



Topic 9: JavaScript

Document Object Model (DOM)

Lecture Contents

- What is an Array
- Why Are Arrays Useful?
- Array Practice: `function printArray(a)`

Adding JavaScript to Your Web Page

- Ways to add CSS:

- Inline: `<h1 style="color: blue; text-align:center;"> ...`
- Internal: `<style> h1 { color: blue; text-align: center } ...`
- External: `<link rel="stylesheet" href="styles.css">`

- Ways to add JavaScript

- Inline: `<body onload="alert('Hello')">`
- Internal: `<script type="text/javascript">alert("Hello"); ...`
- External: `<script src="index.js"></script>`
 - `<link>` for CSS usually in `<head>`.
 - `<script>` tag for JavaScript usually at end before `</body>`

- 
- Catalogs web page into object to select and manipulate
 -

```
<!DOCTYPE html>
```

```
<html lang="en">
```

```
<head>
```

```
<title>Simple DOM</title>
```

```
</head>
```

```
<body>
```

```
<header>
```

```
<a href="home.html"></a>
```

```
<h1>The Greatest Website</h1>
```

```
</header>
```

```
<nav>
```

```
<a href="home.html">Home</a>
```

```
<a href="about.html">About Us</a>
```

```
</nav>
```

```
<main>
```

```
<h2>Under Construction</h2>
```

```
<p>Our website will be up and running  
soon!</p>
```

```
</main>
```

```
<footer>
```

```
Contact us at:
```

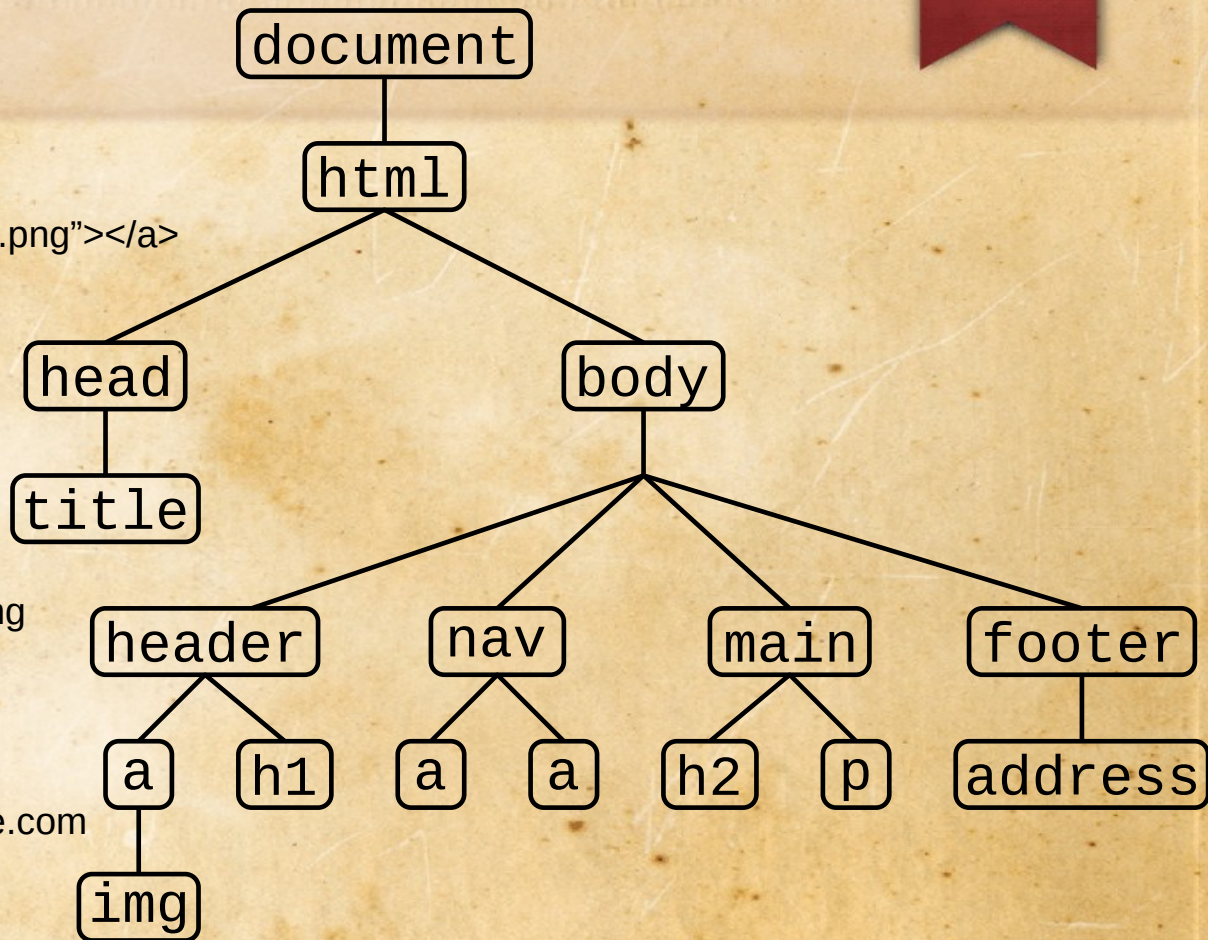
```
<address>greatestwebsite@example.com
```

```
</address>
```

```
</footer>
```

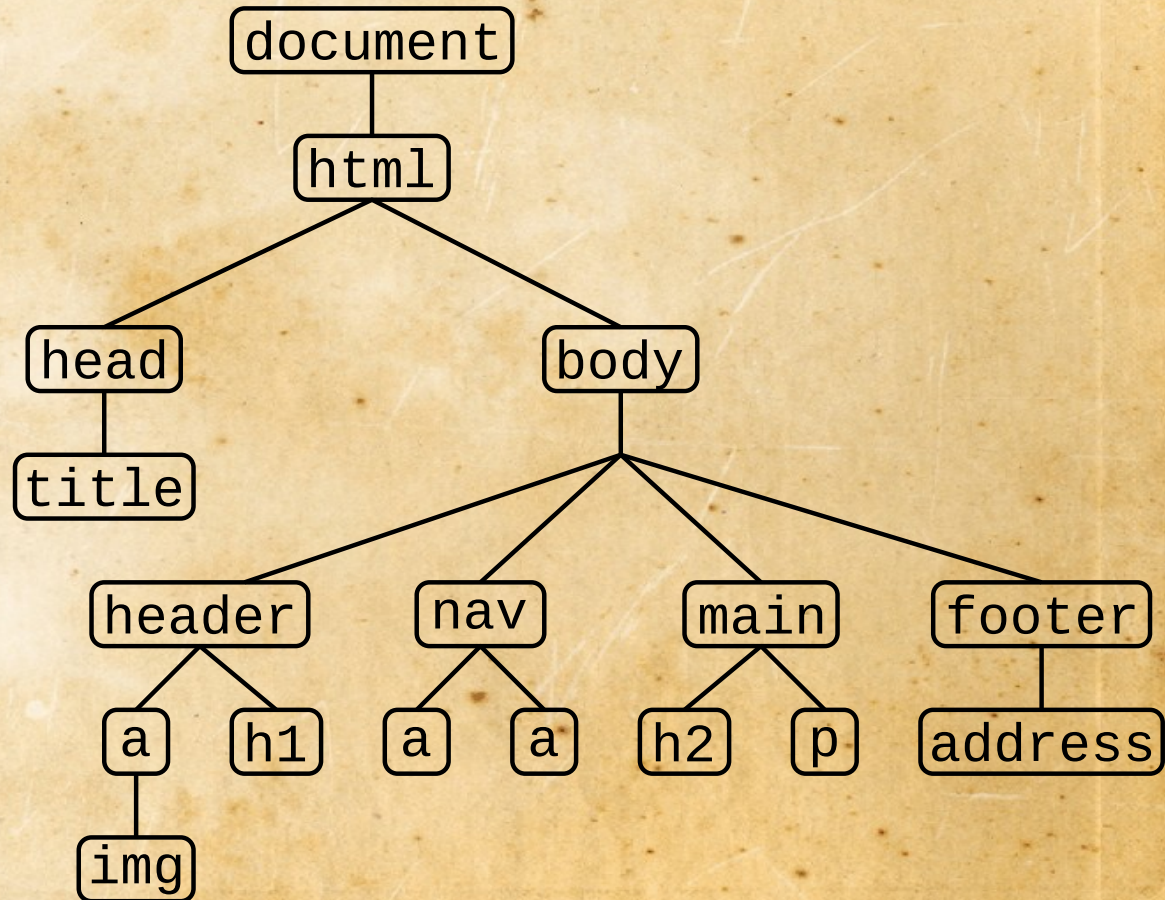
```
</body>
```

```
</html>
```



Selecting DOM Elements

- head and body are *siblings*
- body is the *child* of html
- html is the *parent* of body



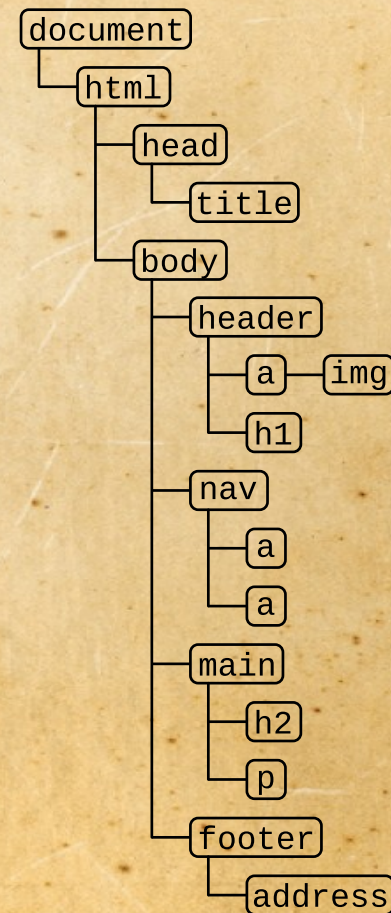
Selecting DOM Elements

- DOM fields

`.firstChild` : object
`.firstChildElement` : object
`.children` : HTMLCollection (array)
`.childNodes` : NodeList (array)

`.parentElement` : object

`document.head`
`document.body`



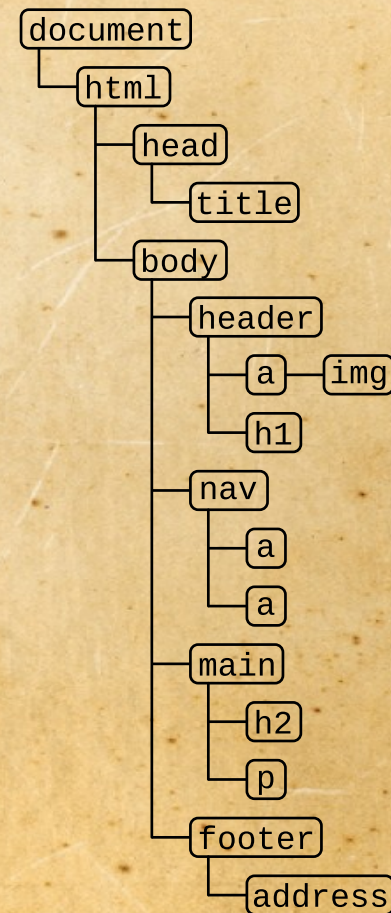
Selecting DOM Elements

- DOM fields

`.childNodes : NodeList (array)`

`.nodeTypes`

- 1 - Element
- 2 - Attribute
- 3 - Text
- 4 - CDATASection `<![CDATA[[ ... ]]>`
- 7 - ProcessingInstruction `<?xml-stylesheet ... ?>`
- 8 - Comment `<!-- ... -->`
- 9 - Document
- 10 - DocumentType `<!DOCTYPE html>`
- 11 - DocumentFragment



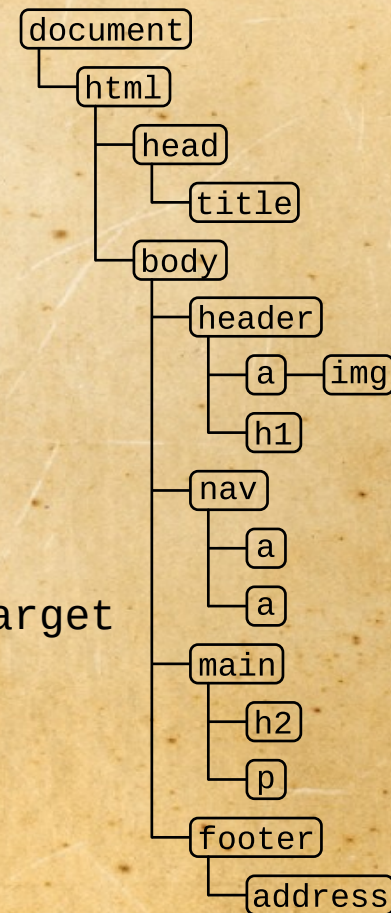
Selecting DOM Elements

- DOM fields

`.childNodes : NodeList (array)`

`.nodeName`

- 1 - **Element** : uppercase name of HTML tag or lower case XML tag (e.g.: `svg`, `mathml`)
- 2 - **Attribute** : qualified name of attribute
- 3 - **Text** : `#text`
- 4 - **CDATASection** : `#cdata-section`
- 7 - **ProcessingInstruction** : `ProcessingInstruction.target`
- 8 - **Comment** : `#comment`
- 9 - **Document** : `#document`
- 10 - **DocumentType** : value of `DocumentType.name`
- 11 - **DocumentFragment** : `#document-fragment`

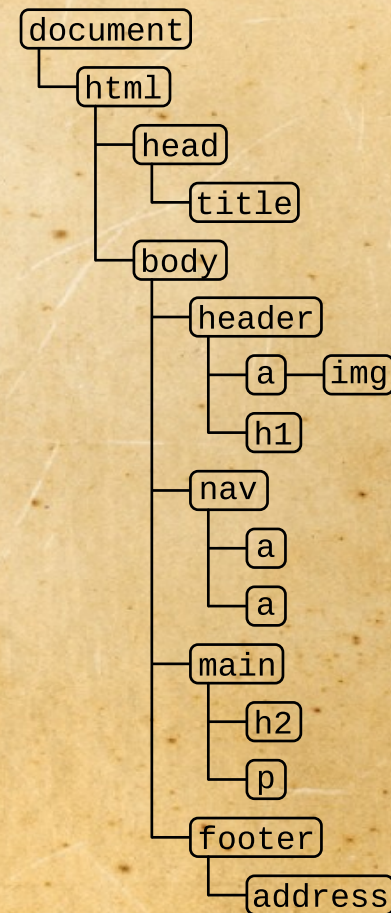


Selecting DOM Elements

- Finding DOM elements

```
.getElementsByTagName( "li" ) : array  
.getElementsByClass( "myClass" ) : array  
.getElementById( "myId" ) : object
```

```
.querySelector( "h1" ) : object  
.querySelector( "#myId" ) : object  
.querySelector( ".myClass" ) : object  
.querySelector( "h2.myClass" ) : object  
.querySelectorAll( "h2" ) : array
```

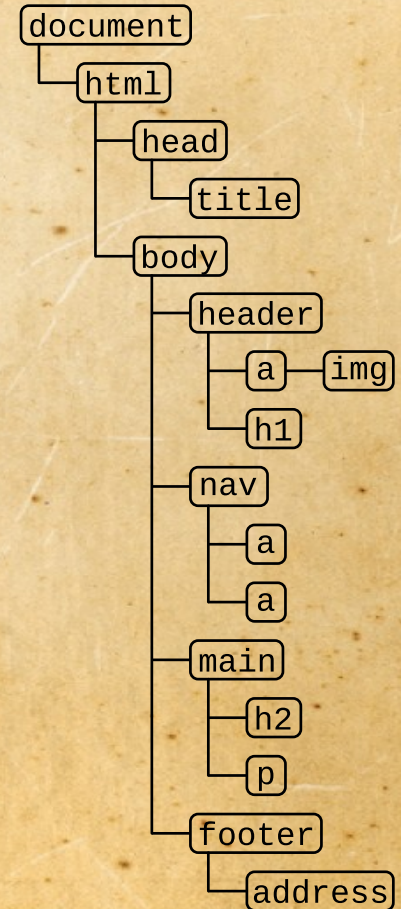


Adding DOM Elements

- Adding DOM elements

```
.append( "Text here" );
```

```
elem1 = document.createElement( "h1" );  
.appendChild( elem1 );
```



DOM Element Attributes

- HTML Attributes

`.attributes`

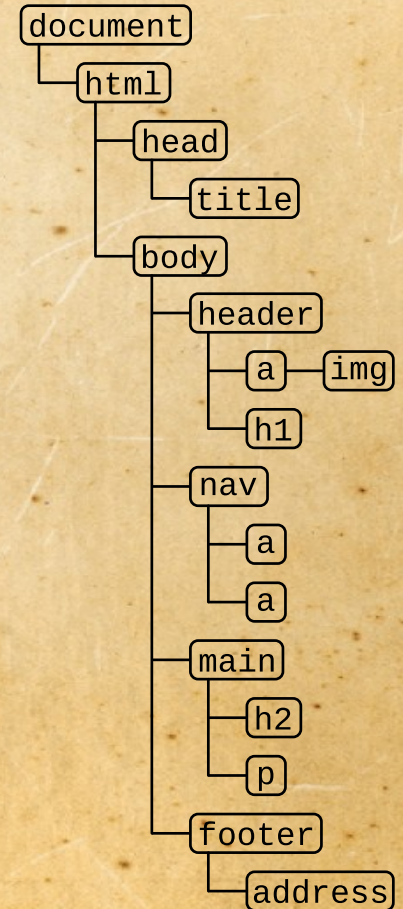
`.getAttribute( "href" );`

`.setAttribute( "href", "home.html" );`

`.title = "asdf";`

`.removeAttribute( "title" );`

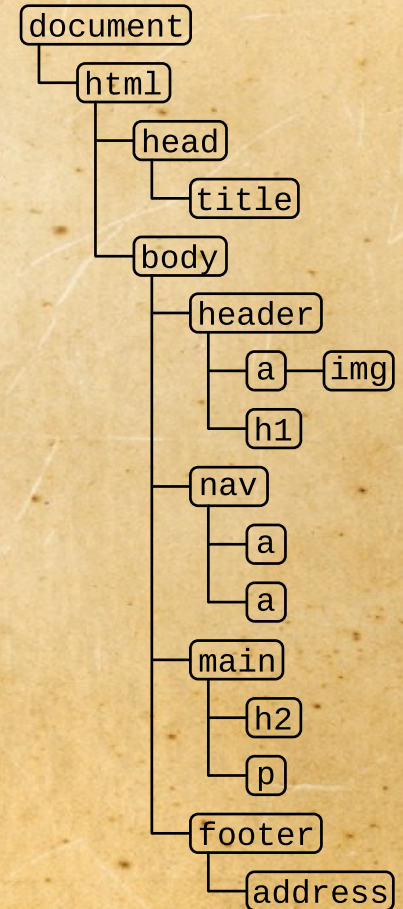
`.style.backgroundColor = "red";`



DOM CSS Styles

- Setting CSS Styles

```
Document.querySelector("h1").style.color="red";  
  
.style.backgroundColor="red";  
    // camel case replaces hyphenation!
```



Separation of Concerns

- Purpose of each file:
 - HTML –
 - CSS –
 - JavaScript –

Separation of Concerns

- Purpose of each file:
 - HTML – content
 - CSS – style
 - JavaScript – behavior

Separation of Concerns

- Purpose of each file:
 - HTML – content
 - CSS – style
 - JavaScript – behavior
- Better to **NOT** change styles using JavaScript
 - Solution: add/remove class names

✗ `Document.querySelector("h1").style.color="red";`

✓ `Document.querySelector("h1").classList.add("warningTitle");`
`Document.querySelector("h1").classList.remove("warningTitle");`
`Document.querySelector("h1").classList.toggle("warningTitle");`

Selecting DOM Elements

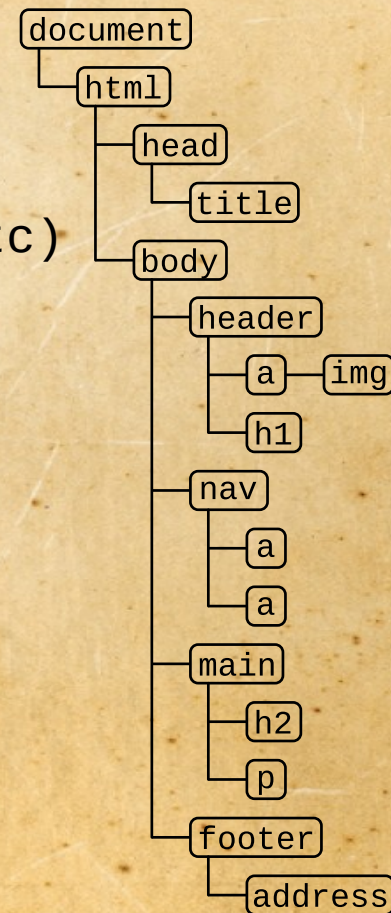
- DOM fields

`.innerText` ← as displayed on web page

`.textContent` ← as written in HTML (extra spaces, etc)

`.innerHTML`

`.outerHTML`







Topic 9: JavaScript

Document Object Model (DOM)