

Introduction to the Document Object Model

You're About to learn

- **What is the DOM?**
- **Why should we care?**
- **DOM Manipulation**
 - Searching the DOM
 - How to traverse the DOM
 - How to change the DOM

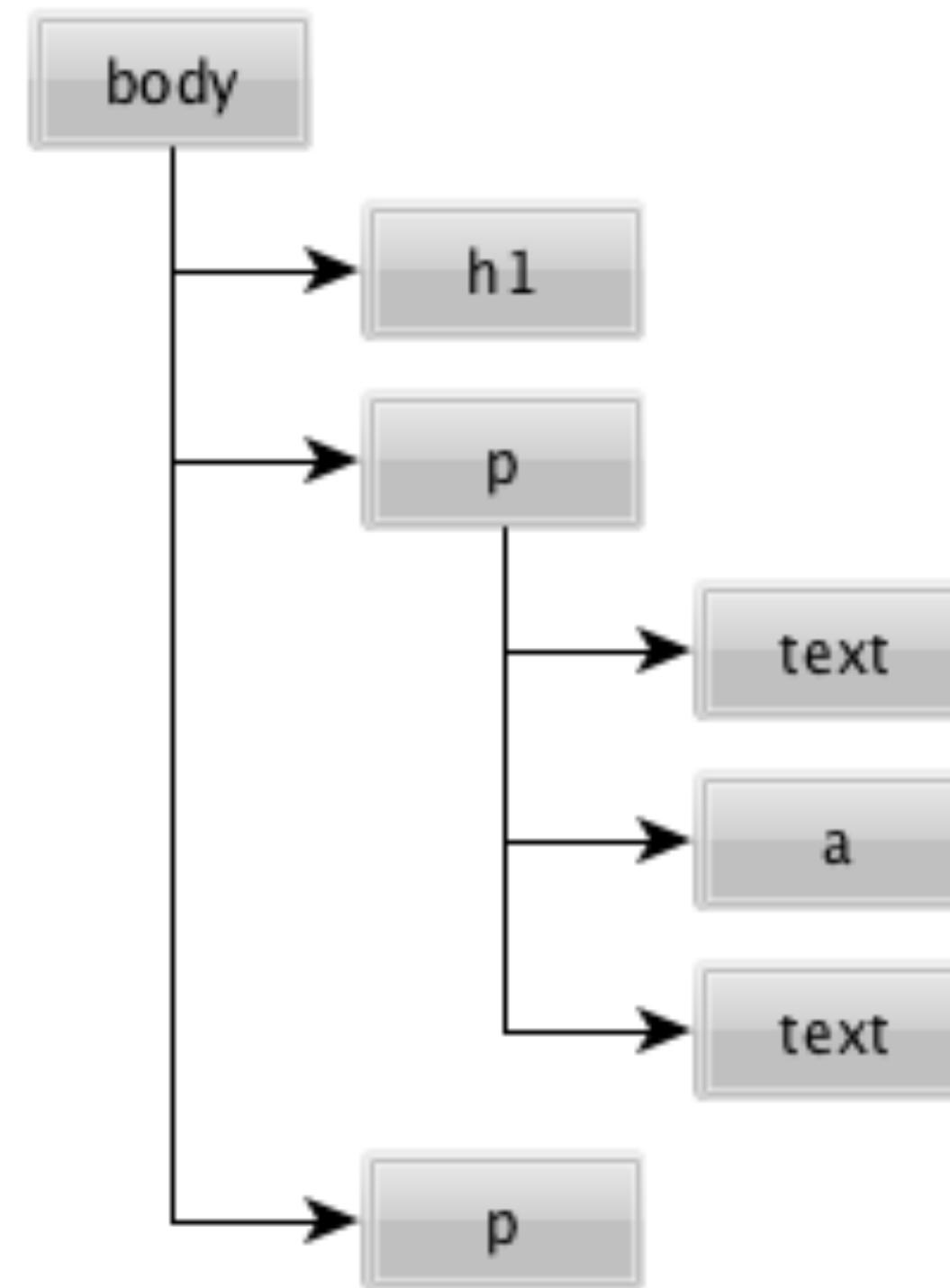
What is the DOM?



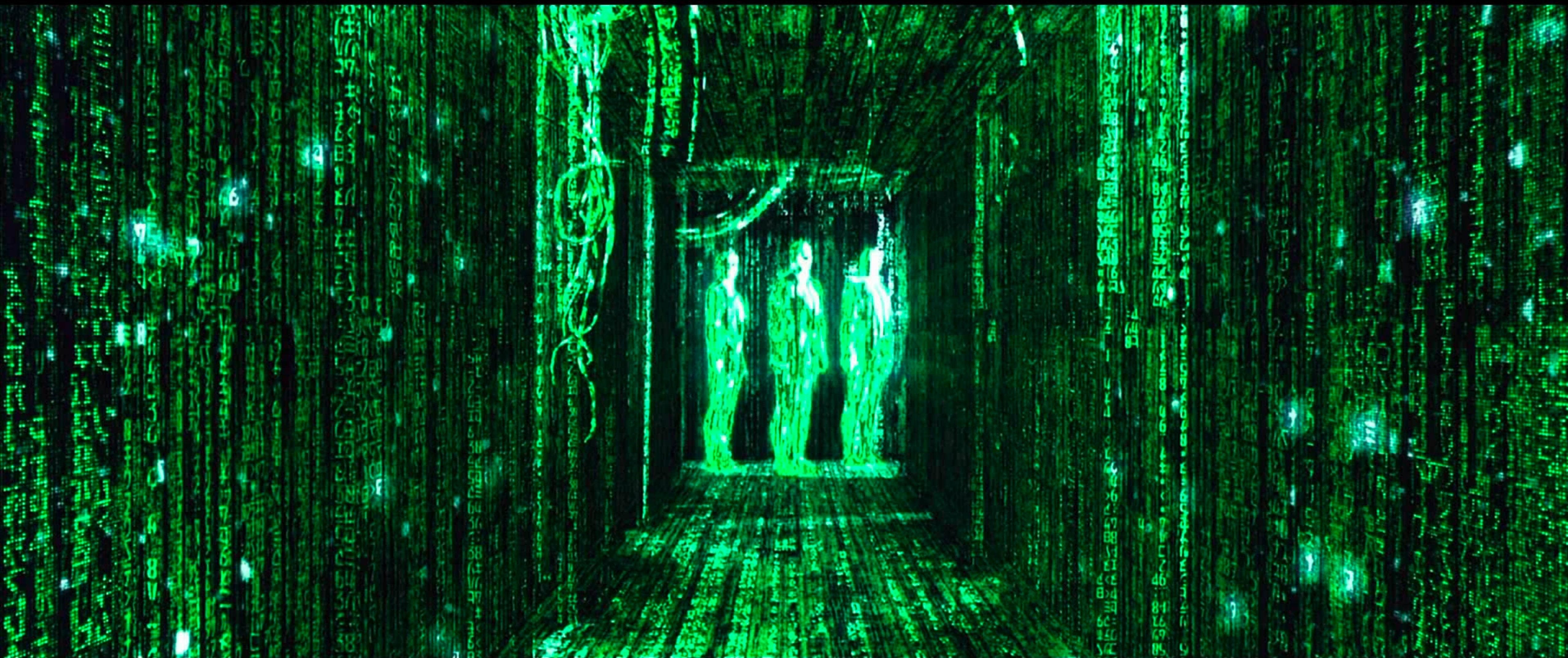
**The Document Object Model is what
allows web pages to render, respond to
user events and change**

HTML vs DOM

```
<body>
  <h1>Hello</h1>
  <p>
    Check out my
    <a href="/page">Page!</a>
    It's the best page out there
  </p>
  <p>Come back soon!</p>
</body>
```

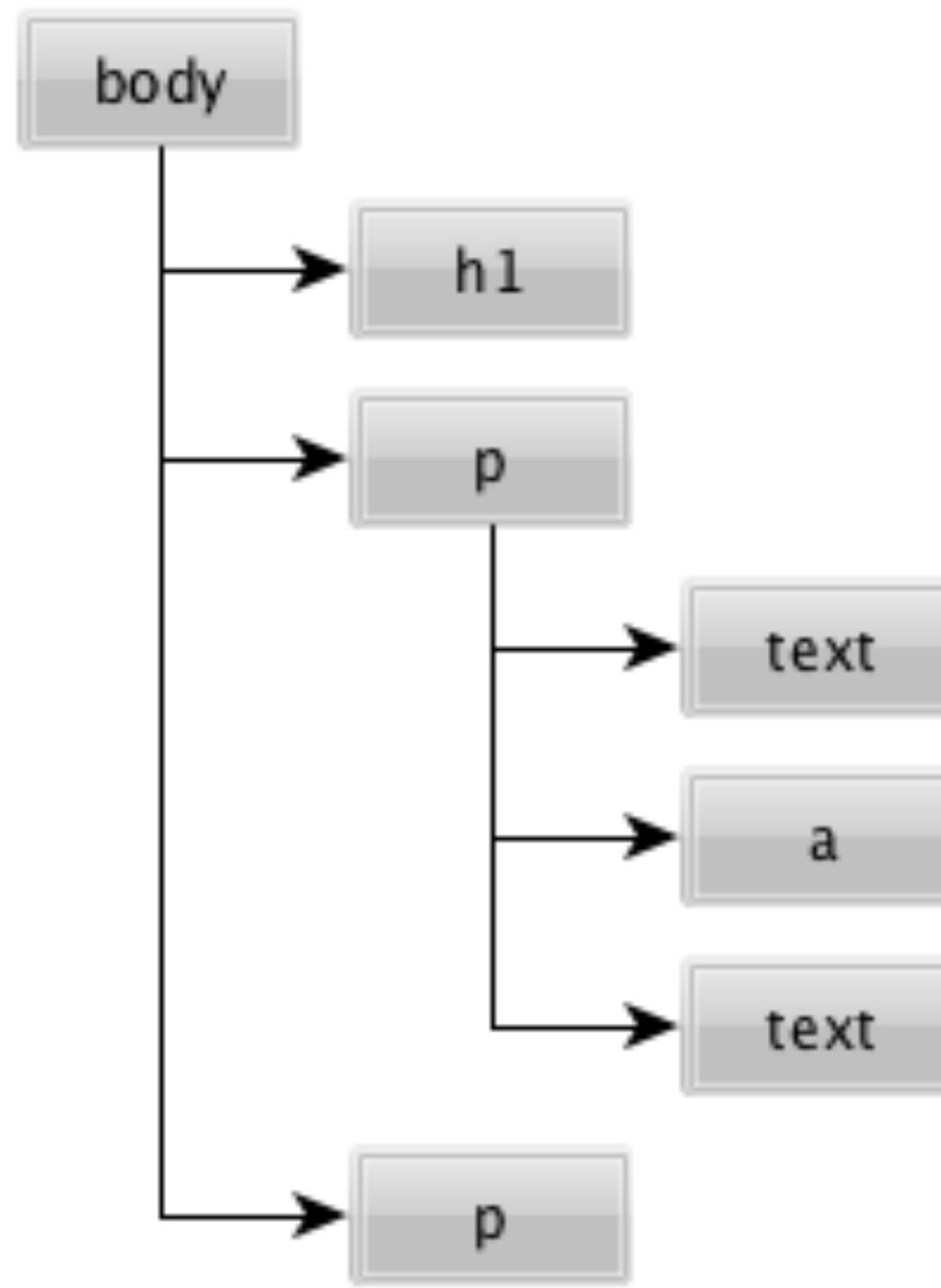




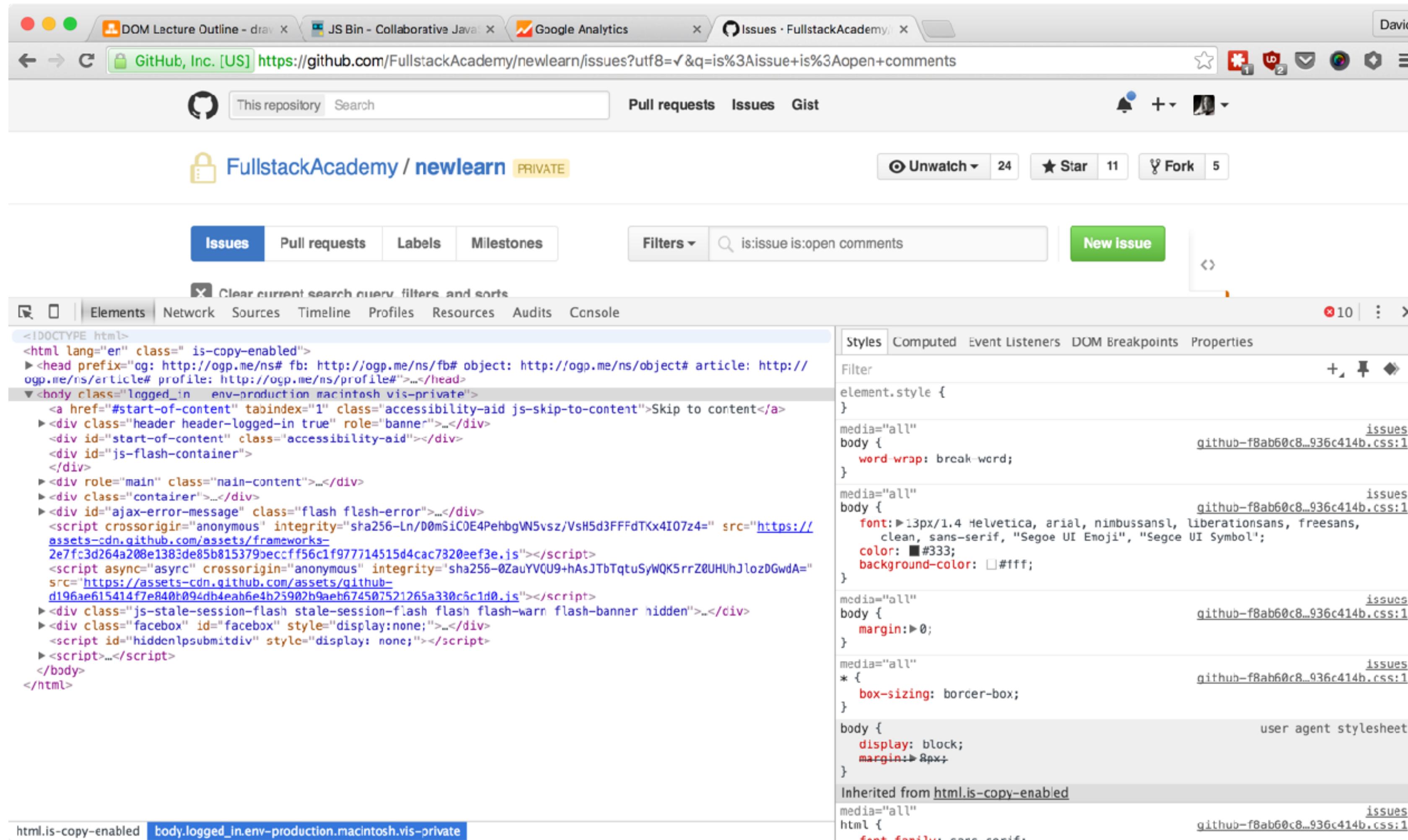


The DOM is a Tree

- Trees are a data structure from computer science
- The main idea here: There is a Node that branches into other Nodes (its children Nodes)
 - Each Node can have 0 to many children Nodes
 - Nodes can have 0 or 1 parent
 - Nodes can have 0 to many Sibling Nodes



Chrome Developer Tools



Why care?

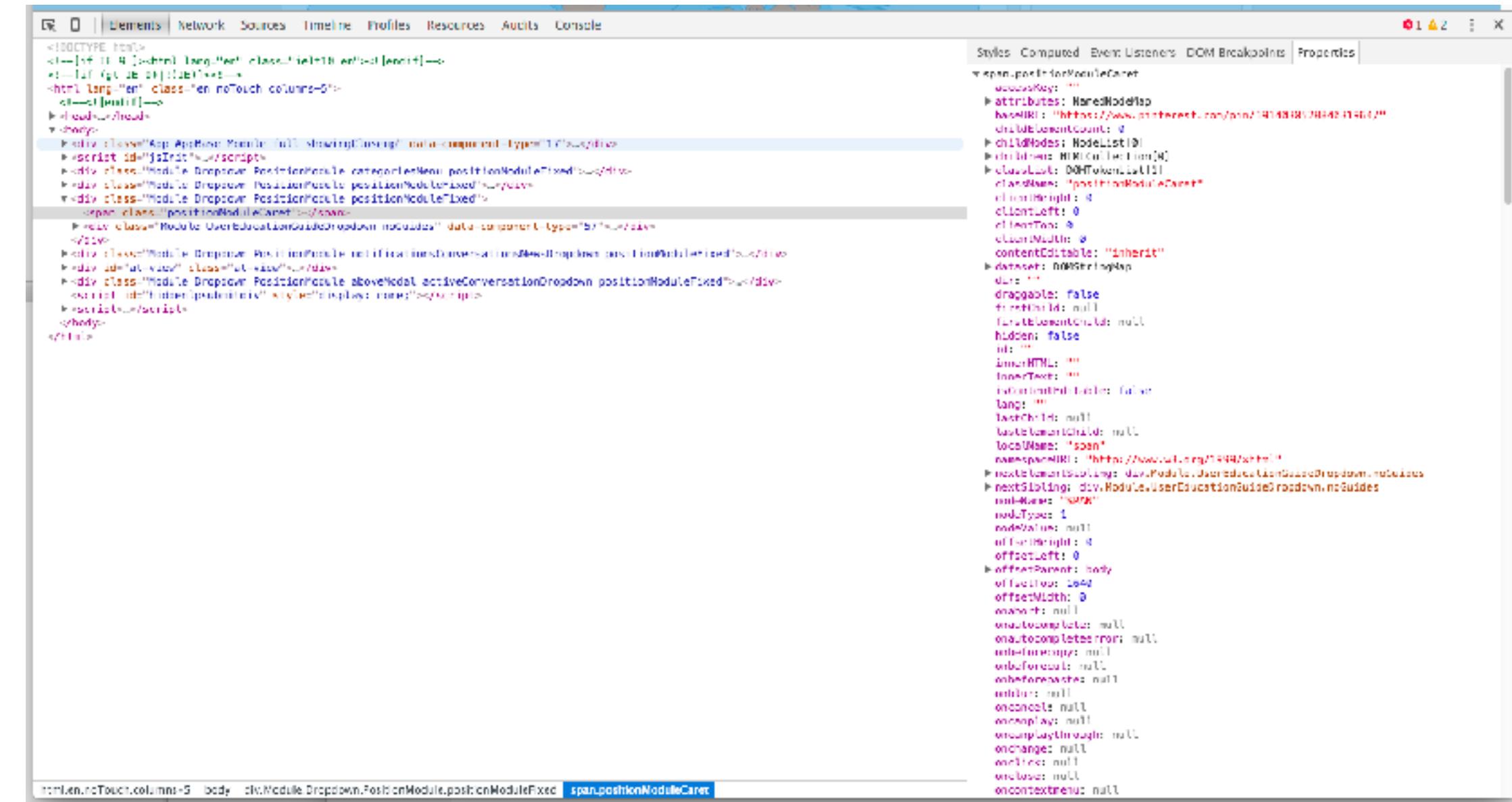


**The DOM makes possible to use
JavaScript to manipulate the document
content and structure**

Nodes have lots of Attributes

- Nodes are JavaScript Objects
- Nodes have Attributes that are JavaScript properties
- Attributes define how the Node looks and responds to User activity

ONE NODE



Hundreds of
properties!

The *document* Object

- Global reference to the DOM entry point
- Provides methods for:
 - Navigating the DOM
 - Manipulating the DOM
- The *document* object is the important connection between the DOM and JavaScript code

Searching the DOM



Searching the DOM

- **getElementById** (find nodes with a certain ID attribute)

```
<div id="ben">
  
  <p class="bio">Lorem ipsum...</p>
</div>

<div id="collin">
  
  <p class="bio">Lorem ipsum...</p>
</div>
```

document.getElementById("ben")

Returns ONE node, with the matching ID

Searching the DOM

- **getElementsByClassName** (find nodes with a certain CLASS ATTRIBUTE)

```
<div id="ben">
  
    <p class="bio">Lorem ipsum...</p>
  </div>
<div id="collin">
  
    <p class="bio">Lorem ipsum...</p>
  </div>
```

document.getElementsByClassName("pic")

Returns COLLECTION of nodes,
with the matching class attribute

Searching the DOM

- **getElementsByName** (find nodes with a certain HTML tag)

```
<div id="ben">
  
    <p class="bio">Lorem ipsum...</p>
  </div>
<div id="collin">
  
    <p class="bio">Lorem ipsum...</p>
  </div>
```

document.getElementsByTagName("p")

Returns COLLECTION of nodes,
with the matching tag

Searching the DOM

- querySelector, querySelectorAll (search using CSS selectors)

```
<div id="ben">
  
  <p class="bio">Lorem ipsum...</p>
</div>
<div id="collin">
  
  <p class="bio">Lorem ipsum...</p>
</div>
```

document.querySelector("div > img")

Returns FIRST node that matches the query

document.querySelectorAll("div > p")

Returns COLLECTION of nodes,

All of which match the query
(even if it's only one)

Array-Like Objects? Bleh!

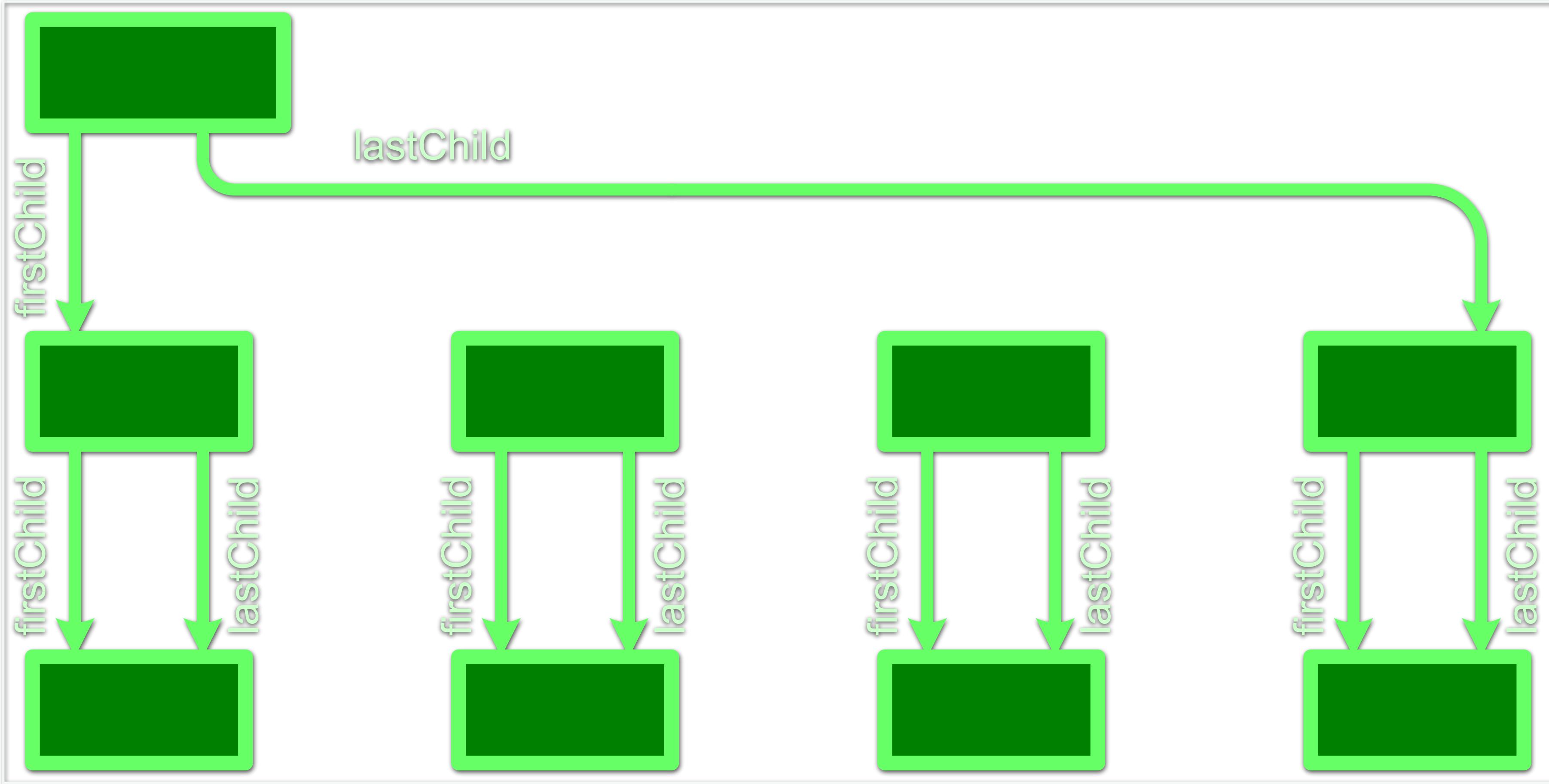
- `const realArr = [].prototype.slice.call(arrayLike)`
- `const realArr = Array.from(arrayLike)`
- `const realArr = [...arrayLike]`

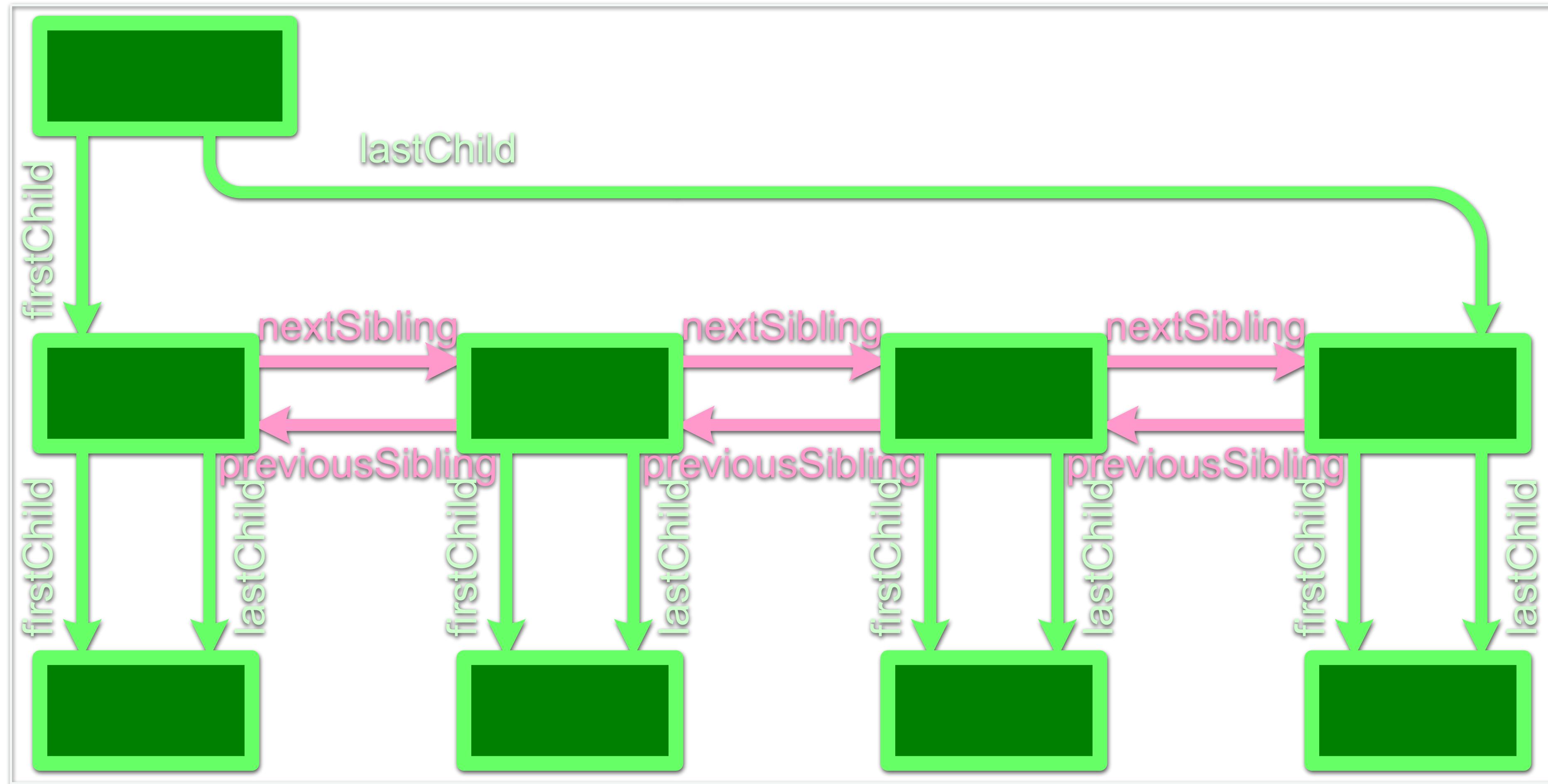
Traversing the DOM

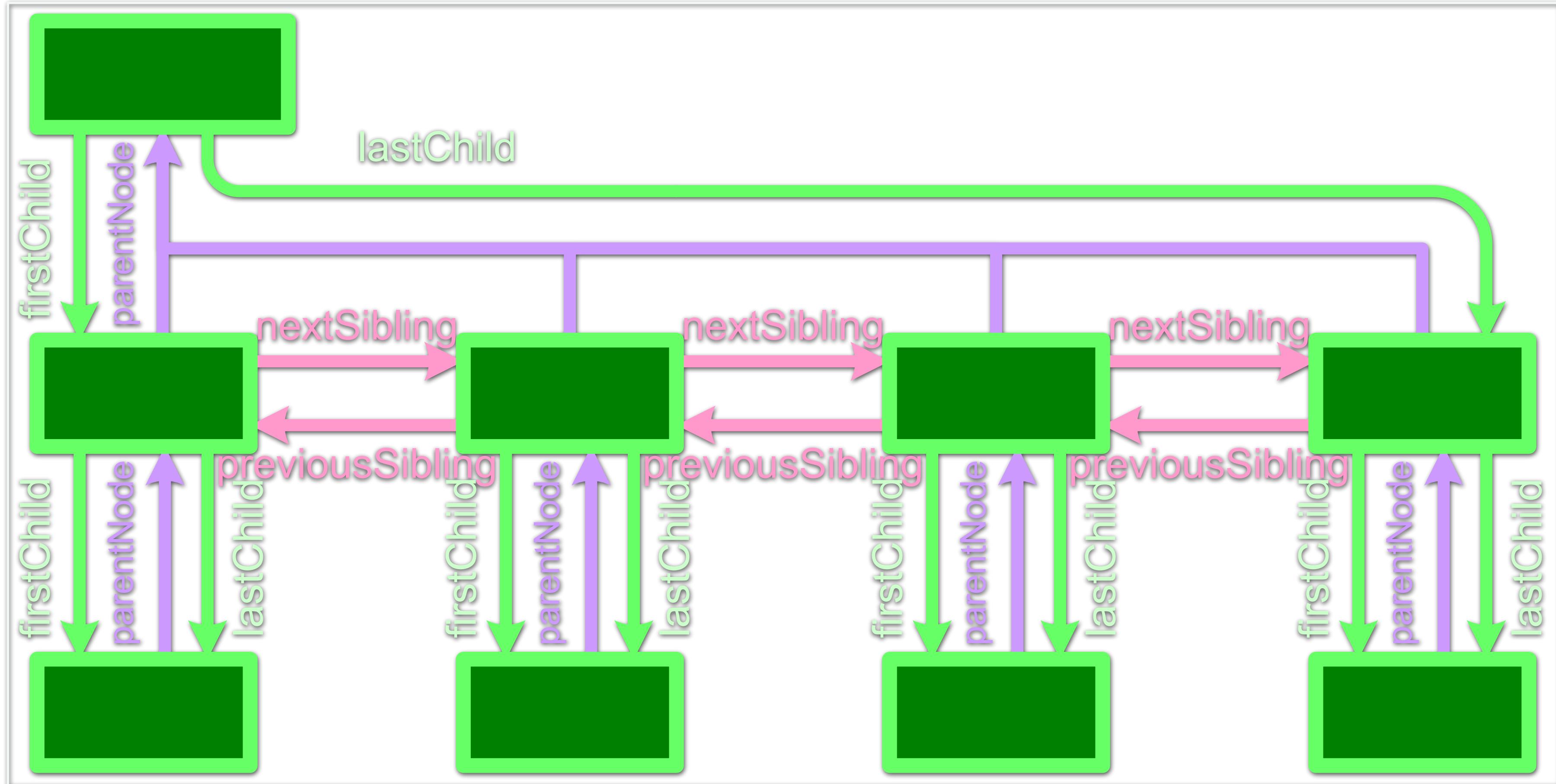


Traversing the DOM

- Tree Structures are easy to navigate:
 - At any point in the DOM you are at a Node
 - No matter where you go, you're still at a Node
 - Child
 - Parent
 - Sibling
 - All Nodes share similar DOM navigation methods







Traversing the DOM

- **Access children**

- `element.children`, `element.lastChild`, `element.firstChild`

- **Access siblings**

- `element.nextElementSibling`, `element.previousElementSibling`

- **Access parent**

- `element.parentElement`

Changing the DOM



Changing style attributes

```
element.style.backgroundColor = "blue";
```

- **CSS**

- background-color →
- border-radius →
- font-size →
- list-style-type →
- word-spacing →
- z-index →

- **JavaScript**

- backgroundColor
- borderRadius
- fontSize
- listStyleType
- wordSpacing
- zIndex

Changing CSS Classes

- ***className* attribute is a string of all of a Node's classes**
- ***classList* is HTML5 way to modify which classes are on a Node**

```
document.getElementById("MyElement").classList.add('class');

document.getElementById("MyElement").classList.remove('class');

if ( document.getElementById("MyElement").classList.contains('class') )

document.getElementById("MyElement").classList.toggle('class');
```

Creating Elements

- **Create an element**
 - `document.createElement(tagName)`
- **Duplicate an existing node**
 - `node.cloneNode()`
- **Nodes are just free floating, not connected to the document itself, until you *link* them to the DOM.**

Adding elements to the DOM

- **Insert newNode at end of current node**
○`node.appendChild(newNode);`
- **Insert newNode at beginning of current node**
○`node.prependChild(newNode);`
- **Insert newNode before a certain childNode**
○`node.insertBefore(newNode, sibling);`

Removing Elements

- Removes the `oldNode` child.
 - `node.removeChild(oldNode);`
- Quick hack:
 - `oldNode.parentNode.removeChild(oldNode);`
- Remove node directly:
 - `node.remove()`
 - Not supported in IE or Mobile Safari

WORKSHOP

