
http://slideshare.net/AaronGustafson

eCSStender
http://eCSStender.org

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