

Module 3 - Lecture 8

# Document Object Model



# The DOM

- An in-memory representation of a web page's structure.
- Generated by the browser from an HTML document.

```
<body>
  <p>
    This is a paragraph. And it has <strong>bold</strong>
    elements and <em>emphasized</em> elements.
  </p>
</body>
```

HTML

```
<!DOCTYPE html>
<html lang="en">
  <head> ... </head>
  <body>
    <p>
      This is a paragraph. And it has
      <strong>bold</strong>
      elements and
      <em>emphasized</em>
      elements.
    </p>
  </body>
</html>
```

DOM

This is a paragraph. And it has **bold** elements and *emphasized* elements.

Graphical View



# The DOM

- The DOM may be different than your HTML.
- CSS uses the DOM.

```
<table class="table">
  <tr>
    <td>Tech Elevator</td>
    <td>7100 Euclid Ave.</td>
  </tr>
</table>
```

```
▼ <table class="table">
  ▼ <tbody>
    ▼ <tr>
      <td>Tech Elevator</td>
      <td>7100 Euclid Ave.</td>
    </tr>
  </tbody>
</table>
```



# DOM Manipulation



# Finding element(s)

- **getElementById(*String*);**

- Finds an element by its unique identifier. Faster than `querySelector`.
- Returns an `Element`. Returns null if not found.

```
let element = document.getElementById('someId');
```

- **querySelector(*String*);**

- Selects the first descendant element that matches the selector. Selectors are CSS selectors.
- Returns an `Element`. Returns null if not found.

```
let element = document.querySelector('ul > li');
```

- **querySelectorAll(*String*);**

- Selects all descendant elements that match the selector.
- Returns a `NodeList`.

```
let nodeList = document.querySelectorAll('ul > li');
```



# Changing Elements

Changing how an element renders in the browser requires manipulating the element. This will update the DOM and force the browser to re-render.

- **innerText**

- The text inside of an element.
- All text (including HTML tags) is replaced.
- All text is treated a string literal. HTML is not interpreted.

- **innerHTML**

- The HTML inside of an HTML.
- All text (including HTML tags) is replaced.
- HTML is interpreted.
- Do not use with user input!

# Getting and Setting input values

Most input elements have a property **value** that contains the current value of the element. Checkboxes have a property **checked**.

- **Get the value of a textbox named “todo”**

```
let todoInput = document.querySelector('input[name=todo]');  
let val = todoInput.value;
```

- **Set the value of a textbox**

```
todoInput.value = 'Wash the car';
```

- **Check a checkbox if it isn't checked.**

```
let isFinished = document.querySelector('input[type=checkbox]');  
if (isFinished.checked) {  
    isFinished.checked = true;  
}
```

# Manipulating Classes

Elements have a property **classList** that is a collection of its classes.

- Recall that HTML tags can have multiple classes listed in class attribute. The element below has 2 classes.

```
<p class="paragraph main-content">  
    Some text here...  
</p>
```

The **classList** property is a [DOMTokenList](#).

- You may add a class using the **add()** method.

```
const mainParagraph = document.querySelector('.main-content');  
mainParagraph.classList.add('new-class');
```

- You may remove a class using the **remove()** method.

```
const mainParagraph = document.querySelector('.main-content');  
mainParagraph.classList.remove('new-class');
```



# Adding to the DOM

- *document*.**createElement**(*String*)

- Creates a new Element.
- It is not in the DOM at this point.

```
const newDiv = document.createElement('div');  
newDiv.setAttribute('id', 'myNewDiv');  
newDiv.classList.add('container');
```

- *targetElement*.**appendChild**(*Element*)

- Adds *Element* as the last child of *targetElement*.
- *Element* is now in the DOM and will be rendered.

```
const sectionElement = document.querySelector('section');  
sectionElement.appendChild(newDiv);
```

# Adding to the DOM

- *targetElement.insertAdjacentElement(position, Element)*
  - Adds *Element* at the specified position.
  - *position* can be one of the following:
    - 'beforebegin' - Before the *targetElement*
    - 'afterbegin' - Inside of the *targetElement* before its first child.
    - 'beforeend' - Inside of the *targetElement* after its last child.
    - 'afterend' - After the *targetElement*

# Removing from the DOM

- *targetElement.removeChild(Node)*
  - Removes a child node from the current element
- *targetElement.remove()*
  - Removes the element from the tree it belongs to

# Traversing the DOM

- *targetElement*.**children** returns child elements.
  - Returns an [HTMLCollection](#).
  - Only includes Elements.
- *targetElement*.**childNodes** returns all nodes/elements inside.
  - Returns a [NodeList](#).
  - Includes Elements and text content.

```
<p id="message">  
  This is an <strong>awesome</strong> paragraph.  
  <!-- with a comment -->  
</p>
```

# Traversing the DOM

- *targetElement*.**parentNode**
  - Returns the parent Node.
- *targetElement*.**nextElementSibling**  
*targetElement*.**previousElementSibling**
  - Returns the sibling of *targetElement*.
  - Returns null if *targetElement* doesn't have a sibling.

QUESTIONS?

