JavaScript

Lab 4

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# Executing a JavaScript program

There are a multitude of ways to execute a JavaScript program.

1. Using the Node.js runtime environment to directly execute a JavaScript program
2. Including JavaScript into a HTML document
3. Running JavaScript in console tab of Dev Tools
4. Using an online JavaScript playground
5. Using a framework that is based on JavaScript (e.g. Angular, React, Vue)

We have already seen the first approach in the previous lab sessions. We will look at some of the other approaches here.

## Including JavaScript into a HTML document

For JavaScript referenced from within a HTML document that is loaded in the browser, there are 2 ways to perform simple text output for debugging purposes:

* Using alert('*message to display*'); method of the Window global object which causes an alert box to appear with the message.
* Using console.log('*message to display*'); where the message appears in the console tab of Dev tools

<https://www.tutorialrepublic.com/javascript-tutorial/javascript-get-started.php>

Files to use:

demo-embed-javascript.html

demo-include-javascript.html

hi-there.js

demo-inline-javascript.html

## Placement of JavaScript tag

Recommendation for including in <head> tag along with defer and async attributes properly

<https://stackoverflow.com/questions/436411/where-should-i-put-script-tags-in-html-markup>

<https://flaviocopes.com/javascript-async-defer/#just-tell-me-the-best-way>

## Typing JavaScript code directly into the console tab

<https://developer.chrome.com/docs/devtools/console/javascript/>

<https://www.digitalocean.com/community/tutorials/how-to-use-the-javascript-developer-console>

## Using an online JavaScript playground

<https://linuxhint.com/top-five-javascript-playgrounds/>

# JavaScript Document Object Model (DOM)

<https://www.javascripttutorial.net/javascript-dom/>

<https://www.javascripttutorial.net/javascript-dom/document-object-model-in-javascript/>

<https://www.w3schools.com/js/js_htmldom_document.asp>

# Selecting elements

<https://www.w3schools.com/js/js_htmldom_elements.asp>

## getElementById

<https://www.javascripttutorial.net/javascript-dom/javascript-getelementbyid/>

Files to use: demo-getElementById.html

## querySelector, querySelectorAll, Nodelist

<https://www.javascripttutorial.net/javascript-dom/javascript-queryselector/>

<https://www.w3schools.com/jsref/met_document_queryselectorall.asp>

The argument passed to the querySelector / querySelectorAll method is any one of the valid CSS selectors:

<https://www.tutorialrepublic.com/css-tutorial/css-selectors.php>

<https://code.tutsplus.com/tutorials/the-30-css-selectors-you-must-memorize--net-16048>

The value returned from a call to querySelectorAll is a NodeList

<https://www.w3schools.com/jsref/dom_obj_html_nodelist.asp>

Difference between NodeList and a HTMLCollection

<https://www.w3schools.com/jsref/met_document_queryselectorall.asp>

Each object in the NodeList is a HTML Element object. A summary of the properties and methods available on each object is shown here:

<https://www.w3schools.com/jsref/dom_obj_all.asp>

The complete list of properties and methods for the HTMLElement object can be found at the official MDN documentation:

<https://developer.mozilla.org/en-US/docs/Web/API/HTMLElement>

<https://developer.mozilla.org/en-US/docs/Web/API/Element>

Files to use: demo-querySelectorAll.html

## getElementsByName, getElementsByTagName, getElementsByClassName()

<https://www.javascripttutorial.net/javascript-dom/javascript-getelementsbyname/>

<https://www.javascripttutorial.net/javascript-dom/javascript-getelementsbytagname/>

<https://www.javascripttutorial.net/javascript-dom/javascript-getelementsbyclassname/>

Files to use: demo-getElementsByName.html

# Traversing Elements

<https://www.javascripttutorial.net/javascript-dom/javascript-siblings/>

<https://www.javascripttutorial.net/javascript-dom/javascript-get-parent-element-parentnode/>

<https://www.javascripttutorial.net/javascript-dom/javascript-get-child-element/>

Files to use: demo-traverseElements.html

# Working with attributes

<https://www.javascripttutorial.net/javascript-dom/html-attributes-dom-object-properties/>

<https://www.w3schools.com/html/html_form_attributes.asp>

<https://www.tutorialrepublic.com/html-tutorial/html-attributes.php>

<https://developer.mozilla.org/en-US/docs/Web/API/HTMLInputElement>

<https://www.w3schools.com/jsref/dom_obj_text.asp>

<https://www.javascripttutorial.net/javascript-dom/javascript-setattribute/>

<https://www.javascripttutorial.net/javascript-dom/javascript-getattribute/>

Files to use: demo-objectProperties.html

# Manipulating element’s styles

<https://www.javascripttutorial.net/javascript-dom/javascript-style/>

<https://www.w3schools.com/cssref/>

<https://www.tutorialrepublic.com/css-reference/css3-properties.php>

Files to use: demo-changeStyles.html

# Manipulating elements

<https://www.w3schools.com/js/js_htmldom_html.asp>

## createElement, appendChild, innerHTML, textContent, innerText

<https://www.javascripttutorial.net/javascript-dom/javascript-createelement/>

<https://www.javascripttutorial.net/javascript-dom/javascript-appendchild/>

<https://www.javascripttutorial.net/javascript-dom/javascript-textcontent/>

<https://www.javascripttutorial.net/javascript-dom/javascript-innerhtml/>

Key differences between using innerHTML and createElement when creating new HTML content

<https://www.javascripttutorial.net/javascript-dom/javascript-innerhtml-vs-createelement/>

Files to use: demo-create-inner.html

## insertBefore, insertAfter, append, prepend

<https://www.javascripttutorial.net/javascript-dom/javascript-insertbefore/>

<https://www.javascripttutorial.net/javascript-dom/javascript-insertafter/>

<https://www.javascripttutorial.net/javascript-dom/javascript-append/>

<https://www.javascripttutorial.net/javascript-dom/javascript-prepend/>

Files to use: demo-insert.html

## replaceChild, cloneNode, removeChild

<https://www.javascripttutorial.net/javascript-dom/javascript-replacechild/>

<https://www.javascripttutorial.net/javascript-dom/javascript-clonenode/>

<https://www.javascripttutorial.net/javascript-dom/javascript-removechild/>

Files to use: demo-replace-remove.html

# Working with events

<https://www.javascripttutorial.net/javascript-dom/javascript-events/>

<https://www.javascripttutorial.net/javascript-dom/handling-events-in-javascript/>

Files to use: basic-event-handling.html

## Mouse events

<https://www.javascripttutorial.net/javascript-dom/javascript-mouse-events/>

For difference between the different location-related coordinates accessible from the event object:

<https://stackoverflow.com/questions/6073505/what-is-the-difference-between-screenx-y-clientx-y-and-pagex-y>

<https://www.codetd.com/en/article/12514516>

General outline for manipulating the DOM

* Select an event to listen for and an element on which that event can occur on
* Register an event handler to perform some action on the DOM when the event happens. Actions can involve:

1. Selecting a particular element (Section 2. Selecting Elements)
2. Manipulating the element in some way (Section 4. Manipulating elements)
3. Changing the attributes of the element (Section 5. Working with Attributes)
4. Changing the styling of the element (Section 6. Manipulating the Element's styles)

Files to use: basic-mouse-handling.html

## Sample DOM manipulation with mouse events

Demonstration of more complex DOM manipulation based on mouse events

Files to use: more-mouse-handling.html

## Keyboard events

<https://www.javascripttutorial.net/javascript-dom/javascript-keyboard-events/>

Files to use:

basic-keyboard-handling.html

more-keyboard-handling.html