

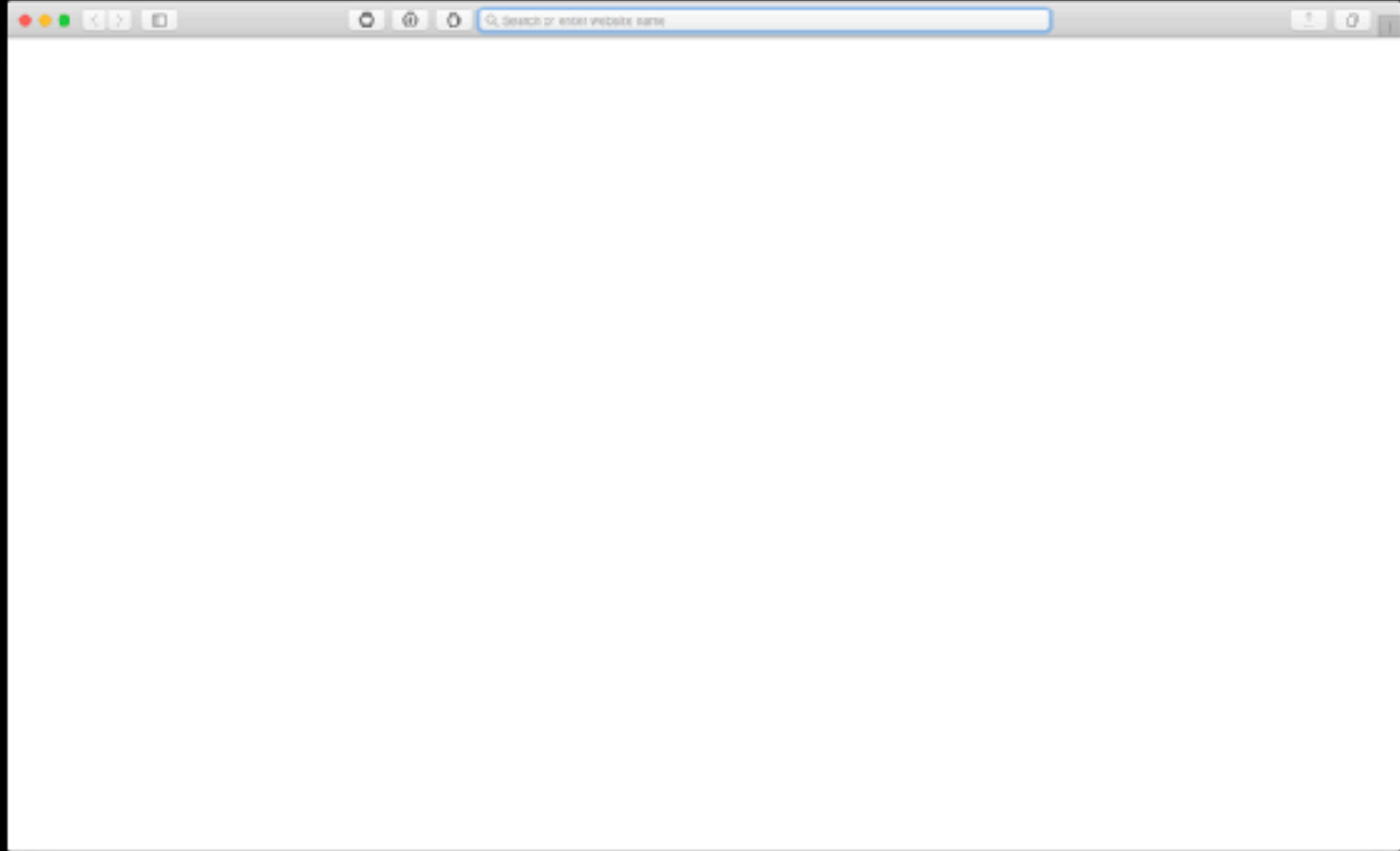
# CS50 for MBAs

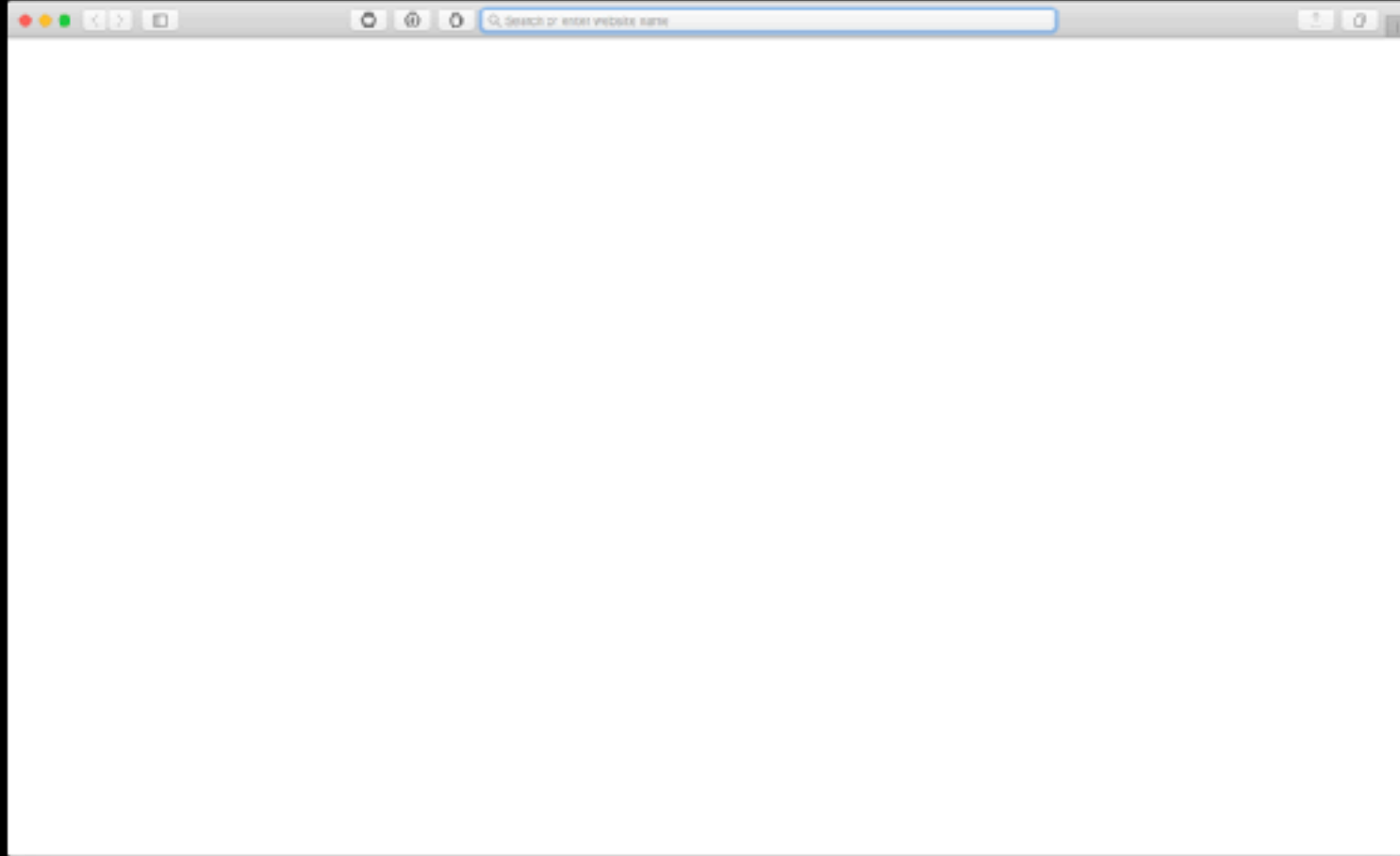
Web Programming

# Today

- Backend vs. Frontend
- Javascript
- APIs

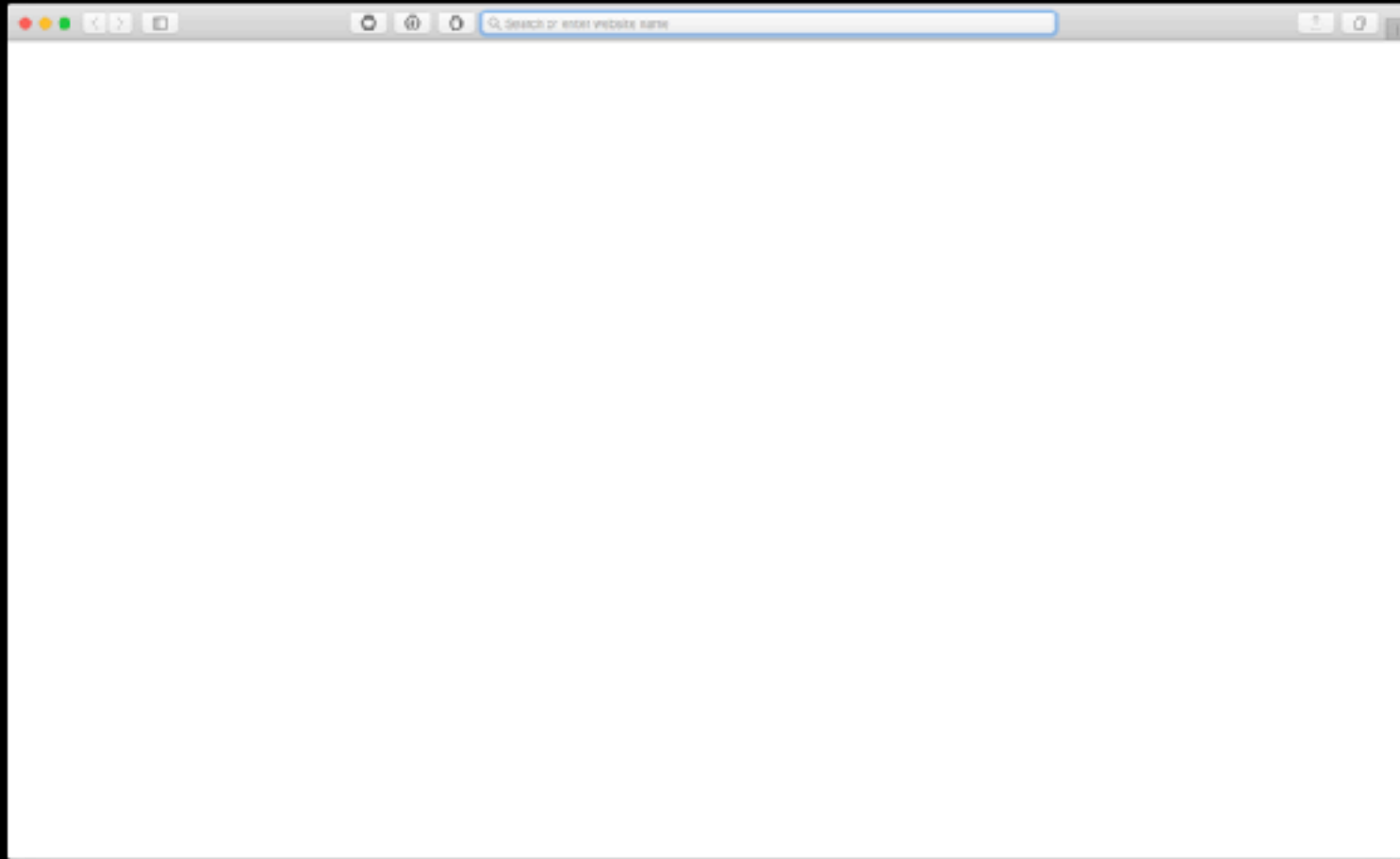
Backend vs. Frontend





Request

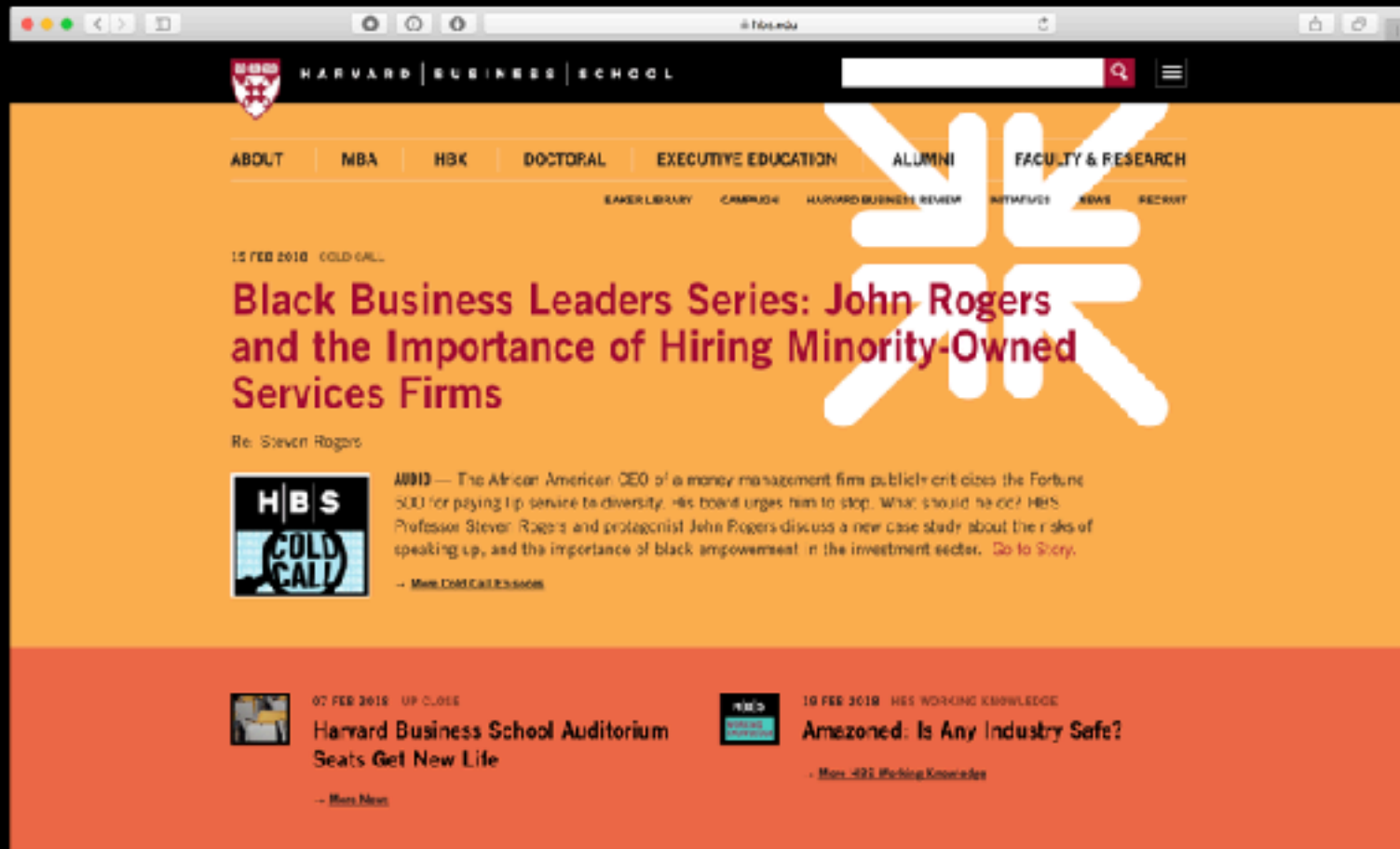




Request

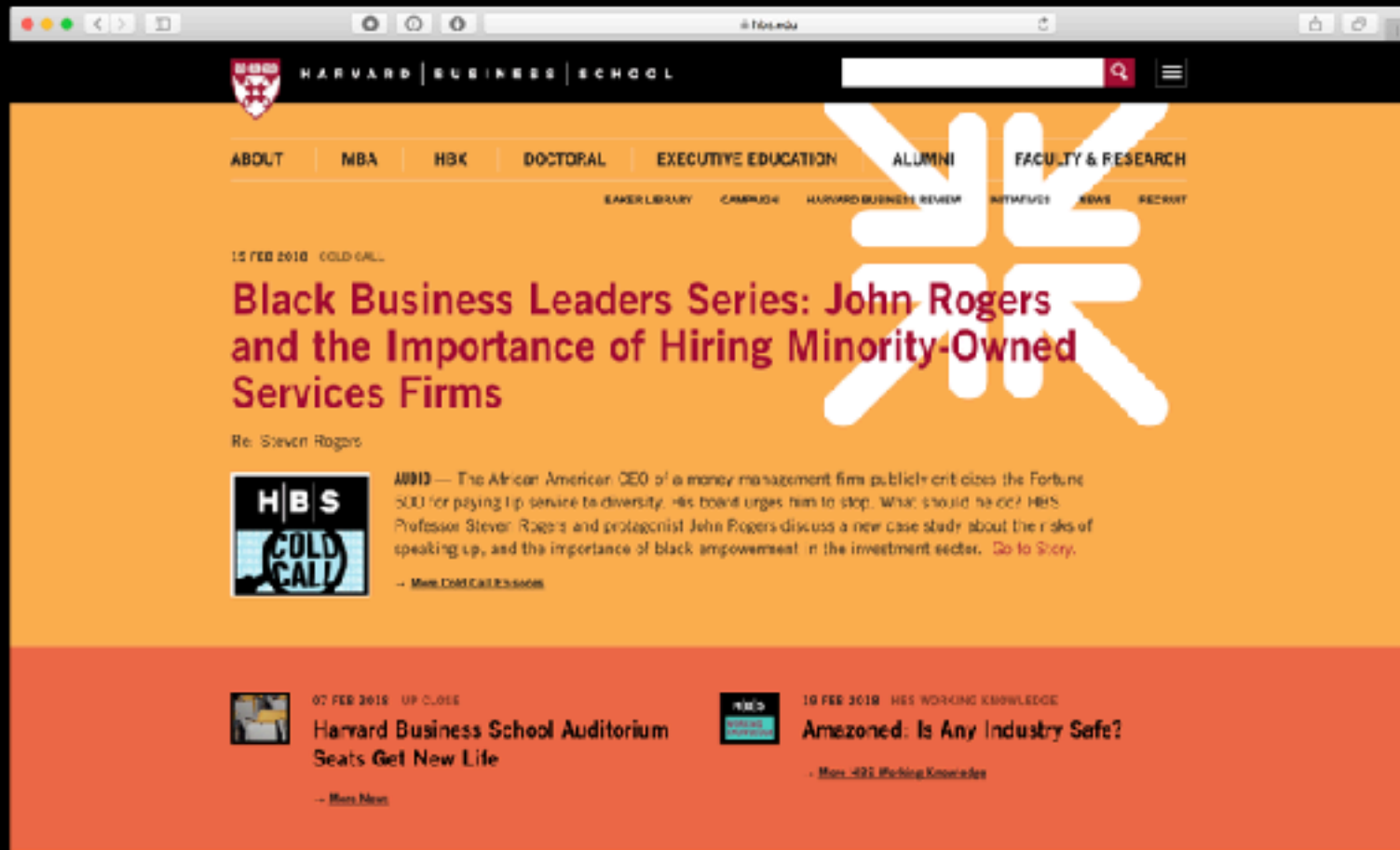


Backend



Response





Frontend

Response





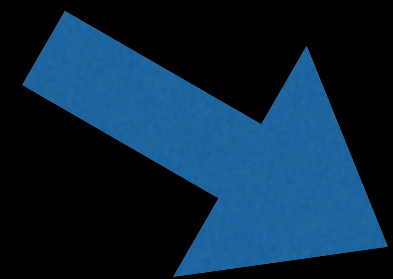
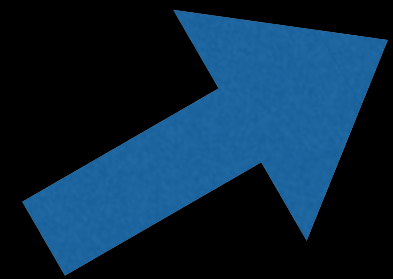




Web Server

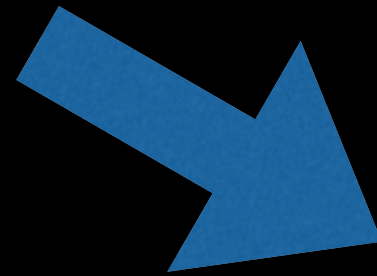
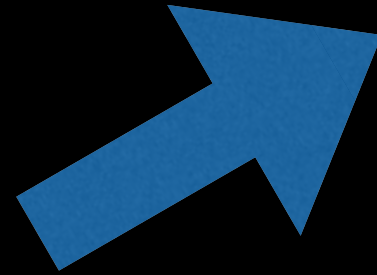


Web Server





Web Server



Email Server



Database Server

# Frontend Languages

Frontend ~~Languages~~

# Frontend Technologies

- HTML
- CSS
- Javascript



- **HTML**
- CSS
- Javascript

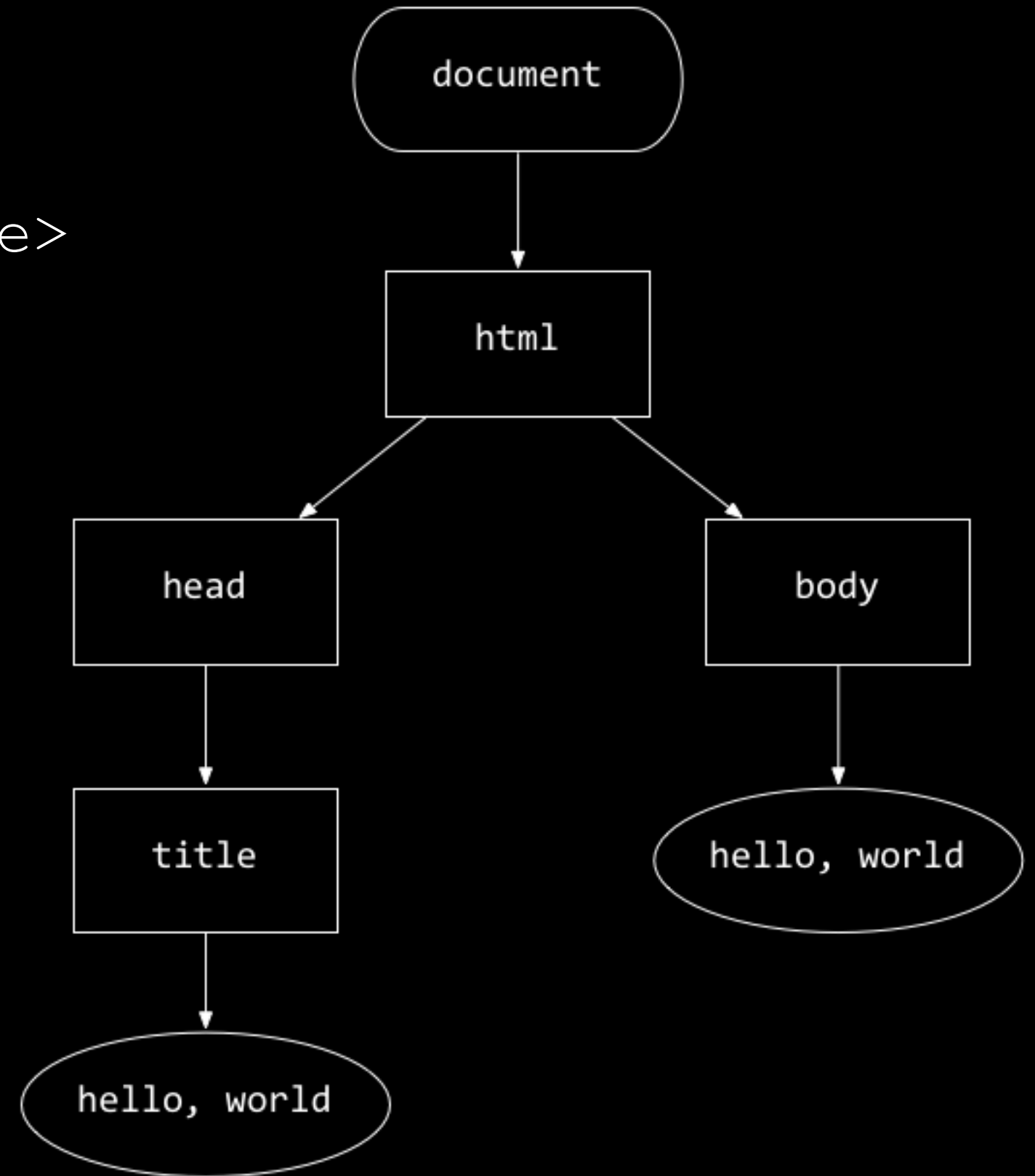
```
<!DOCTYPE html>
<html>
  <head>
    <title>hello, world</title>
  </head>
  <body>
    hello, world
  </body>
</html>
```

DOM

# DOM

Document Object Model

```
<!DOCTYPE html>
<html>
  <head>
    <title>hello, world</title>
  </head>
  <body>
    hello, world
  </body>
</html>
```





a#homepage-topnav-about.first | 71.78x21

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15 FEB 2018 COLD CALL

# Black Business Leaders Series: John Rogers and the Importance of Hiring Minority-Owned Services Firms

Re: Steven Rogers



AUDIO — The African American CEO of a money management firm publicly criticizes the Fortune 500 for paying lip service to diversity. His board urges him to stop. What should he do? HBS Professor Steven Rogers and protagonist John Rogers discuss a new case study about the risks of

Elements Console Sources Network Performance Memory Application Security Audits

<div class="desktop-visible"></div>  
<div id="strip0" class="orange-bg">  
 <div class="desktop-visible">  
 <div class="container container mobile-container tablet-container" id="background1" style="background-image: url('/HomepageImages/BackgroundImages/arrows\_four.png');">  
 ::before  
 <div class="site-header">  
 <div class="shin35"></div>  
 <div class="hr"></div>  
 <table class="navbar">  
 <tbody>  
 <tr>  
 <td class="first" width="9%">  
 <a class="first" href="https://www.hbs.edu/about/Pages/default.aspx" id="homepage-topnav-about-About">About</a> == \$0  
 </td>  
 <td></td>  
 </tr>  
 </tbody>  
 </table>  
 </div>  
 </div>  
 </div>  
</div>

Styles Computed Event Listeners

Filter show .cls +

element.style {  
}  
.component-framework table.navbar td.first a {  
 padding-left: 0;  
}  
.component-framework table.navbar a {  
 color: #181818;  
 padding-left: 1em;  
 padding-right: 1em;  
}  
table.navbar td a {  
 font-size: 17px;  
}

html body #container div div #container div div div #strip0 div #background1 div.site-header table.navbar tbody tr td.first a#homepage-topnav-about.first



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MAP / DIRECTIONS

- HTML
- **CSS**
- Javascript





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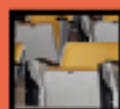
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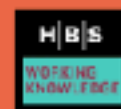
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```
.container {  
    background: some-ugly-orange;  
    font-size: 24pt;  
    width: 100%;  
}
```

```
#homepage-topnav-about {  
    text-transform: uppercase;  
    text-align: left;  
}
```

```
.container {  
    background: some-ugly-orange;  
    font-size: 24pt;  
    width: 100%;  
}
```

```
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}
```

- HTML
- CSS
- **Javascript**

Google Maps

Secure https://www.google.com/maps/@37.7755529,-122.3947138,15z

Search Google Maps

Sign In

Satellite

Map data ©2018 Google United States Terms Send feedback 1000 ft

Elements Console Sources Network Performance Memory Application Security Audits

View: [Icons] Group by frame Preserve log Disable cache Offline Online

Filter [ ] Hide data URLs All XHR JS CSS Img Media Font Doc WS Manifest Other

200 ms 400 ms 500 ms 600 ms 800 ms 1000 ms 1200 ms 1400 ms 1600 ms 1800 ms 2000 ms 2200 ms 2400 ms 2600 ms 2800 ms 3000 ms

Name	Status	Type	Initiator	Size	Time	Waterfall	10.00 s
pb-f1m41fm3111312131131316712m311e012sm/3141111...212.2126m114b11...	200	xhr	rs=ACT90oGaTkeF-_QeA13sNiruGfTy...	5.1 KB	34 ms	<div></div>	
pb-f1m41fm311131213112131316512m311e012sm/3141111...212.2126m114b11...	200	xhr	rs=ACT90oGaTkeF-_QeA13sNiruGfTy...	6.8 KB	31 ms	<div></div>	
pb-f1m41fm311131213112131316612m311e012sm/3141111...212.2126m114b11...	200	xhr	rs=ACT90oGaTkeF-_QeA13sNiruGfTy...	839 B	29 ms	<div></div>	
pb-f1m41fm311131213112131316712m311e012sm/3141111...212.2126m114b11...	200	xhr	rs=ACT90oGaTkeF-_QeA13sNiruGfTy...	181 B	27 ms	<div></div>	

7 / 16 requests | 49.9 KB / 157 KB transferred

when  clicked

say hello, world



# functions



# functions



```
window.alert("hello, world");
```

# loops



# loops



```
while (true)
{
    window.alert("hello, world");
}
```

# loops



# loops



```
for (var i = 0; i < 10; i++)  
{  
    window.alert("hello, world");  
}
```

# variables



# variables



```
var counter = 0;
while (true)
{
    window.alert(counter);
    counter++;
}
```



# Boolean expressions

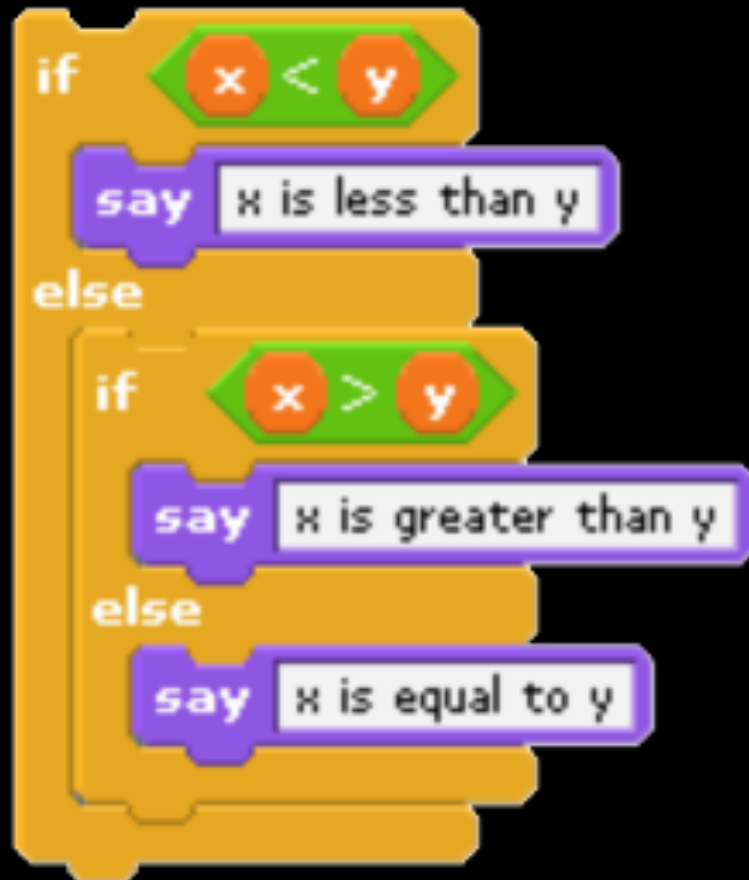


# Boolean expressions

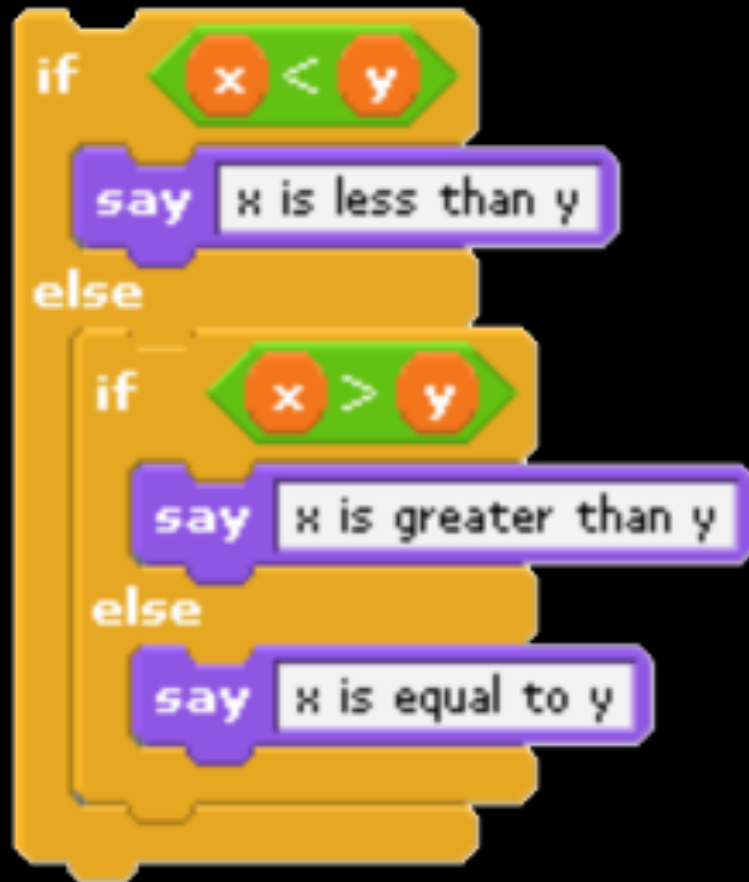


```
( x < y )  
( ( x < y ) && ( y < z ) )
```

# conditions



# conditions



```
if (x < y)
{
    window.alert("x is less than y");
}
else if (x > y)
{
    window.alert("x is greater than y");
}
else
{
    window.alert("x is equal to y");
}
```

# Events

- onclick
- onmouseover
- onkeypress
- ...

# DOM Examples

# Form Examples



# Geolocation Examples

# API

Application Programming Interface

<http://nifty.stanford.edu/2011/parlante-image-puzzle/>

getRed(x, y)

getGreen(x, y)

getBlue(x, y)

setRed(x, y, value)

setGreen(x, y, value)

setBlue(x, y, value)

<https://developers.google.com/maps/documentation/javascript/tutorial>

AlzaSyAmk7cP6WPIqLXgIP4mIQKg7RTDVxhKm50

<http://bit.ly/mba-key>

# Next Time

Mobile Strategies



- hybrid apps, native apps, web apps

# CS50 for MBAs

Web Programming