SOEN 287

Chapter 5: JavaScript and HTML Documents (1)

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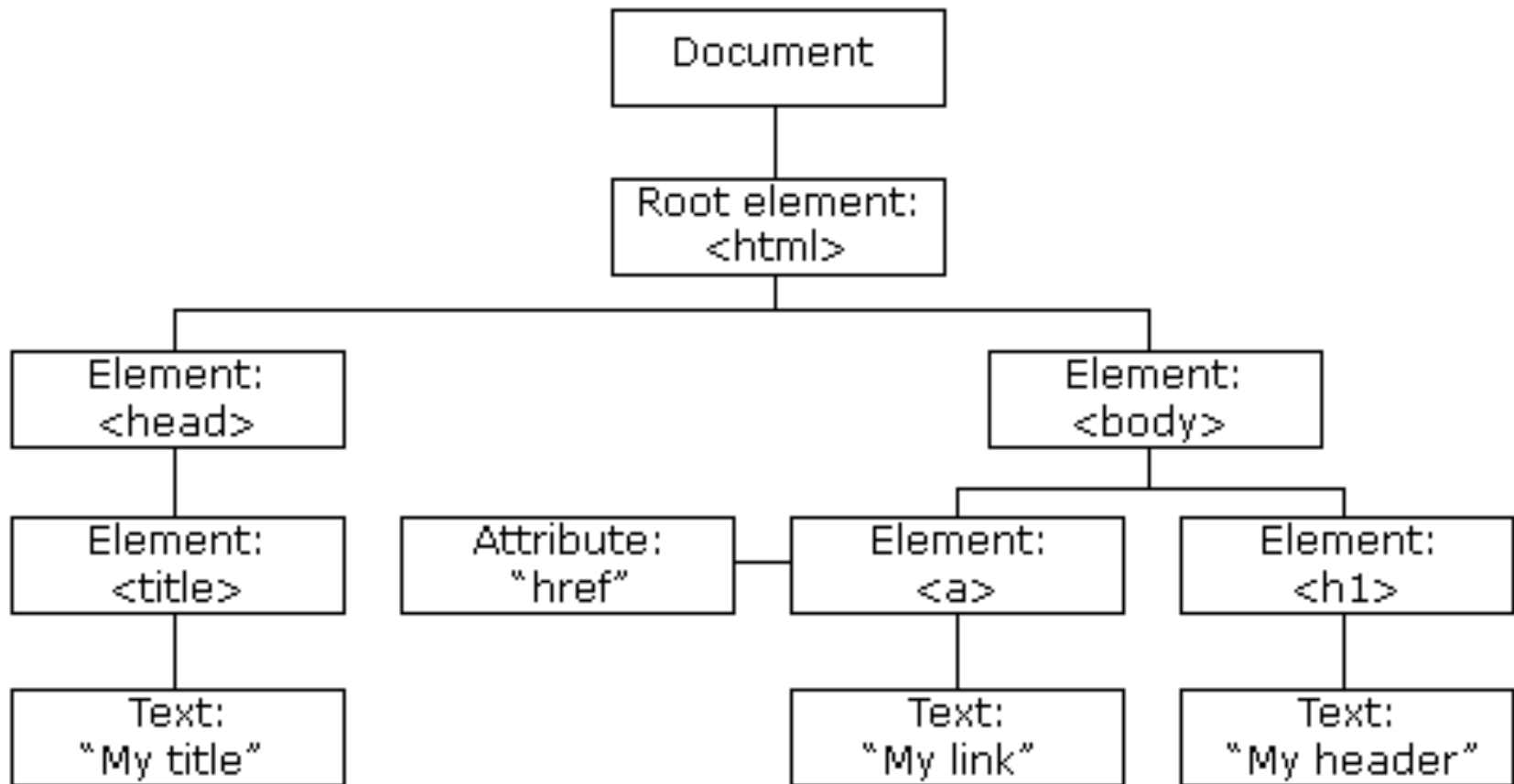**CSE, Concordia University**

Winter 2023

Topics

- The DOM model
- Element Access
- Event handling
- The DOM2 Event Modal

DOM history

- DOM 0 is supported by all JavaScript-enabled browsers (no written specification)
- DOM 1 was released in 1998
- DOM 2 was released in 2000
- DOM 3 is the latest approved standard (2004)

DOM – Document Object Model

```
                        ┌─────────────────┐
                        │    Document     │
                        └────────┬────────┘
                                 │
                        ┌─────────────────┐
                        │ Root element:   │
                        │    <html>       │
                        └────────┬────────┘
                    ┌────────────┴─────────────────┐
            ┌───────────────┐              ┌───────────────┐
            │  Element:     │              │  Element:     │
            │   <head>      │              │   <body>      │
            └───────┬───────┘              └───────┬───────┘
                    │                 ┌────────────┼────────────┐
        ┌───────────────┐   ┌──────────────┐  ┌──────────┐  ┌──────────┐
        │  Element:     │   │  Attribute:  │──│ Element: │  │ Element: │
        │   <title>     │   │   "href"     │  │   <a>    │  │  <h1>    │
        └───────┬───────┘   └──────────────┘  └─────┬────┘  └─────┬────┘
                │                                    │            │
        ┌───────────────┐                   ┌──────────────┐ ┌──────────────┐
        │    Text:      │                   │    Text:     │ │    Text:     │
        │  "My title"   │                   │  "My link"   │ │ "My header"  │
        └───────────────┘                   └──────────────┘ └──────────────┘
```

What JavaScript Can do?

- Change HTML elements
- Change HTML attributes
- Change CSS styles
- Remove existing HTML elements and attributes
- Add new HTML elements and attributes
- React to all existing HTML events in the page
- Create new HTML events in the page

JavaScript Execution Environment

- `Window` object: the window in which the browser displays document

- `Window` properties:
  - `document` - a reference to the `Document` object that the window displays

**Browser Objects Reference &
HTML DOM Objects Reference:
http://www.w3schools.com/jsref/default.asp**

JavaScript Execution Environment

- `Document` object

  - `forms` - an array of references to the forms of the document
  - Each `Form` object has an `elements` array, which has references to the form's elements
  - `Document` also has `anchors, links, images, …`

Document Reference:
http://www.w3schools.com/jsref/dom_obj_document.asp

Element Access in JavaScript

```
<form name = "myForm" action = "">
    <input type = "button"  name = "pushMe">
</form>
```

- Dom address

```
document.forms[0].elements[0]
```

Problem: document changes

- Element names: require to have have name attributes

```
document.myForm.pushMe
```

Problem: HTML 1.1 spec doesn't allow the name attribute on form elements

Element Access in JavaScript (3)

```
<form id = "topGroup">
  <input type = "checkbox"  name = "toppings"
         value = "olives" />
  ...
  <input type = "checkbox"  name = "toppings"
         value = "tomatoes" />
</form>
```

- Checkboxes and radio buttons have an implicit array, which has the same name as the group name

```
let numChecked = 0;
const dom = document.getElementById("topGroup");
for (index = 0; index < dom.toppings.length;
    index++)
  if (dom.toppings[index].checked)
    numChecked++;
```

Find HTML Element

- getElementById()
- getElementsByTagName()
- getElementsByClassName(*name*)

Change Style

```
document.getElementById(id).style.property = new style
```

```html
<p id="p2">Hello World!</p>

<script>
document.getElementById("p2").style.color = "blue";
</script>
```

The End