CSCI-UA-4-005

Intro to Web Design + Computer Principles

Final Review

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Agenda

- Review starred topics
- Go over Practice Mock Finals
- Open study

Other Topics

Page Layout/Responsive Design

Units of Length

There are two types of length units in CSS:

- `absolute`
- `relative`

Alternative specifications:

- `auto` (browser calculates length)
- `inherit` (from the parent element)

Units of Length

ABSOLUTE

`px`

RELATIVE

`%`

`em`

`rem`

For styling related to fonts, `%` and `em` are equal can be used interchangeably

For non-font-related elements, `%` is relative to parent container while `em` is related to font-size

Stands for "root em",

relative to the font size of the root element (usually the `<html>` element)

Cascade

The principle of the “cascade” is applied when style rules are in conflict

Three primary factors determine which style rule wins out:

- Inheritance
- Specificity
- Location

`srcset`

- `srcset` is an HTML image attribute that specifies the list of images to use in different browser situations.
- The browser will pick the most optimal image version, based on the screen size and resolution.

```
<img
   alt="image alt text"
   src="default url"
   srcset="
     url size,
     url size,
     url size
     "
/>
```

`srcset` + image density

- The more common way to to set include size information in the srcset attribute is to label each file by image density.
- You do this by putting 1x, 2x, 3x and so forth after the URL.

```
<img
   alt="flamingo in lake"
   src="flamingo1x.jpg"
   srcset="
     flamingo2x.jpg 2x,
     flamingo3x.jpg 3x,
     flamingo4x.jpg 4x,
     "
/>
```

`srcset` + image width

- The other way to inform the browser about the different sizes is to actually specify the image width in pixels.
- This gives the browser more information about the images, so it can make a better decision about which one to select.
- This is also good if your image versions aren't in exact proportion to each other.

```
<img
  alt="flamingo in lake"
  src="flamingo1x.jpg"
  srcset="
    flamingo2x.jpg 800w,
    flamingo3x.jpg 1200w,
    flamingo4x.jpg 1600w,
    "
/>
```

`srcset`

- An HTML image attribute that specifies the list of images to use in different browser situations.
- The browser will pick the most optimal image version, based on the screen size and resolution.

`sizes`

- Allows you to specify the layout width of the image for each of a list of media conditions
- Each condition is specified using the same conditional format used by media queries.

Using `srcset` and `sizes`

```
<img
   alt="image alt text"
   src="medium.jpg"
   srcset="
     small.jpg 240w,
     medium.jpg 300w,
     large.jpg 720w
     "
  sizes="
     (min-width: 960px) 720px
  "
/>
```

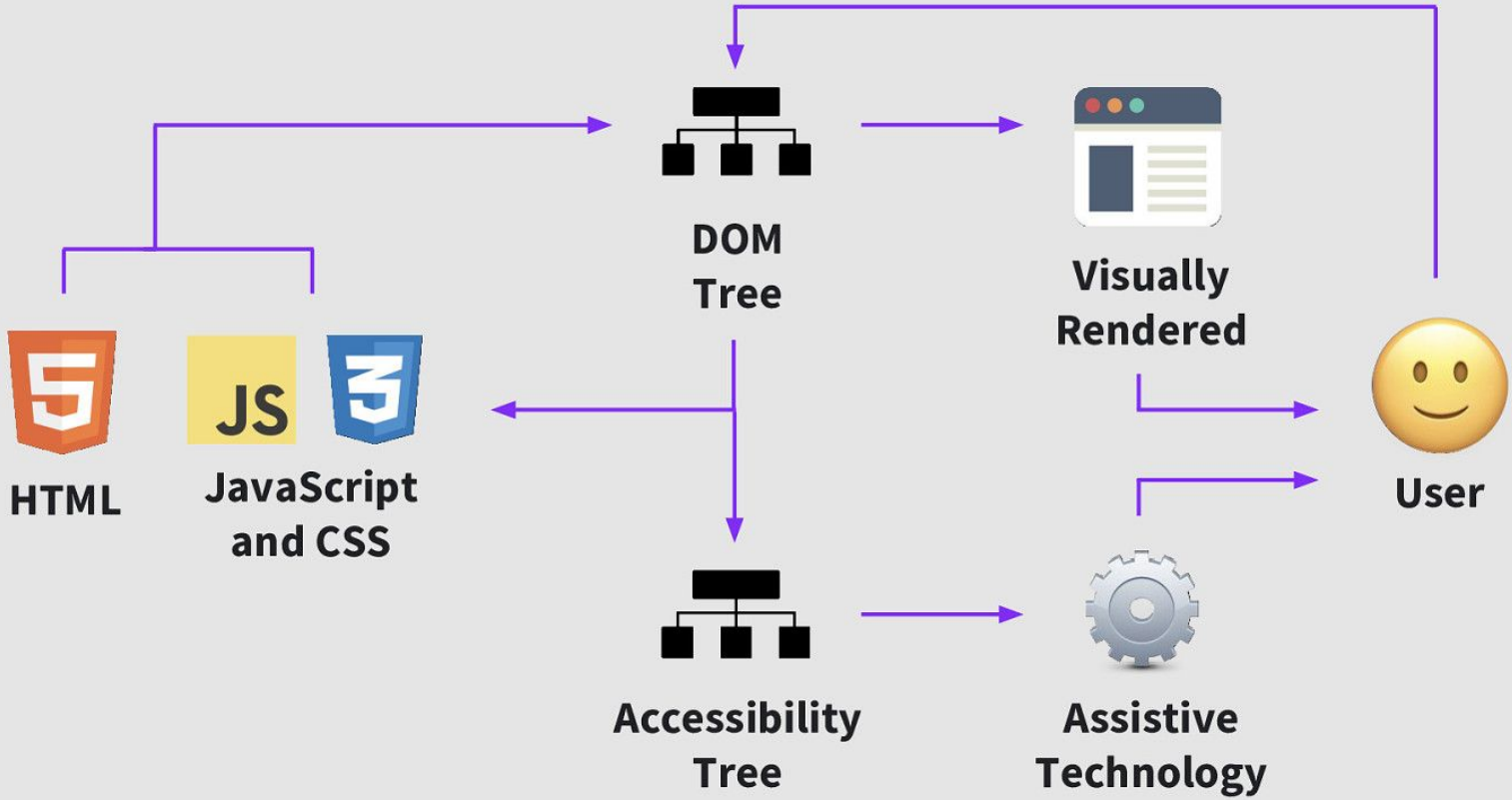
`srcset` and `sizes`

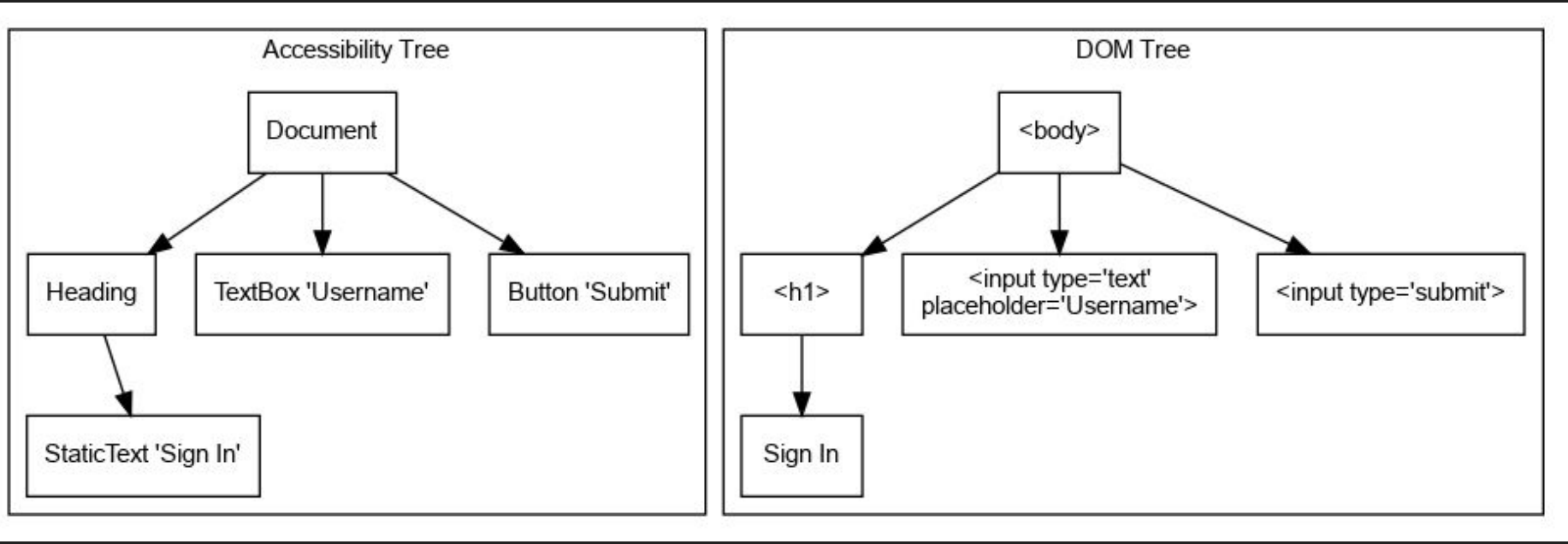
```
<img
   alt="image alt text"
   src="medium.jpg"
   srcset="
     small.jpg 240w,
     medium.jpg 300w,
     large.jpg 720w
     "
  sizes="
     (min-width: 960px) 540px
  "
/>
```

In this code, if *viewport width* equals 960px or greater, then show the image with the width of 540px.

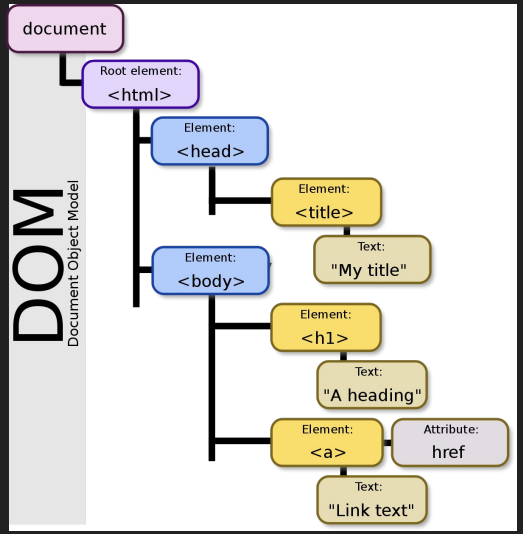
Now you may notice that in our example of srcset there's no image with a width of 540px. That's not a problem. The browser will select the best image available upwards in size. In this case, large.jpg will be used with a width of 720px.

Accessibility


DOM
Tree
Visually
Rendered
HTML
JavaScript
and CSS
User
Accessibility
Tree
Assistive
Technology


Accessibility Tree
Document
Heading
TextBox 'Username'
Button 'Submit'
StaticText 'Sign In'
DOM Tree
<body>
<h1>
<input type='text' placeholder='Username'>
<input type='submit'>
Sign In

Document Object Model (DOM)



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.”

Javascript

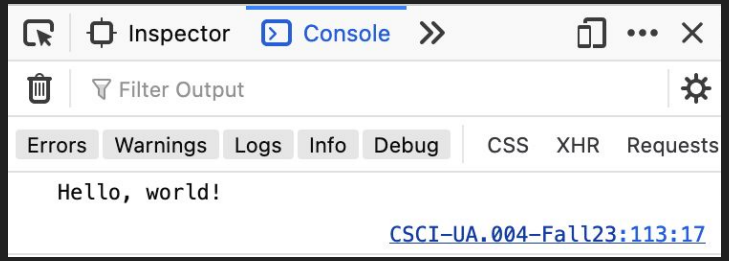
A Front-End Language

- 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 browsers.

Testing + Visualizing Our Data

`console.log()` allows you to write a message to the Javascript console in the developer tools.

```
console.log("Hello, world!");
```



`alert()` displays an alert box with message and an OK button. Only use this for special cases!

```
alert("Hello, world!");
```

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.

DOM Queries

Methods that return a single element node:

`.getElementById()`

`.querySelector()`

Methods that return one more more elements as a node list

`.getElementsByClassName()`

`.getElementsByTagName()`

`.querySelectorAll()`

Binding

Specifying which event will trigger the response is also known as “binding”.

There are three different ways to bind an event to an element:

— HTML event handler
— DOM event handler
— DOM Event listener *

* *preferred method*

HTML Event Handler

```
<button onclick="myFunction()">Click me</button>
```

***Downsides**: Mixing HTML markup with JavaScript can make the code less maintainable and harder to debug. It's generally considered a best practice to separate HTML and JavaScript code.*

DOM Event Handler

```
let btn = document.querySelector("button");
btn.onclick = myFunctionName;
```

***Downsides:** Assigning multiple event handlers to the same event on the same element will overwrite the previous assignment.*

DOM Event Listener

```
let btn = document.querySelector('button');
btn.addEventListener('click', myFunctionName);
```

***Most recommended!** They're most flexible and powerful. They allow you to attach multiple event handlers to a single event on a DOM element without overwriting existing ones.*

Forms

HTML Form

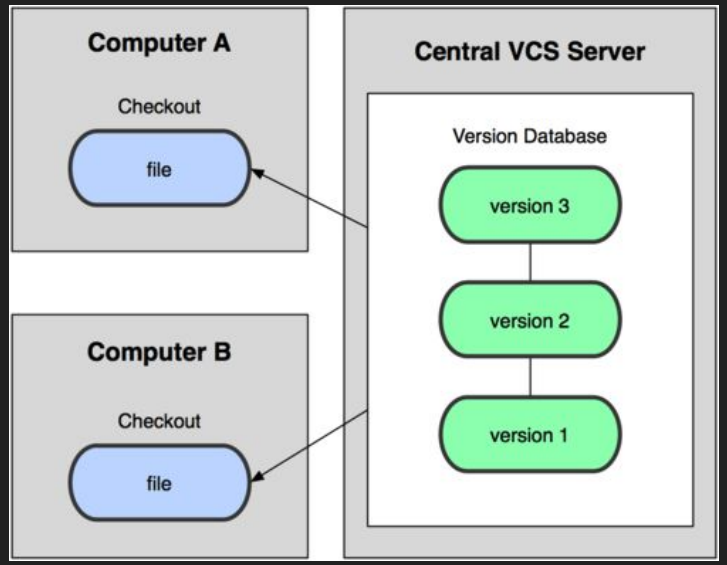
```
<form action="my-script.php">
    First name:
    <input type="text" name="firstname">
    Last name:
    <input type="text" name="lastname">
    <input type="submit" value="Submit">
</form>
```

- Forms always begin with the <form> element.
- The <form> element’s action attribute specifies how the form will be processed.
- The <input> element is used for various kinds of user input.
- The <input> element’s type attribute determines what kind of input is received from users.
- Each <input> element must also have a name attribute and value in order for the data to be sent.

Version Control

Centralized Version Control

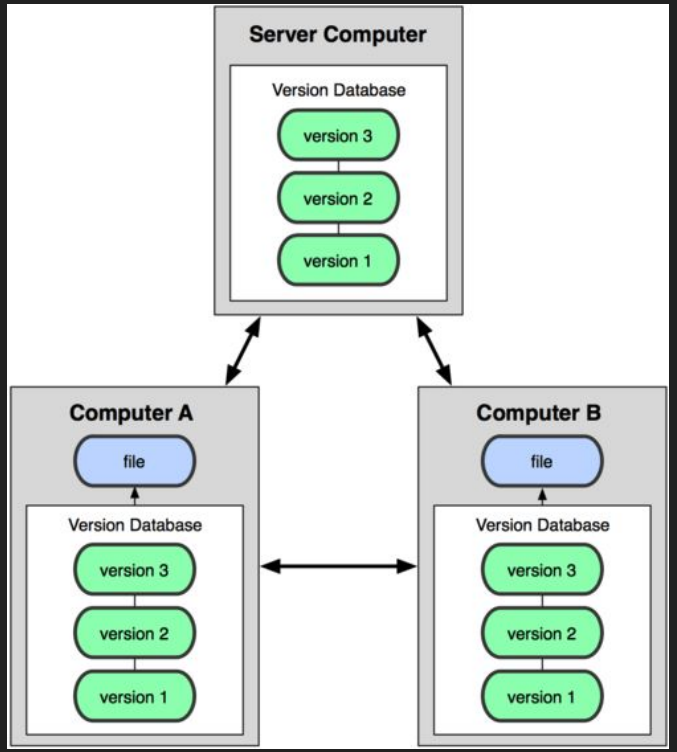
- Centralized Version Control Systems were developed to allow collaboration with developers on other systems.
- With a CVCS, a single server contains all the versioned files and clients “check out” files from that central place.
- For many years, this has been the standard for version control.
- The downside of centralized version control is the vulnerability of having the entire history of a project in one place.



Pro Git

Distributed Version Control

- With Distributed Version Control Systems, clients don’t just check out the latest snapshot of files, they fully mirror the entire history of the project.
- If a server dies, anyone with a copy of all the versioned files can restore it to the server.
- Every checkout is really a full backup of all the data.
- You can also collaborate with different groups of people in different ways simultaneously within the same project.

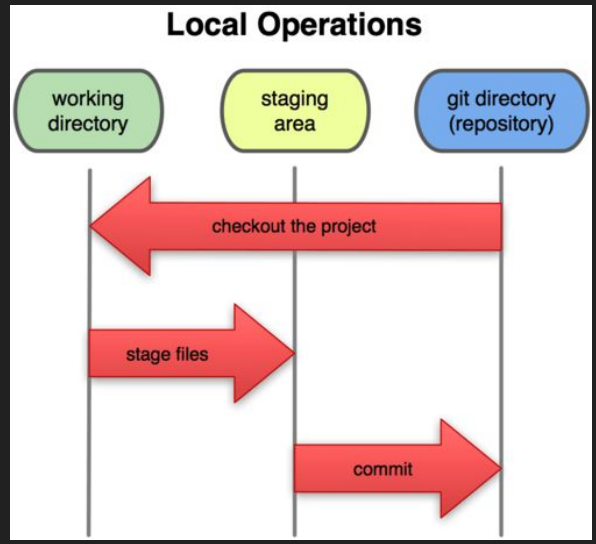


Pro Git

Git States

Git has three main states that your files can reside in: modified, staged, and committed.

- Modified means that you have changed the file but have not committed it to your database yet.
- Staged means that you have marked a modified file in its current version to go into your next commit snapshot.
- Committed means that the data is safely stored in your local database.



Homework — Study! Good luck!