CS7025 Programming for Digital Media

Lesson 4 – DOM Manipulation

Semicolon

In Javascript the semicolon ';' is optional. It is good practice however to end a statement with one, to increase legibility of your code and to avoid confusion;

Don't use a semicolon when:

▶ Declaring a function	`function doSomething(){}`
▶ A conditional comparison	`if(true){}else{}`
▶ A loop	`for(let i=0; i<5; i++){}`

Scope

Variables should only be accessible within scope;

```
let students = 31;
function countAbsentStudents(){
    let absent = 3;
    students -= absent;
}
countAbsentStudents();
console.log("students", students);
console.log("absent", absent); //throws error: absent is not defined
```

Events

Events are the things that are happening on your web page or in your application.

Examples:

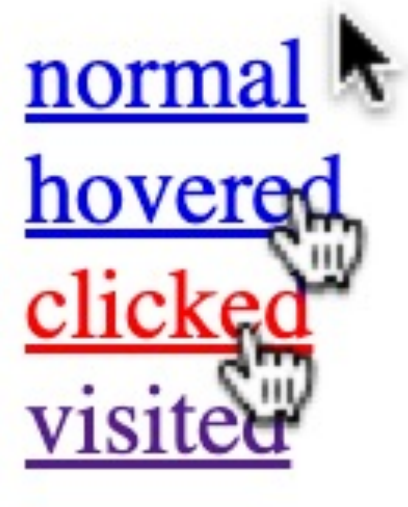
- Loading a page
- Clicking on a hyperlink
- Entering text in a text field / pressing keys on the keyboard
- Checking a checkbox
- Submitting a form

State

State goes hand in hand with events. Events usually alter the state of your web page or application. State is whatever describes the UI at a given point in time or when you are in control of your own states, a specific stage of a process.

In the case of a hyperlink for instance, it can be

- 'normal' the link is there but no interaction
- 'hovered' the mouse cursor is over the link
- 'clicked'
- 'visited'



The Document Object Model

The Document Object Model (DOM) represents the structure of a document (HTML).

```
<!DOCTYPE html>
<html lang="en">
    <head>
        <meta charset="UTF-8">
        <meta name="viewport" content="width=device-width, initial-scale=1.0">
        <title>Document</title>
    </head>
    <body>
    </body>
</html>
```

Manipulating the DOM

Let the browser wait with executing code within scope until the document is completely loaded into memory

```
document.addEventListener("DOMContentLoaded", () => {
    //do things
});
```

Manipulating the DOM

Traversing the DOM

```
<body>
    <div id="shopping_list">
        <ul id="items">
            <li class="item">item 1</li>
            <li class="item">item 2</li>
            <li class="item">item 3</li>
        </ul>
    </div>
</body>
```

`li.item` is a child of `ul#items` which is a child of `div#shopping_list` which is a child of `body`

Manipulating the DOM

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

The dot notation is used to traverse through the DOM

```
document.querySelector('#theSelector');
```

In English:

"Of the document object, use the query selector for the element with an ID of 'theSelector' "

Manipulating the DOM

Different ways of addressing elements within the DOM

```
getElementById()
// <div id="student"></div> document.getElementById('student');

getElementsByClassName()
// <div class="student"></div> document.getElementByClassName('student');

getElementsByName()
// <input type="text" name="up" /> document.getElementsByName('up');

getElementsByTagName()

// <h1>A Title</h1>  document.getElementsByTagName('h1');

querySelector()
// <div id="student"></div> document.querySelector('#student');

querySelectorAll()
// <div class="student"></div> <div id="location">…</div>
// document.querySelectorAll('.student #location');
```

Manipulating the DOM

Adding and removing elements

The way to add new elements to your document is by creating a new element (store it in memory)

```
let paragraph = document.createElement("p");
```

```
paragraph.textContent = "Hello World!";
```

And then add it to the document (make it available)

```
document.body.appendChild(paragraph);
```

To remove an element, use the `remove()` function:

```
document.getElementById(<THE ID>).remove();
```

Manipulating the DOM

Attributes

```
<div id="students" class="cs7025" data-counter="3">…</div>
```

Get the value of an attribute by invoking the `getAttribute(attribute)` function

Set the value of an attribute by invoking the `setAttribute(name, value)` function

```
document.getElementById('students').setAttribute('id','teachers');
```

Manipulating the DOM

Read data from an external JSON file

```
let dataSource = "externalFile.json";

fetch(dataSource)
    .then((response) => {
        return response.json();
    })
    .then((data) => {
        // now you have the json data, so this is the place where
        // you can work with it
    })
    .catch((err) => {…});
```

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Manipulating the DOM

Read data from an external API

```
let dataSource = "https://newsapi.org/v2/everything?q=<TOPIC>&from=<YYYY-MM-
DD>&sortBy=publishedAt&apiKey=<API_KEY>";

fetch(dataSource)
    .then((response) => {
        return response.json();
    })
    .then((data) => {
        // now you have the json data, so this is the place where
        // you can work with it
    })
    .catch((err) => {…});
```

jQuery

write less, do more.

Third party library jQuery which uses css selectors to address elements in the DOM

https://jquery.com/

```
document.querySelector('.student')
```

```
$('.student')
```

```
button.addEventListener('click',
(event)=>{
    …
});
```

```
$(document).on('click','button',
()=>{
    …
});
```

Try it yourself

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Thank You

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