Introduction to Web Design & Computer Principles
CSCI-UA 4

JavaScript
Introduction
JavaScript

You can think of a web page as consisting of three layers: structure, presentation, and behavior

- HTML is the structure layer
- CSS is the presentation layer
- JavaScript is the behavior layer

JavaScript is a programming language for creating interactivity and functionality in web browsers
JavaScript

Background

JavaScript was invented by Brendan Eich and introduced by Netscape in 1995.

At that time, the Java language was ascendant and the name “JavaScript” was an attempt to ride this popularity.

Eventually, browsers other than Netscape began to support JavaScript functionality, calling it “ECMAScript”.

Today, JavaScript is not only a lingua franca of the Web but a basis for many other computational media projects.
JavaScript Application

As with CSS, JavaScript targets HTML elements to do something with them.

There are three ways you can apply JavaScript to HTML:

• Inline JavaScript

• Embedded JavaScript

• External JavaScript

External and embedded JavaScript are preferable for their separation of content and behavior.
JavaScript
Front-End Language

Like HTML and CSS, JavaScript is usually rendered in the web browser.

Because it’s rendered in the browser rather than on a server, JavaScript is considered a “front-end language”.

A browser’s “JavaScript engine” interprets and executes JavaScript code in the browser.

There are different JavaScript engines for different web browsers.
Computationally speaking, there isn’t much JavaScript can’t do; it’s a robust programming language.

Core functionality includes modifying HTML and CSS, communicating with the server, and storing data.

We will use JavaScript to modify page content and style, and for interactivity.

As with any technology, it’s good to consider when to—and not to—use it.
Introduction to Web Design & Computer Principles
CSCI-UA 4

JavaScript
Document Object Model
When a browser loads a web page, it creates a model of that page.

This is called a “DOM tree” and it is stored in the browser’s memory.

Every element, attribute, and piece of text in the HTML is represented by its own “DOM node”.
Document Object Model

Types of DOM Nodes

There are four main types of nodes.

• The Document node, which represents the entire page

• Element nodes, which represent individual HTML tags

• Attribute nodes, which represent attributes of HTML tags, such as class

• Text nodes, which represent the text within an element, such as the content of a p tag

We talk about the relationship between element nodes as “parents,” “children,” and “siblings.”
<html>
  <head>
    <title>New York University</title>
  </head>

  <body>
    <h1>Intro to Web Design</h1>

    <p>In this lecture-based course you will learn how to build websites.</p>

    <p>Class notes are available <a href="notes.html">here</a>.</p>
  </body>
</html>
In this lecture-based course . . .

Class notes are available here.
This course . . .
Class notes are . . .
here
Document Object Model

DOM Queries

JavaScript methods that find elements in the DOM tree are called “DOM queries”

DOM queries may return one element, or they may return a “node list”

Which DOM query you use depends on what you want to do and the scope of browser support required
Document Object Model

DOM Queries

JavaScript methods that return a single element node:

• `getElementById()`
• `querySelector()`
Document Object Model

DOM Queries

JavaScript methods that return one or more elements as a node list:

- `getElementsByClassName()`
- `getElementsByTagName()`
- `querySelectorAll()`