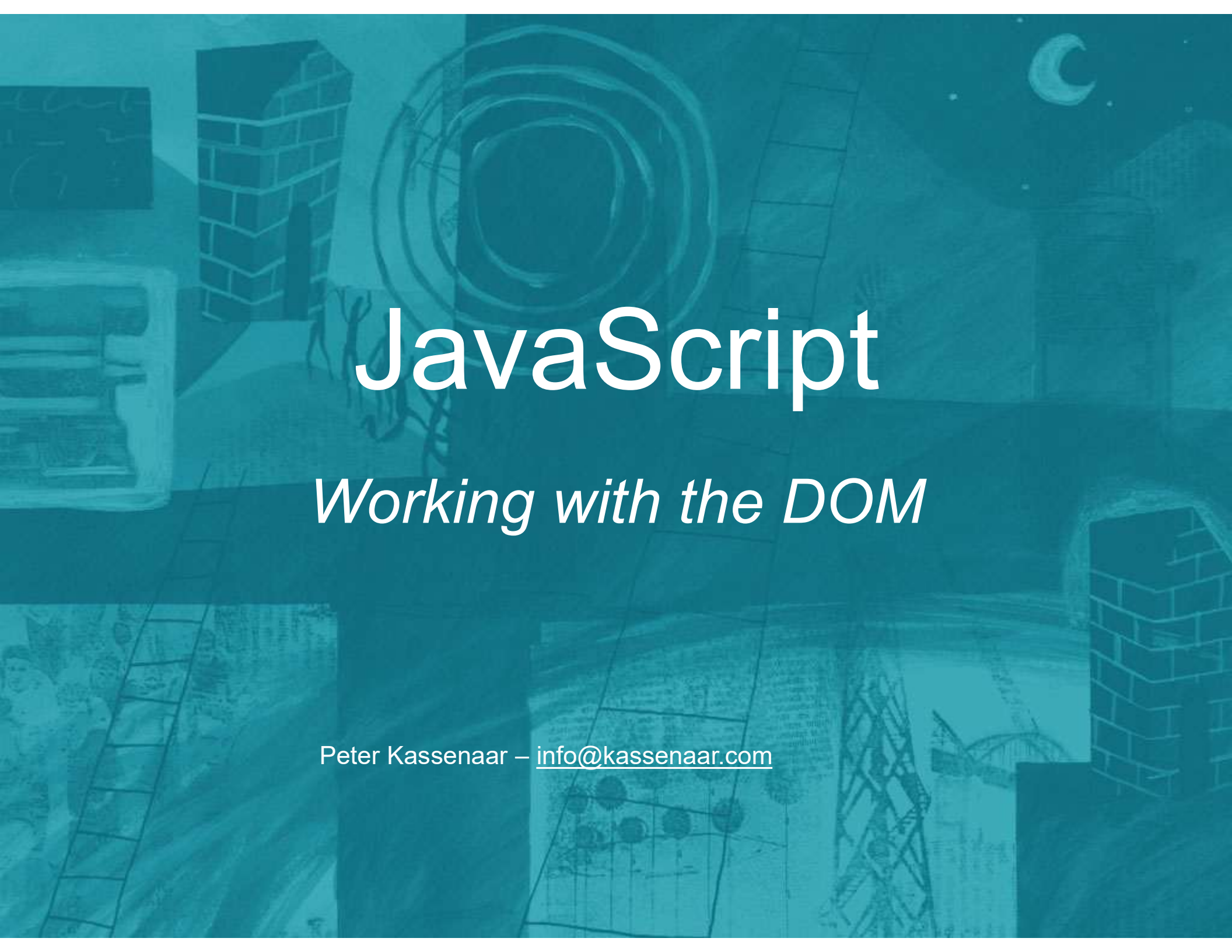

JavaScript

Working with the DOM

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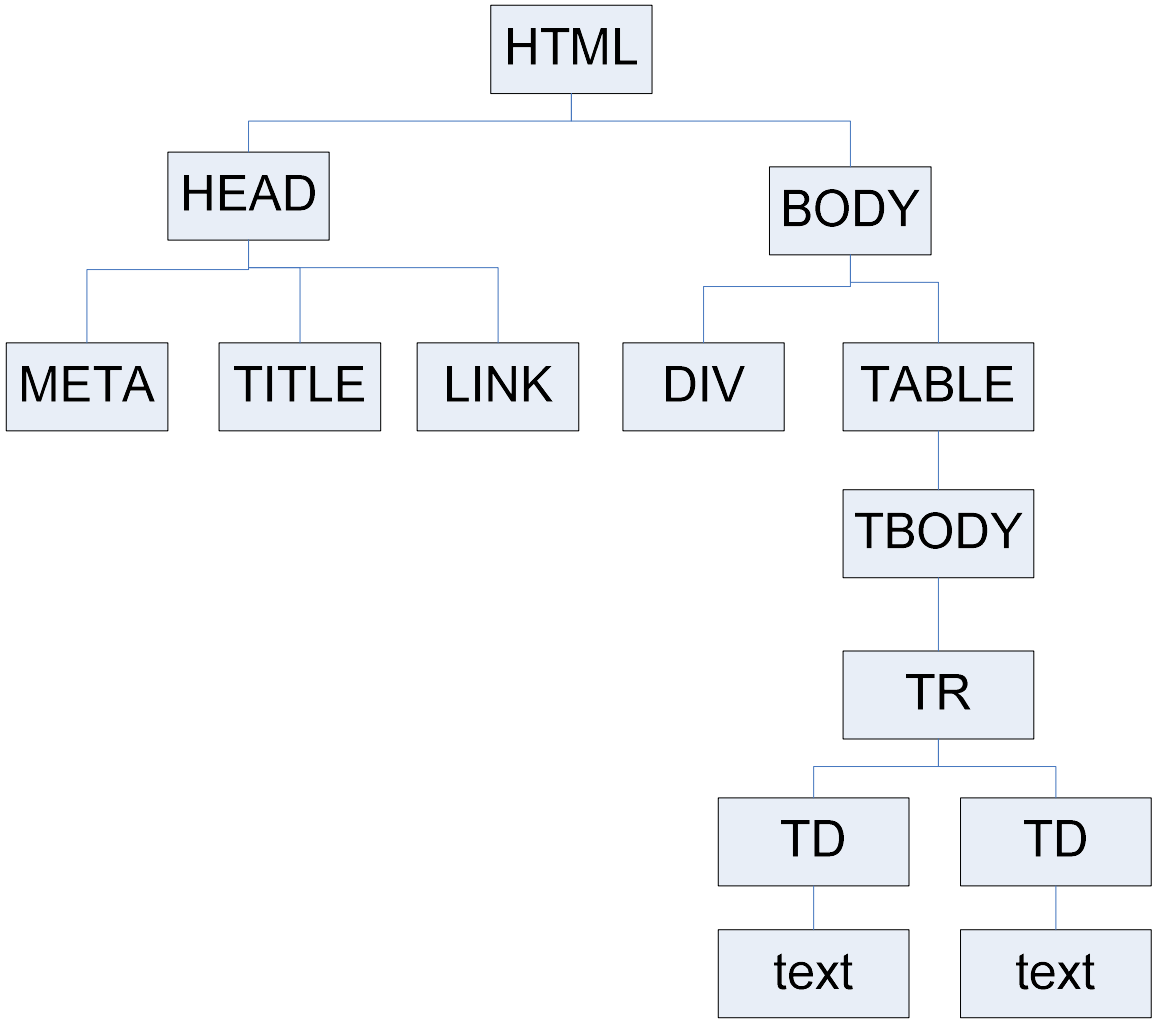
What is HTML DOM?

Built into **every browser** – enabling JavaScript to interact with the web page

“The HTML DOM (Document Object Model) is a hierarchical representation of a webpage's structure.

This enables JavaScript to manipulate, style, and interact with elements.”

Document Object Model

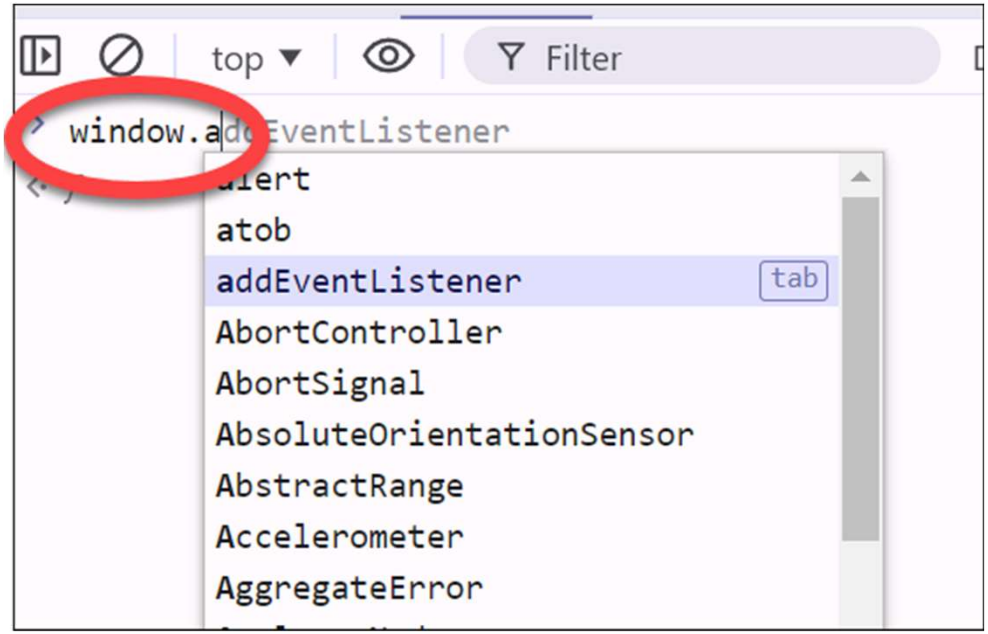


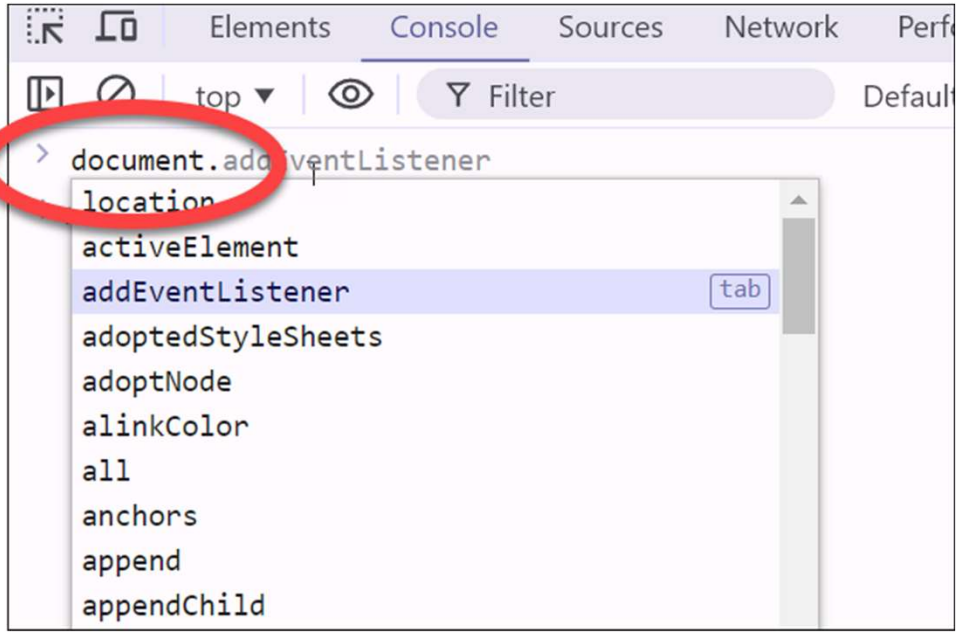
Document Object Model

- Built-in object structure in the browser
- HTML elements are accessible via JavaScript
- Dynamic adaptation of HTML
  - Formerly: ‘DHTML’
- Standardised by W3C (DOM level 2)
- Early days: differences per browser
  - Nowadays: more standardised

Browser is accessible via JavaScript:

- Functions `window.*` - access to the browser itself
  - Address bar, history state, browser properties etc.
- Functions `document.*` access to the page inside the browser





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Methods on `document`

- Some important and well-known methods on document:
  - `document.getElementById();`
  - `document.createElement();`
  - `document.createTextNode();`
  - `document.getElementsByTagName();`
  - `document.getElementsByClassName();`

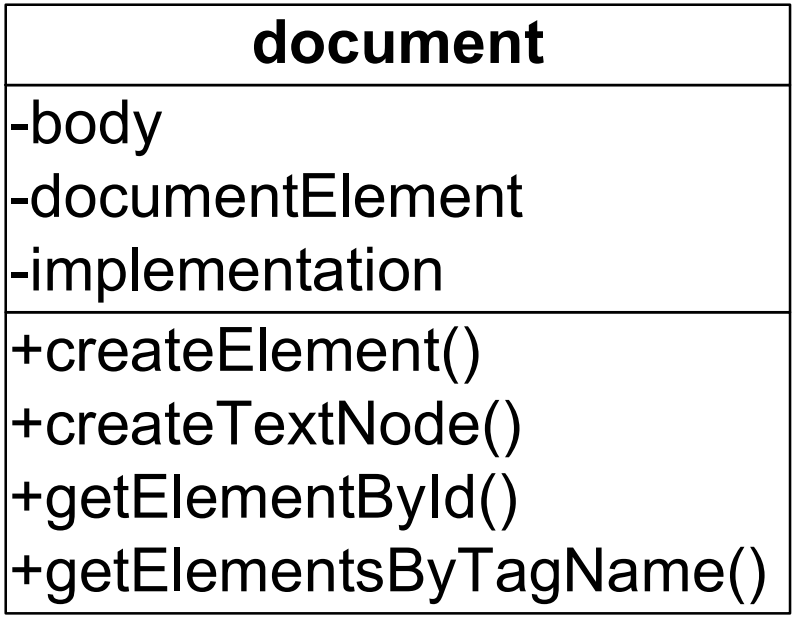
More document methods

- Also:
  - `.getElementsByClassName()`
  - `.getElementsByTagName()`
- Important:
  - `.querySelector()`
  - `.querySelectorAll()`
- Deprecated:
  - `document.write(); // Don't use!`

DOM - usage

- Manipulate the page
  - Add and remove text, images, links, etc.
  - Change properties of elements (visibility, position, color, etc).
- Create webapplications instead of static web*sites*
- External communication:
  - via http/AJAX - communication with a webserver
  - via events - interaction with the user

Document Object Model



Document Object Model

Every element (`p`, `h1`, `a` etc) is of type `DOMNode`.

It has a – really long – list of properties

DOMNode
-parentNode -firstChild -lastChild -nextSibling -previousSibling -innerHTML -data -id -nodeName -nodeValue -NodeType -specified -tagName -title -className -currentStyle -style
+getElementsByTagName() +appendChild() +cloneNode() +insertBefore() +removeChild() +replaceChild() +hasChildNodes() +getAttribute() +removeAttribute() +setAttribute() +addEventListener() +addEvent() +removeEvent() +removeEventListener()

Example – methods on `window` object

```
// 1. When entering the page.
window.addEventListener('load', function () {
    alert('Hello visitor, the page is now loaded. Have fun!');
});

// 2. When leaving the page.
window.addEventListener('beforeunload', function (event) {
    // Cancel the event, so a popup is shown
    // Most of the times, we CAN NOT set a message ourselves.
    event.preventDefault();
    // Chrome requires returnValue to be set
    event.returnValue = '';
});
```

Sample output

50_windowEvent.html

Example – methods on the `document` object

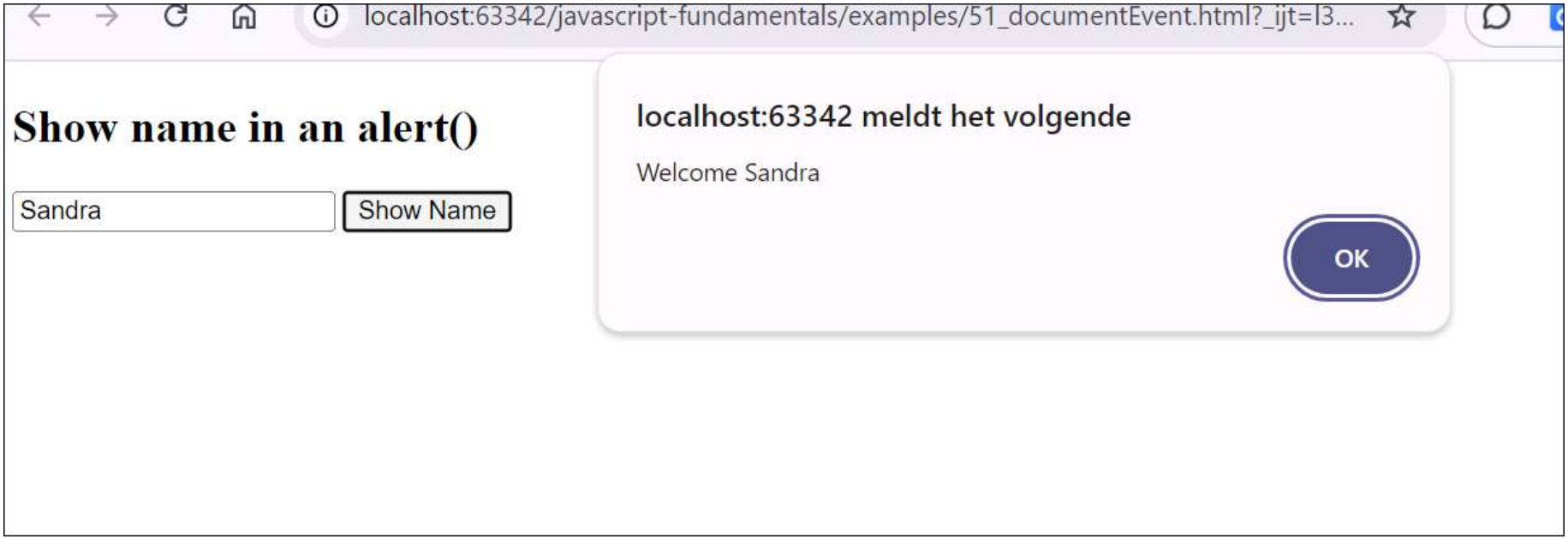
Script

```
// Note - the usage of event listeners inside eventlisteners.
window.addEventListener('load', function () {
    document.getElementById('btnShowName')
        .addEventListener('click', function () {
            const name = document.getElementById('txtName').value;
            const message = 'Welcome ' + name;
            alert(message);
        });
});
```

HTML

```
<h2>Show name in an alert()</h2>
<input type="text" id="txtName" placeholder="Please type your name"/>
<button id="btnShowName">Show Name</button>
```

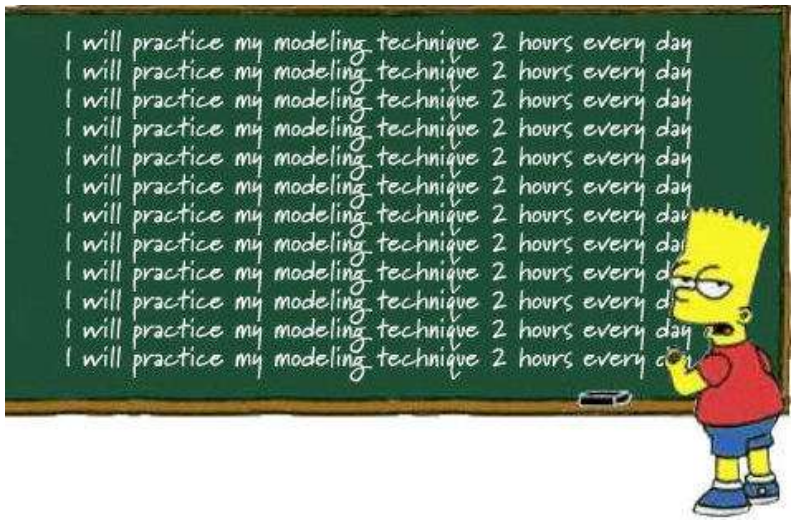
Sample output



51_documentEvent.html

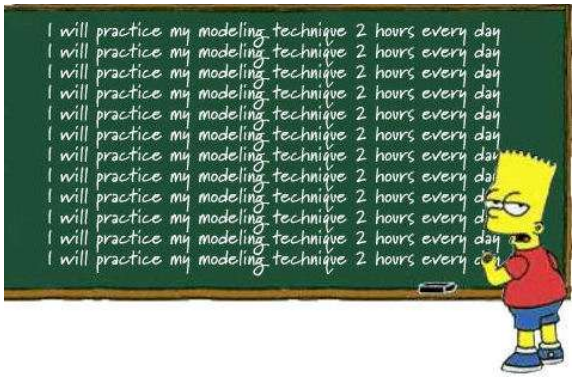
Mini workshop

- Update the script from the previous page so that:
  - A name MUST be entered, otherwise an error message is shown
  - The name must be at least 2 characters in length
  - The name is shown inside the page, instead of an `alert()` window

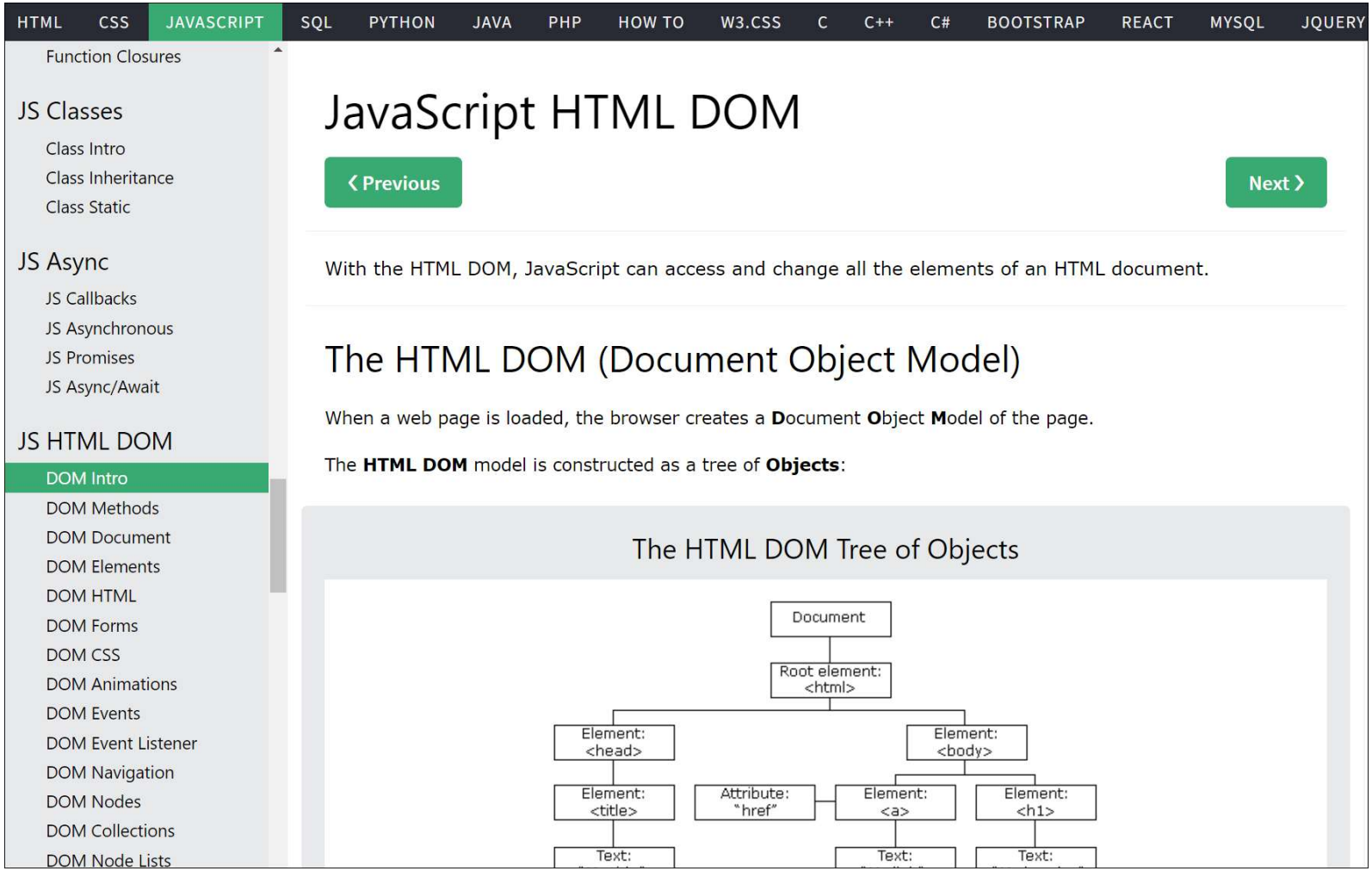


Mini workshop

- Create a script with an ‘unclickable’ link
  - How irritating…
- If the mouse hovers over the link, show an alert `‘this is to close!’`
- Tip: listen for the `mouseover` event on the link or surrounding `<div>`.
- Variant: let the link disappear when the mouse hovers over it.



Further reading



https://www.w3schools.com/js/js_htmldom.asp

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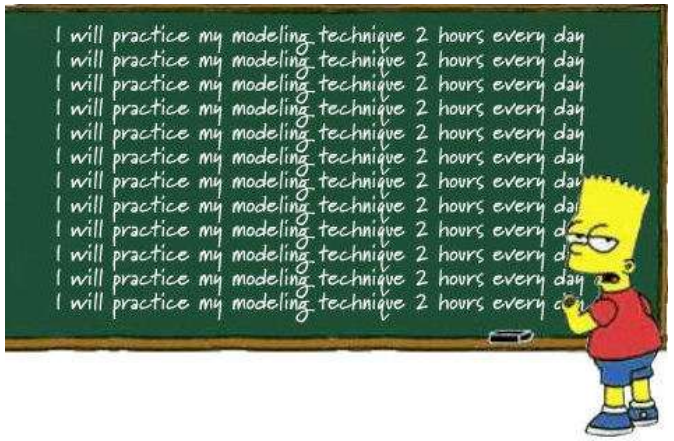
Workshop #20

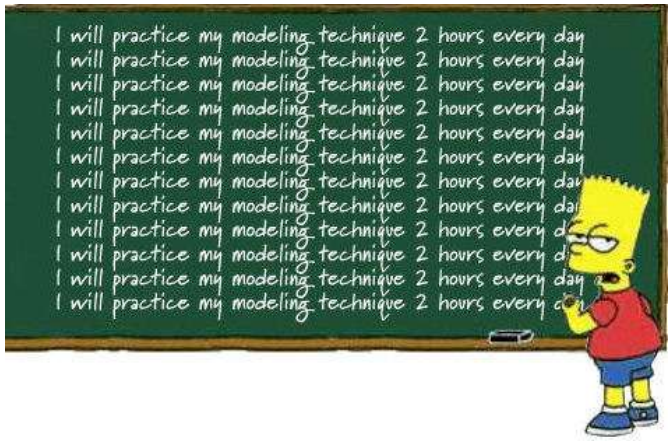
- Write a script that adds a paragraph to a page greeting the visitor.
- The greeting depends on time of day: good morning, good afternoon, good evening, good night.
- Use:
  - `new Date().getHours()`
  - `document.createElement()`
  - `.textContent or .innerHTML`
  - `document.getElementById('xxx')`
    `.appendChild();`



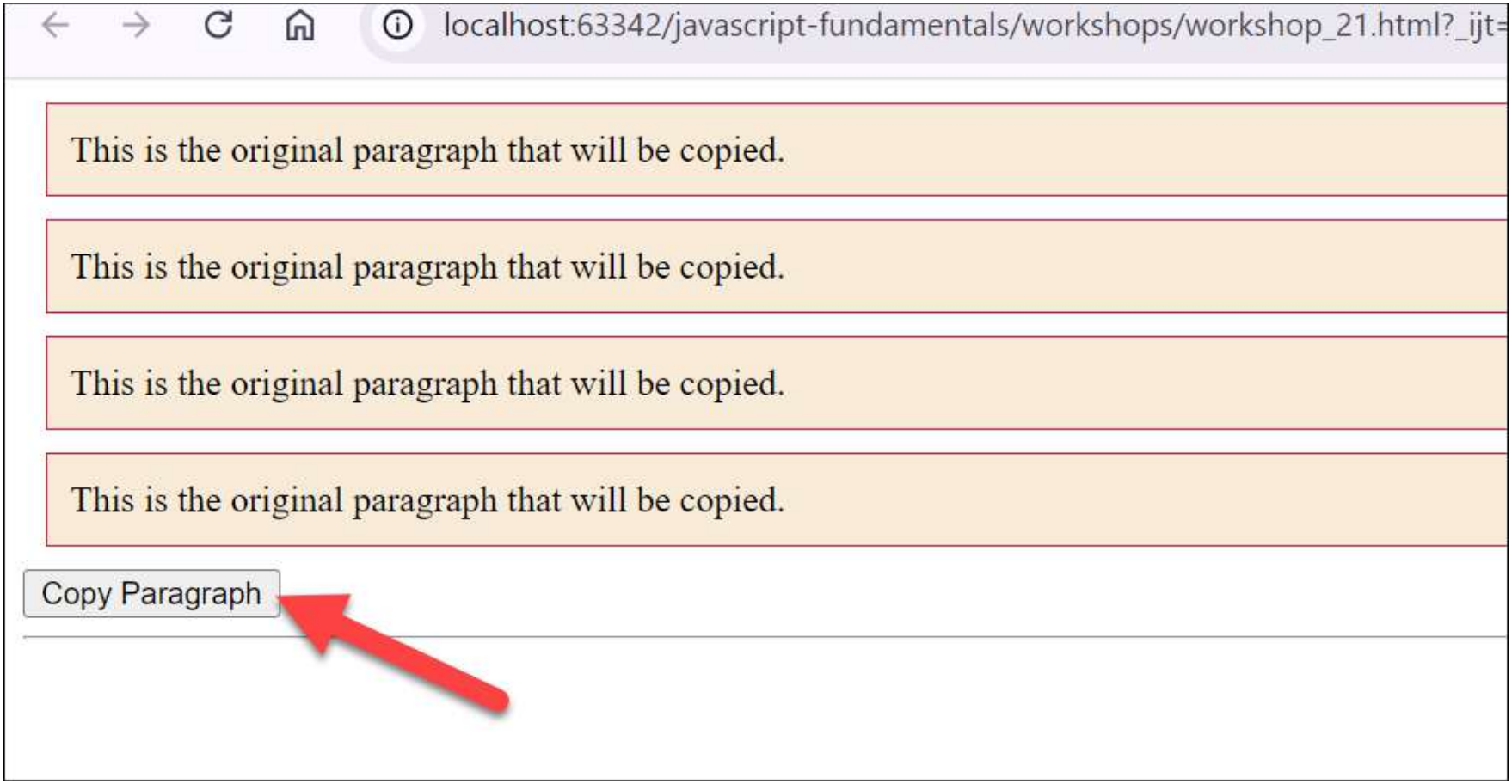
Sample output

Workshop #21

- Write a script that copies a paragraph and pastes the copy below the original
- use:
  - `document.getElementById('xxx').cloneNode();`
  - Property `nextSibling`
  - Also look at : `insertBefore();`
- Look up documentation yourself!



Sample output



insertAfter?

There is no `insertAfter` method. It can be emulated by combining the `insertBefore` method with `nextSibling`.

In the previous example, `sp1` could be inserted after `sp2` using:

```
1   parentDiv.insertBefore(sp1, sp2.nextSibling);
```

https://developer.mozilla.org/en-US/docs/Web/API/Node.insertBefore