

JavaScript: BOM and DOM

CS 4640 Programming Languages for Web Applications

[Robert W. Sebesta, “Programming the World Wide Web
Jon Duckett, Interactive Frontend Web Development]

Web Browsers and Objects

The image shows a web browser window displaying the syllabus for CS 4640: Web PL. Two callout boxes are overlaid on the page:

- Object type: Window**
 - Properties**
 - Location:** <http://www.cs.virginia.edu/~up3f/cs4640/syllabus.html>
- Object type: Document**
 - Properties**
 - URL:** <http://www.cs.virginia.edu/~up3f/cs4640/syllabus.html>
 - lastModified:** 05/21/2022 20:24:21
 - Title:** CS4640 - WebPL

The browser window shows the following content:

CS 4640: Web PL Syllabus Schedule Assignments Policies

Do users look at web apps the way they are? Or do users look at web apps the way they think?

Summer 2022 — Syllabus

Note: This is an initial course description and may be updated without prior notice.

COVID-19 Course Policy

In this course, we will diligently follow all University policy, while also requesting that we respect and care for each other (and our families).

For now:

- Although masking is not mandatory, I would like to encourage you, and if at all possible, to **please wear a mask** in class for the duration of the class meeting
- No eating or drinking** in Thornton Hall D222

General information:

- Class will be recorded (refer to [Class recordings](#) for more information)
- If you feel **unwell**:
 - Please stay home, rest, and watch the class recordings; the most importance is your health and everyone's health
 - I will happily work with you — if you stay home — to make sure there is no impact to your grade
- If you have any questions or concerns before or after class, the best way to reach me is via email.

Contact information

Instructor: Upsorn Praphamontripong
Office Hours: *TBD*

Class meetings

Monday – Friday and one Saturday (18-June), 1:00pm – 3:15pm EST, Thornton Hall D222
(Please refer to the [Summer session calendar](#): Class meets 23-May - 17-June)

[**You** are the main driver!]

[Is attendance required?]

Class recordings

My current plan is to record synchronous lectures during the official meeting times and you will be able to catch up by viewing the recording. The recordings will be available under Class Recordings in [UVA Collab](#), accessible by Summer 2022 CS 4640 students and course staff. By default, the recordings will be made available within 24-48 hours after class. If the recordings are unavailable due to technical difficulty or any unavoidable reasons, I will happily work with you to make sure that you do not miss anything.

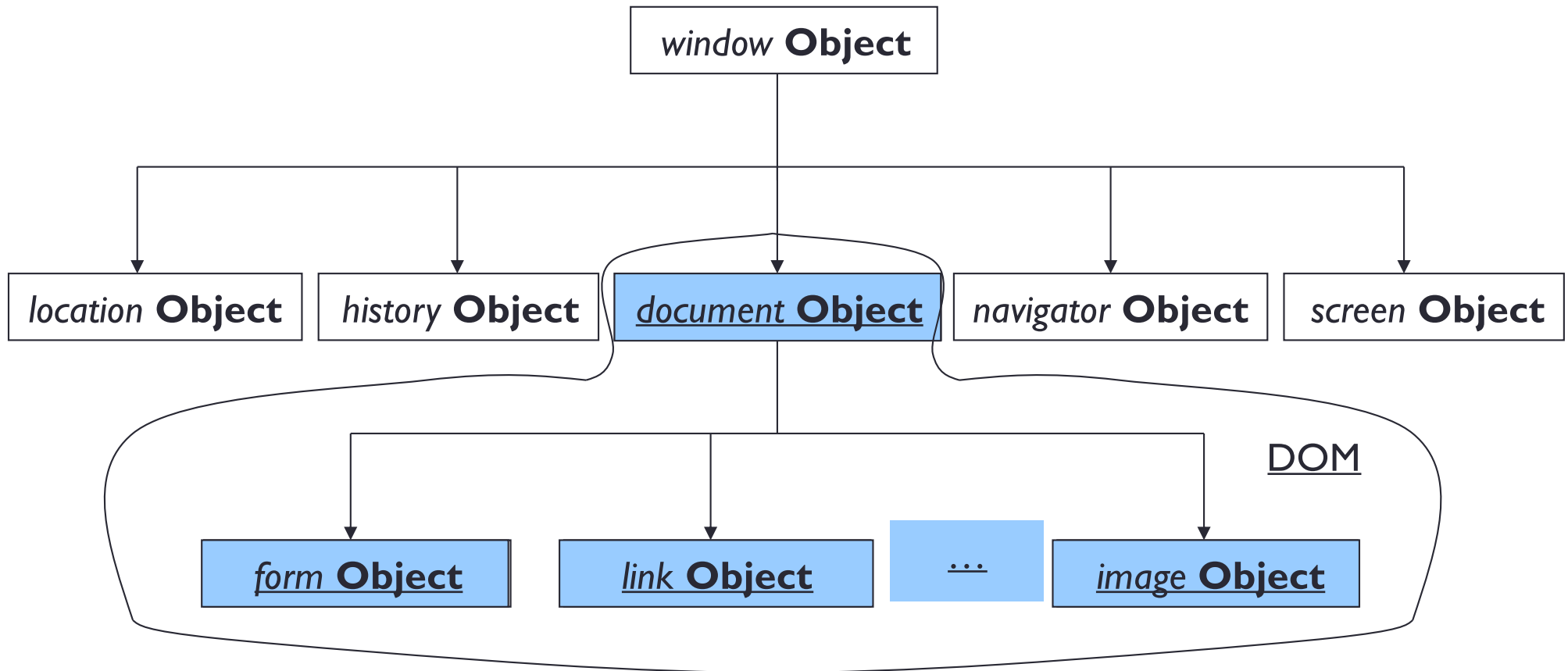
Per [UVA policy on recording of class sessions](#), the University prohibits the recording of class sessions by students, regardless of purpose or modality. Students are **not** allowed to record class sessions / meetings / discussions, regardless of purpose or modality. "The University prohibits the recording of class sessions by students, regardless of purpose or modality, unless written permission has been obtained from the instructor, and all students in the class as well as guest speakers have been informed that recording will occur. Instructors may revoke permission at any time, and permission to allow a recording is not a transfer of any copyrights in the recording."

Overview

Have you ever wondered how web applications are built? How are data exchanged within web software or between web software? How does the software know where each user left off? What can be done to improve the usability of web software? Many new technologies have emerged everyday. With what technologies or languages should you be familiar? How will you keep up with web development technologies?

BOM: Browser Object Model

- BOM – collection of objects that the browser makes available to us for use with JavaScript



DOM: Document Object Model

CS4640 - WebPL

www.cs.virginia.edu/~up3f/cs4640/syllabus.html

50%

CS 4640: Web PL

Syllabus Schedule Assignments Policies

Summer 2022 — Syllabus

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COVID-19 policy
Contact
Class meetings
Overview
Learning objectives
Prerequisite
Reading
Learning activities
Assessment
Discussion board
Academic integrity
SDAC and other special circumstances
Religious accommodations
Safe environment
Student support team

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Properties

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 lastModified: 05/21/2022 20:24:21
 Title: CS4640 - WebPL

Event

Happens when

Load

page and content have finished loading

Click

user clicks the mouse over the page

Keypress

user presses down on a key

Method

What it does

write()

adds content to the document

getElementById()

accesses an element of a given *id* attribute

CS 4640: Web PL

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The browser receives an HTML page

It creates a model of the page and stores it in memory

container
bottom ...

It shows the page on screen using a rendering engine

contact
information

Using BOM Objects (Some Properties)

Property	Description
<code>window.screenX</code>	X-coordinate of pointer, relative to top left corner of screen (in pixels)
<code>window.screenY</code>	Y-coordinate of pointer, relative to top left corner of screen (in pixels)
<code>window.location</code>	Current URL of window object
<code>window.document</code>	Reference to document object
<code>window.history</code>	Reference to history object for browser window or tab, which contains details of the pages that have been viewed in that window or tab
<code>window.history.length</code>	Number of items in history object
<code>window.screen</code>	Reference to screen object
<code>window.screen.width</code>	Accesses width property of screen object
<code>window.screen.height</code>	Accesses height property of screen object

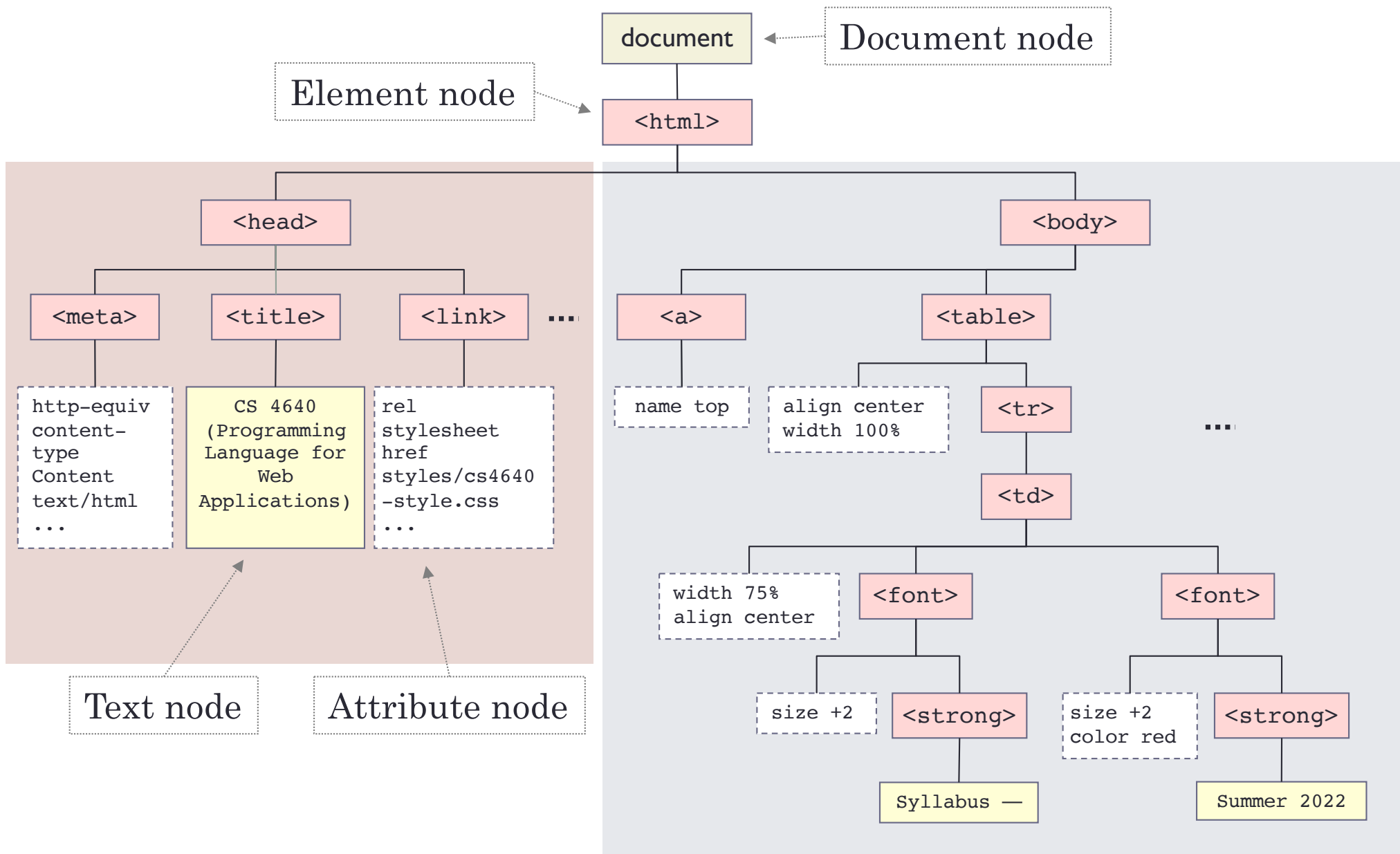
Using BOM Objects (Some Methods)

Method	Description
<code>window.alert()</code>	Create modal dialog box with message (user must click OK button to close it)
<code>window.open(url)</code>	Open new browser window with the specified URL
<code>window.print()</code>	Tell browser that user wants to print contents of current page (act like user has clicked a print option)
<code>window.history.back()</code>	Move backward through history
<code>window.history.forward()</code>	Move forward through history
<code>window.history.go(step)</code>	Move to specific page from session history (step specifies the number of pages, forward or backward)
<code>history.pushState(state, title, url)</code>	Create a new entry (or add a URL) at the top of the browser history
<code>history.replaceState(state, title, url)</code>	Modify the current entry (current URL at the top) of the browser history

Using DOM Objects

- Not part of HTML or JS
- Separate rules implemented by all major browser markers
- Two primary purposes:
 - Making a **model** of the HTML page
 - Specifies how browsers should create a model of an HTML page
 - **Accessing** and **changing** the HTML page
 - Specifies how JS can access and update the contents of a web page

DOM: Four Types of Nodes



Using DOM Objects

(Some Properties and Methods)

Property	Description
<code>document.title</code>	Title of current document
<code>document.lastModified</code>	Date on which document was last modified
<code>document.URL</code>	String containing URL of current document
<code>document.domain</code>	Domain of current document

Method	Description
<code>document.write()</code>	Write text to document
<code>document.getElementById(id)</code>	Return element whose id attribute matches the specified id
<code>document.querySelectorAll(selector)</code>	Return list of elements that match the specified CSS selector
<code>document.createElement(element)</code>	Create new element
<code>document.createTextNode(text)</code>	Create new text node