Working with the DOM

Advanced JavaScript

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tl;dr

- The DOM gives your JavaScript access to anything on the page
- You can add elements, remove elements, or change elements
- Accessing form fields should be done with the value property
- Event handling should be done with addEventListener() but there are other ways

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The browser knows about an object called 'document'

It is an object which represents the entire HTML document loaded

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It has an property called "children"

```
let kids = document.children;
```

- 'kids' is an object of type *HTMLCollection*

```
let greatGreatGrandChild =
  document.children[0].children[4].children[8].children[1];
```

- You can use this to get any element on the page
- It's a **model** of all of the **objects** in the **document**! It is the ...

DOM!

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To alter content dynamically, we will ...

1. Get existing elements
2. Change those elements
   - Remove them
   - Change them
   - Append content to them

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Getting elements

```
let aDiv = document.getElementById("linksDiv");
let allDivs = document.getElementsByTagName("div");
let allAlerts = document.getElementsByClassName('alert');
```

- And the all-new, all-improved ...

```
let firstradio = document.querySelector('[type=radio]');
let allTxtBox = document.querySelectorAll('[type=text]');
```

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Removing elements

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To add elements, use createElement()

```
const e = document.getElementById("foo");
let p = document.createElement("p");
p.textContent = "Excelsior!"

e.appendChild(p);

let i = document.createElement("img");
i.src = "/imgs/stanLee.jpg";

e.appendChild(i);
```

Create a <p> in memory...

... and put it on the page

Create an <img>

... and put it on the page

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Changing elements

```
p.style.background = "yellow";
p.style.height = "50px";
p.setAttribute("title", "Stan says this");
```

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So we *could* use innerHTML instead

```
e.innerHTML = `
<img src='/img/stanLee.jpg' />
<p>Excelsior!</p>`;
```

But ...

1. innerHTML is not part of the W3C spec (even though all browsers support it)
2. It forces a re-render which is slower

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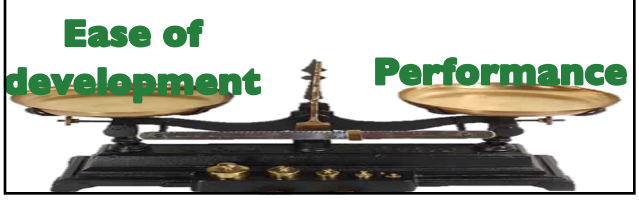
It's easier to add with innerHTML

When you set innerHTML, the browser ...

1. forces a parsing of a sub-DOM
2. which is then injected into the page DOM
3. which is then re-parsed and
4. which is then re-rendered



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Forms and the DOM

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Use *value* to get to form fields

- To read:

```
document.querySelector("input[type='text']");
let foo = field.value;
```

- To write:

```
field.value = "foo";
```

Note: It is not innerHTML nor innerText.

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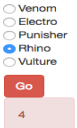
Getting the selected radio button

```
<input type='radio' value="1" name="foe" />Venom
<input type='radio' value="2" name="foe" />Electro
<input type='radio' value="3" name="foe" />Punisher
<input type='radio' value="4" name="foe" />Rhino
<input type='radio' value="5" name="foe" />Vulture
<button>Go</button>
<div id="output"></div>
<script>
document.querySelector("button")
  .addEventListener("click",() => {
  foe = document.querySelector(":checked").value;
});
</script>
```



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Select Lists

```
<select multiple>
 <option value="1">Venom</option>
 <option value="2">Electro</option>
 <option value="3">Punisher</option>
 <option value="4">Rhino</option>
 <option value="5">Vulture</option>
</select>
<button>Go</button>
<script>
document.querySelector("button")
  .addEventListener("click",() => {
   foes = document.querySelectorAll(":checked");
    .map(o => o.value);  // Array of selected values
});
</script>
```

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Event Handling

How to make your page respond to the user

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Four ways to wire them up

Type	Vehicle	Pros	Cons
IE 8 and below	e.attachEvent('onevent', function () {...});	Works in IE 8-	Only works in IE 8-
HTML attribute	<e onevent="f()" />	Simplest	Least flexible
DOM Level 0 style	e.onevent = function () {...};	SOC	Old-school
DOM Level 2 style	e.addEventListener(event, function () {...});	Most capable and flexible	Most typing

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IE 8 and below style

- Obviated by addEventListener() in IE9
- Completely removed in IE11

```
var btn = document.getElementById('btn');
btn.attachEvent('onclick', function (e) {
  // Do stuff
});
```

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HTML Attributes

- Example:

```
<input type='button' onclick='doSomething()' value='Go' />
```

- Sets the event handler.
- Clobbers all old event handlers
- Can only have one event

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DOM Level 0 Style

- Example:

```
var btn = document.getElementById('btn');
btn.onclick = function (e) {
  // Do stuff
}
```

- Once again, not additive.

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DOM Level 2 Style

- Example

```
var btn = document.getElementById('btn');
btn.addEventListener('click', function (e) {
  // Do stuff
}, false);
```

Note: No "on"!

- This is additive. It doesn't clobber!
- The third argument, a bool says if we should capture
  - true = capture
  - false = bubble (the default)

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So many choices! Which one to use?

- Fortunately this is an easy decision.

Use addEventListener()

- If you must support IE8-, use something like this:

```
if (x.addEventListener)
  x.addEventListener(...)
else
  x.attachEvent(...)
```

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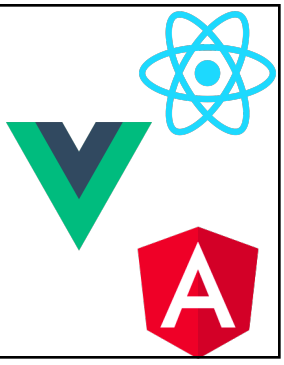
jQuery
write less, do more.

DOM manipulation is so much easier with certain JavaScript libraries

mootools
a compact javascript framework



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