Introduction to the DOM

SENG 4640
Software Engineering for Web Apps
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How do we use JavaScript and HTML?

- We motivated this part of the course by saying that we wanted a way to dynamically generate HTML

- Now that we've seen JavaScript, how can we use it to access/modify HTML elements?

- This is done by using the **DOM**

What is the DOM?

- The **D**ocument **O**bject **M**odel is a structured tree representation of a web page

- The HTML of every web page is turned into a DOM representation by the browser
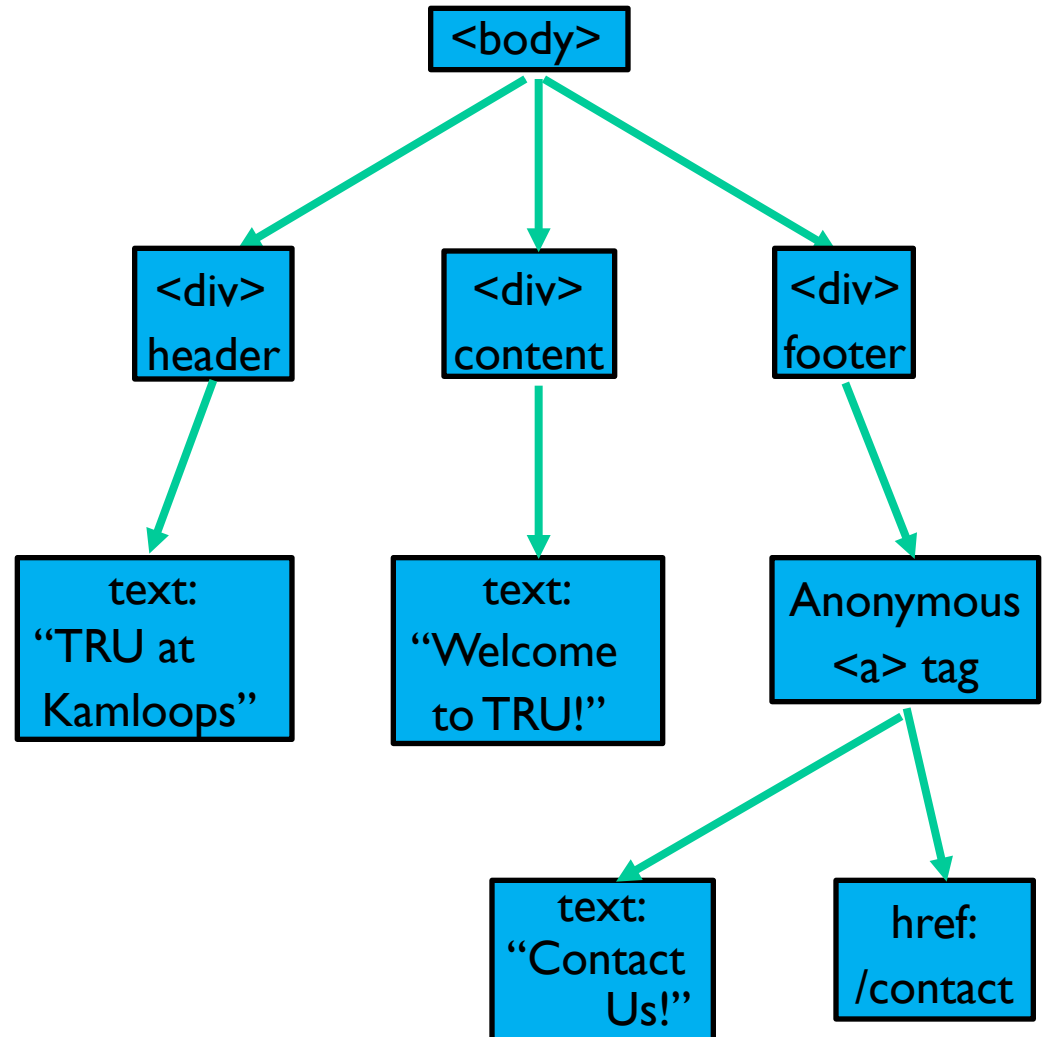
What does the DOM look like?

- HTML

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<!DOCTYPE html>
<html>
<body>
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 <div id="content">
  Welcome to TRU!
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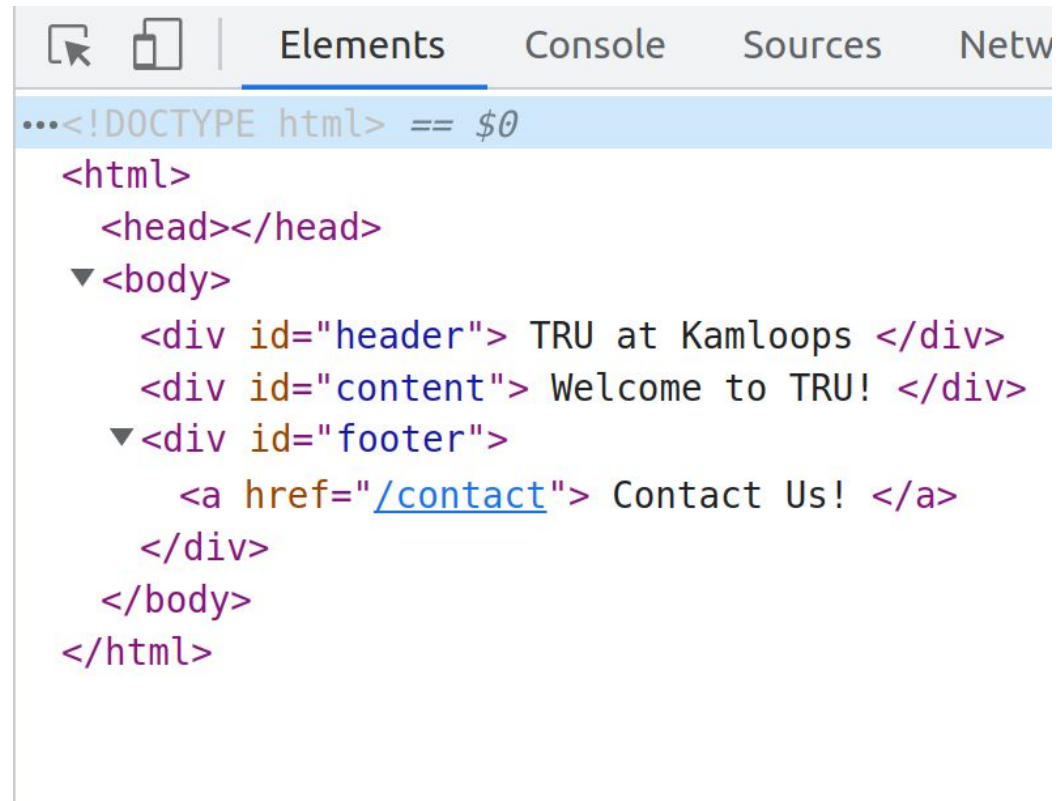
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- DOM in console

Why the DOM?

- Remember, HTML specifies the **structure** of the content on the Web page

- The DOM provides a way for us to programmatically access that structure in JavaScript

DOM Example

- The root DOM object can be accessed by the object called `document`

- Elements in this DOM tree can be retrieved and manipulated

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Objects as JSON

- JSON = **J**ava**S**cript **O**bject **N**otation

- JSON is a **textual** representation of a JavaScript Object that can be stored as a string, in a .json file, or be exchanged between programs

- A sample JSON file or string might look like this:

```
{
    "name": "John Doe",
    "age": 25,
    "isMale": true,
    "personality": ["patient", "loyal", "happy"],
    "company": { "name": "TRU", "id": 2984 }
}
```

Converting between JSON and Objects

- JavaScript objects can be converted to a JSON string via `JSON.stringify(`*`myObject`*`)`

- String representations can be converted back to an object via `JSON.parse(`*`jsonString`*`)`

- All values must be a string, number, array, boolean, null, or another valid JSON object

Storing JSON

- A great application of JSON usage is to store JSON strings in local browser storage:

```javascript
localStorage.myJSON = JSON.stringify(myObject);

// … in a later session
myObject = JSON.parse(localStorage.myJSON);
```

- Later on, as you learn about server-side JavaScript, you will also learn how to use JSON data to communicate with a server or API.

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Summary

- JavaScript can use the DOM to retrieve/modify HTML elements

  - `document.getElementById('`*`id`*`')` returns the specific HTML element with that ID

  - *`element`*`.innerHTML` can be modified to change the element's HTML/content

  - *`element`*`.style` can be modified to change the element's CSS/appearance

- We can use `localStorage` to save values across page requests

- Objects can be converted to string representations known as JSON