



Video 2.7

Chris Murphy

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

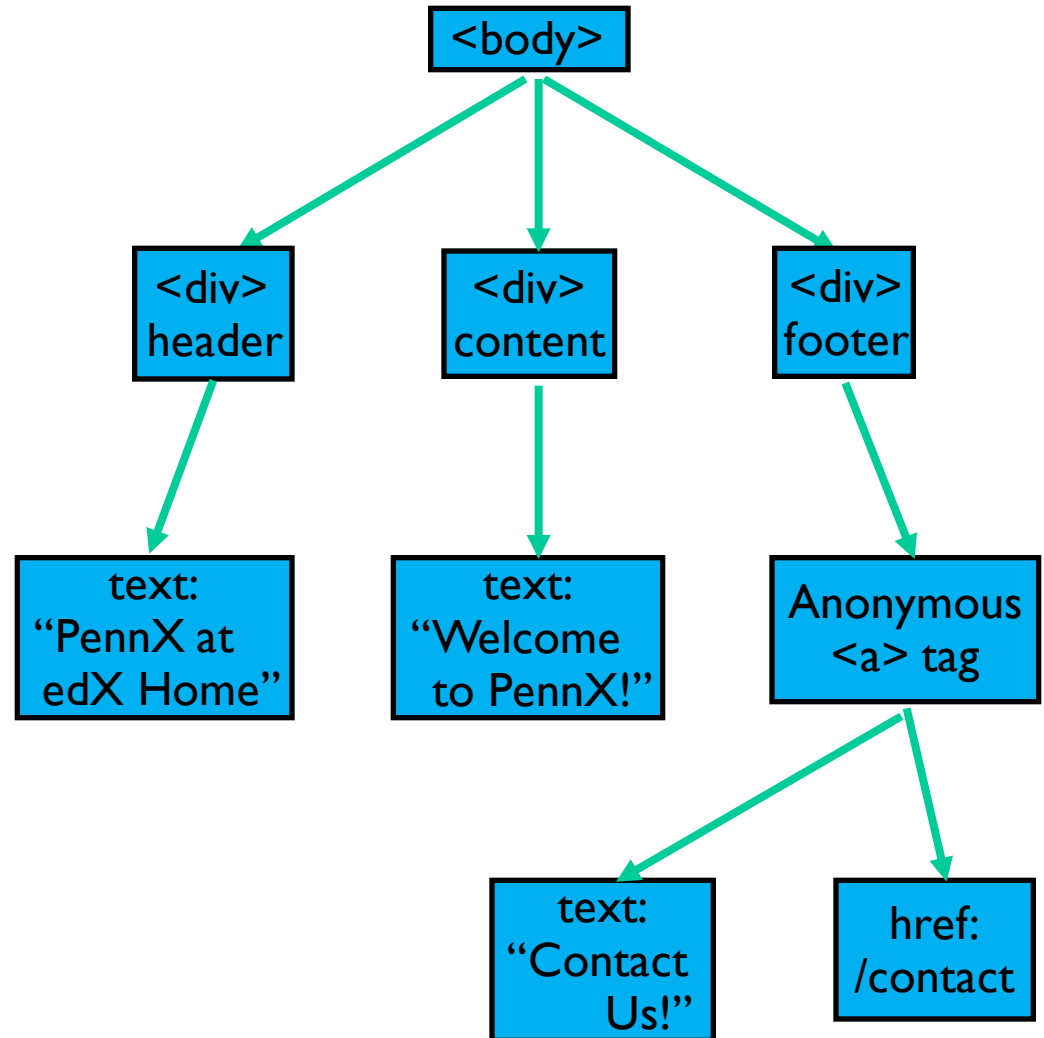
```
<!DOCTYPE html>
<html>
  <body>
    <div id="header">
      PennX at edX Home
    </div>
    <div id="content">
      Welcome to PennX!
    </div>
    <div id="footer">
      <a href="/contact">
        Contact Us!
      </a>
    </div>
  </body>
</html>
```

What does the DOM look like?

- HTML

```
<!DOCTYPE html>
<html>
  <body>
    <div id="header">
      PennX at edX Home
    </div>
    <div id="content">
      Welcome to PennX!
    </div>
    <div id="footer">
      <a href="/contact">
        Contact Us!
      </a>
    </div>
  </body>
</html>
```

- DOM tree

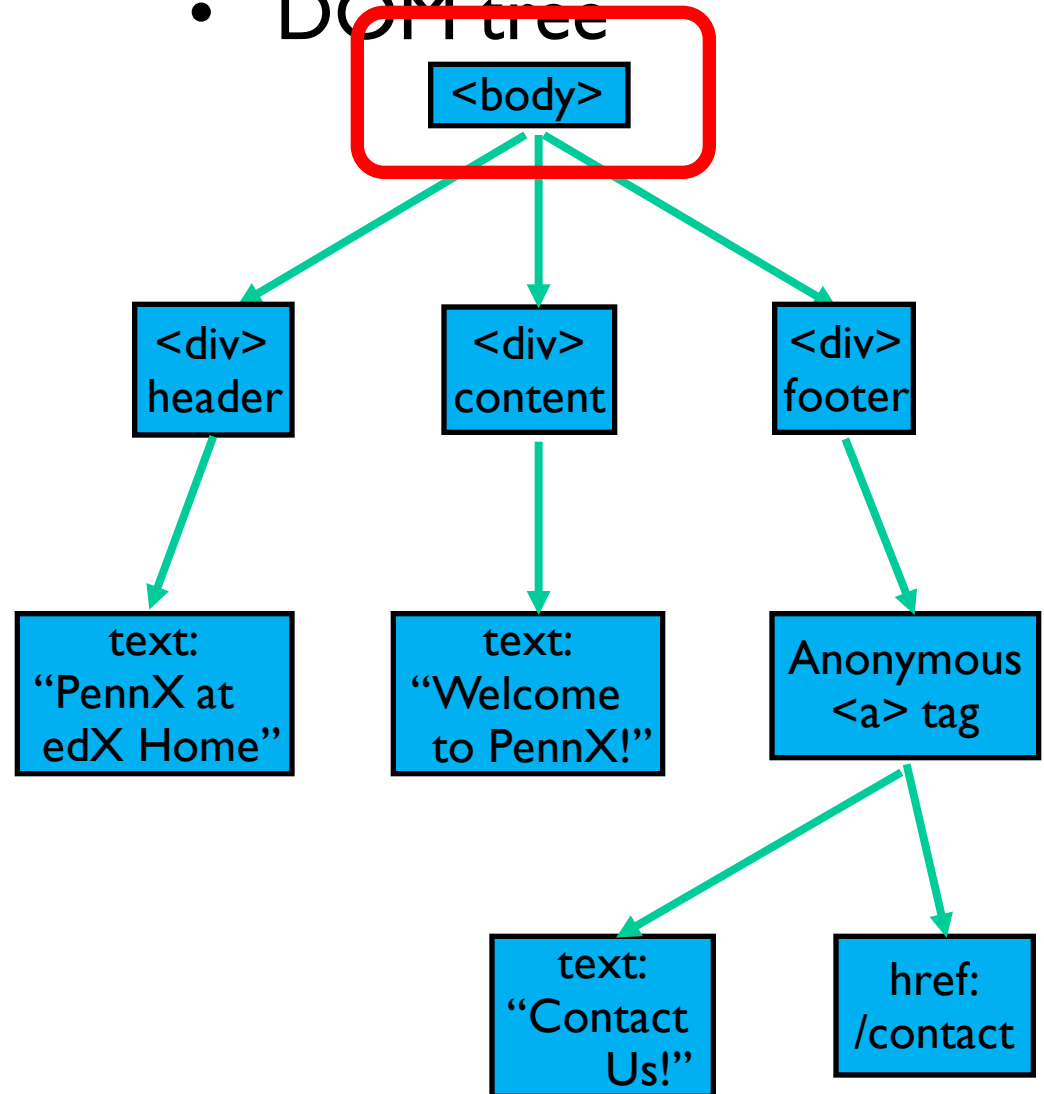


What does the DOM look like?

- HTML

```
<!DOCTYPE html>
<html>
  <body>
    <div id="header">
      PennX at edX Home
    </div>
    <div id="content">
      Welcome to PennX!
    </div>
    <div id="footer">
      <a href="/contact">
        Contact Us!
      </a>
    </div>
  </body>
</html>
```

- DOM tree

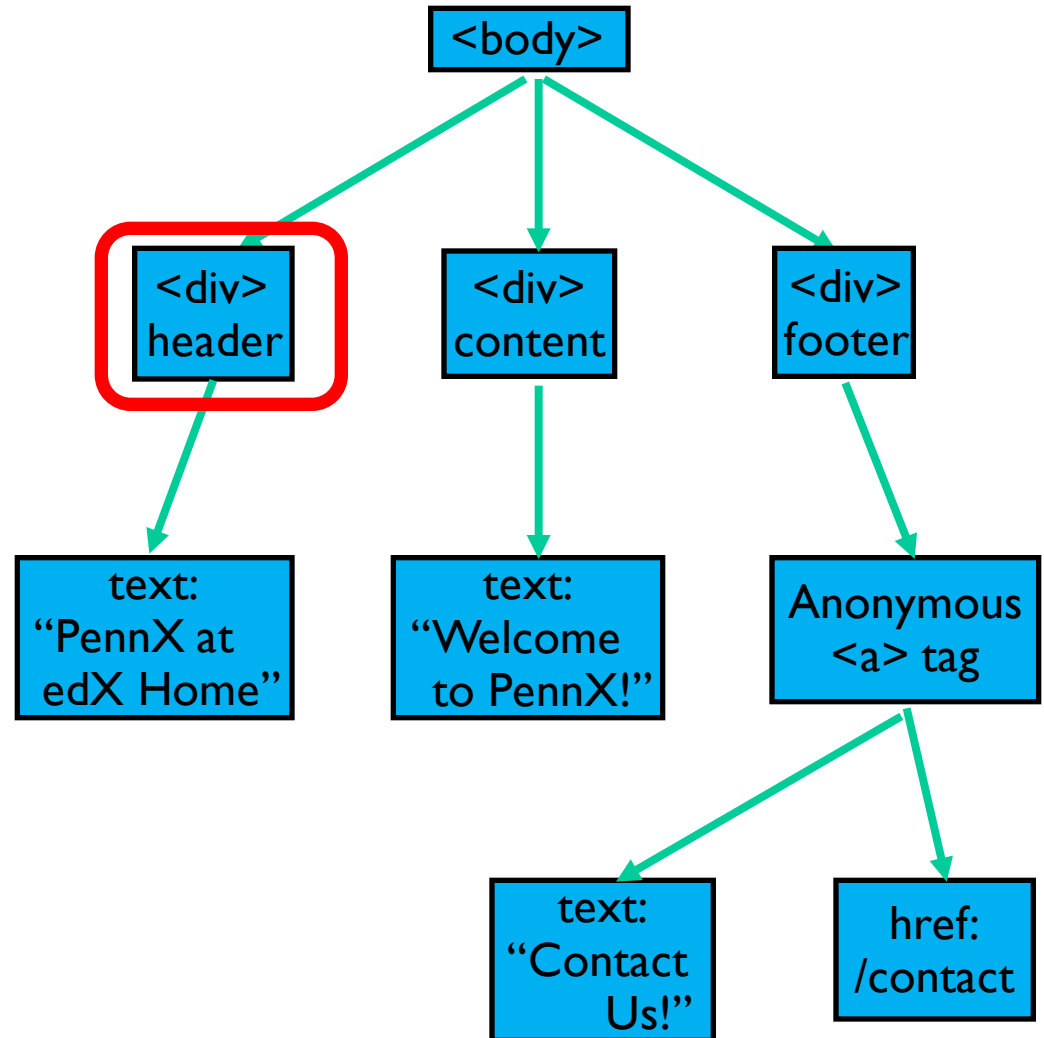


What does the DOM look like?

- HTML

```
<!DOCTYPE html>
<html>
  <body>
    <div id="header">
      PennX at edX Home
    </div>
    <div id="content">
      Welcome to PennX!
    </div>
    <div id="footer">
      <a href="/contact">
        Contact Us!
      </a>
    </div>
  </body>
</html>
```

- DOM tree

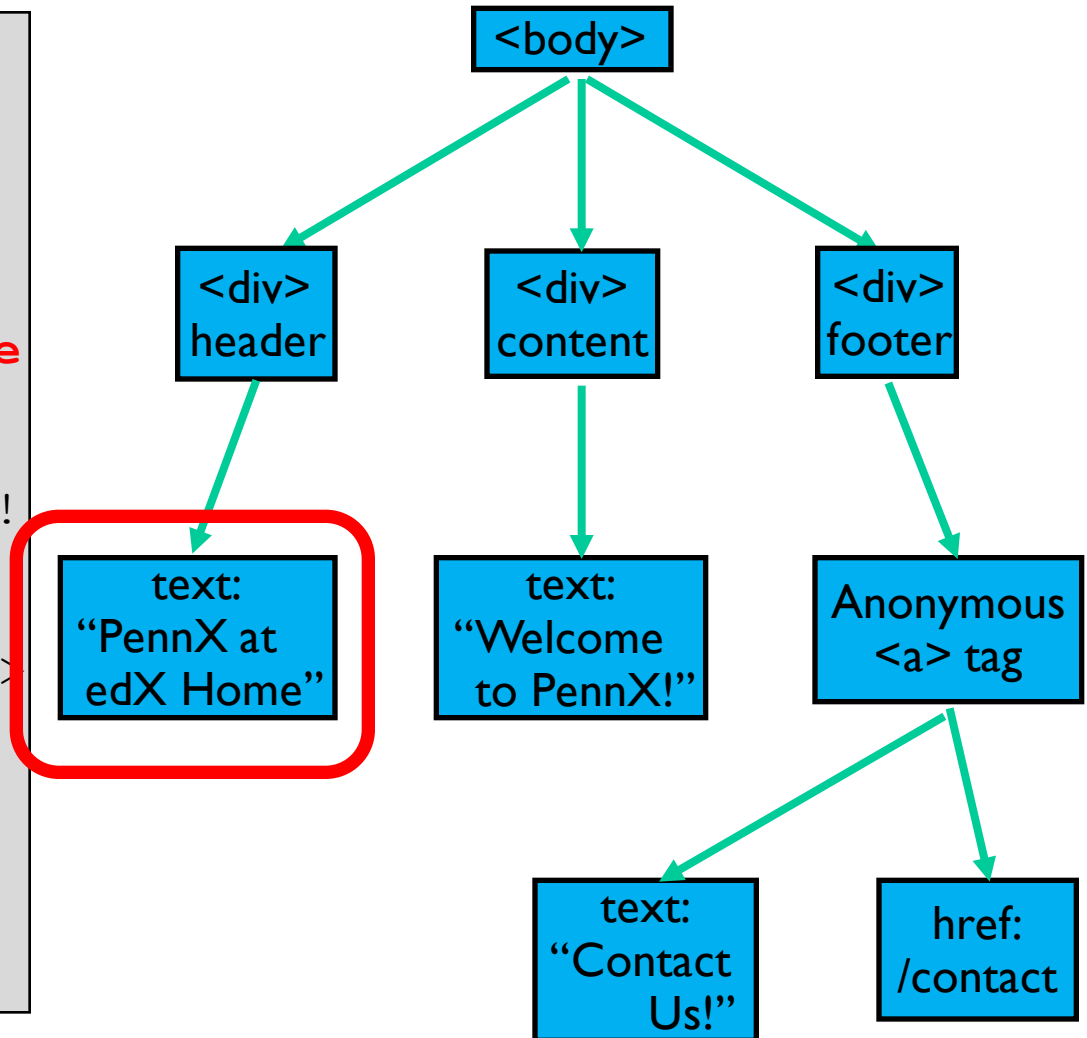


What does the DOM look like?

- HTML

```
<!DOCTYPE html>
<html>
  <body>
    <div id="header">
      PennX at edX Home
    </div>
    <div id="content">
      Welcome to PennX!
    </div>
    <div id="footer">
      <a href="/contact">
        Contact Us!
      </a>
    </div>
  </body>
</html>
```

- DOM tree

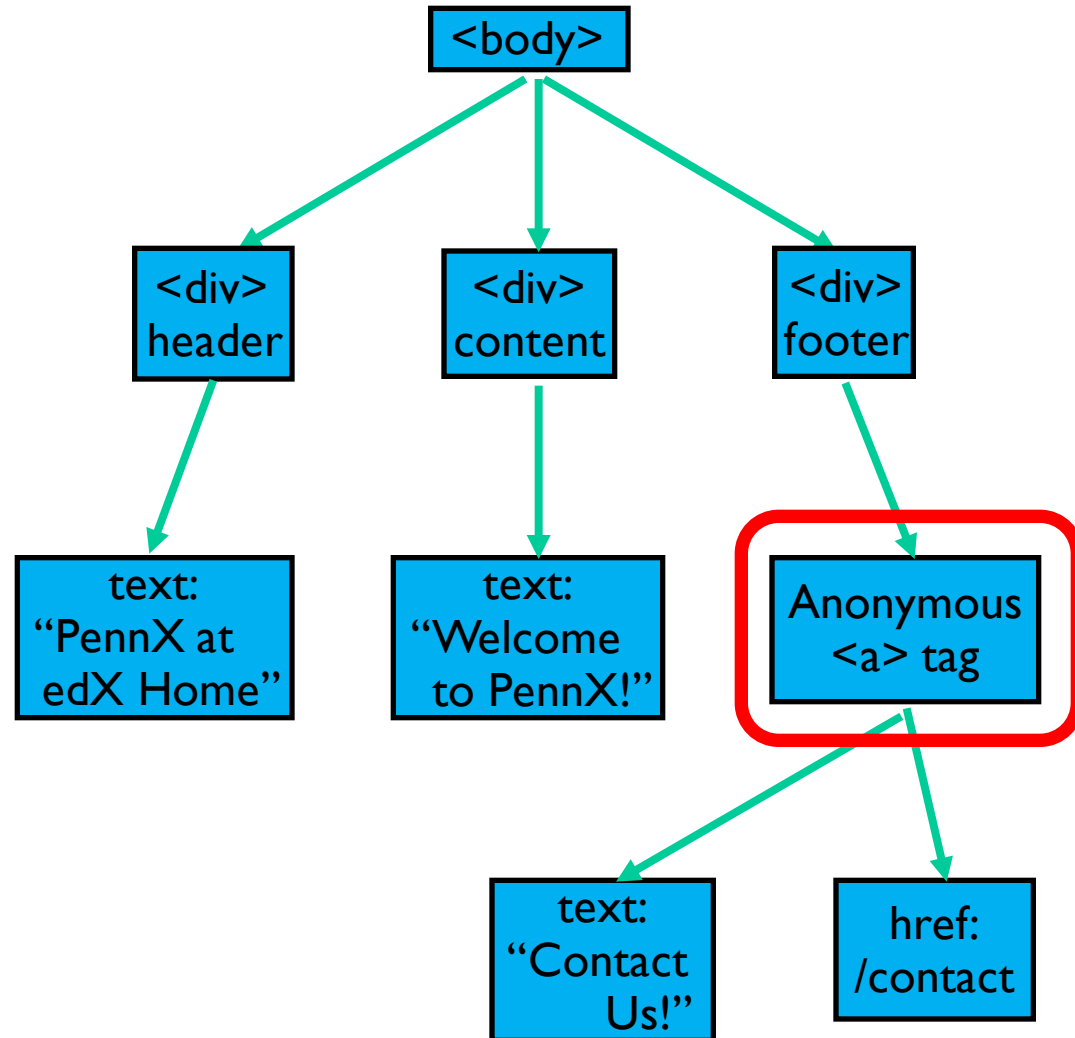


What does the DOM look like?

- HTML

```
<!DOCTYPE html>
<html>
  <body>
    <div id="header">
      PennX at edX Home
    </div>
    <div id="content">
      Welcome to PennX!
    </div>
    <div id="footer">
      <a href="/contact">
        Contact Us!
      </a>
    </div>
  </body>
</html>
```

- DOM tree

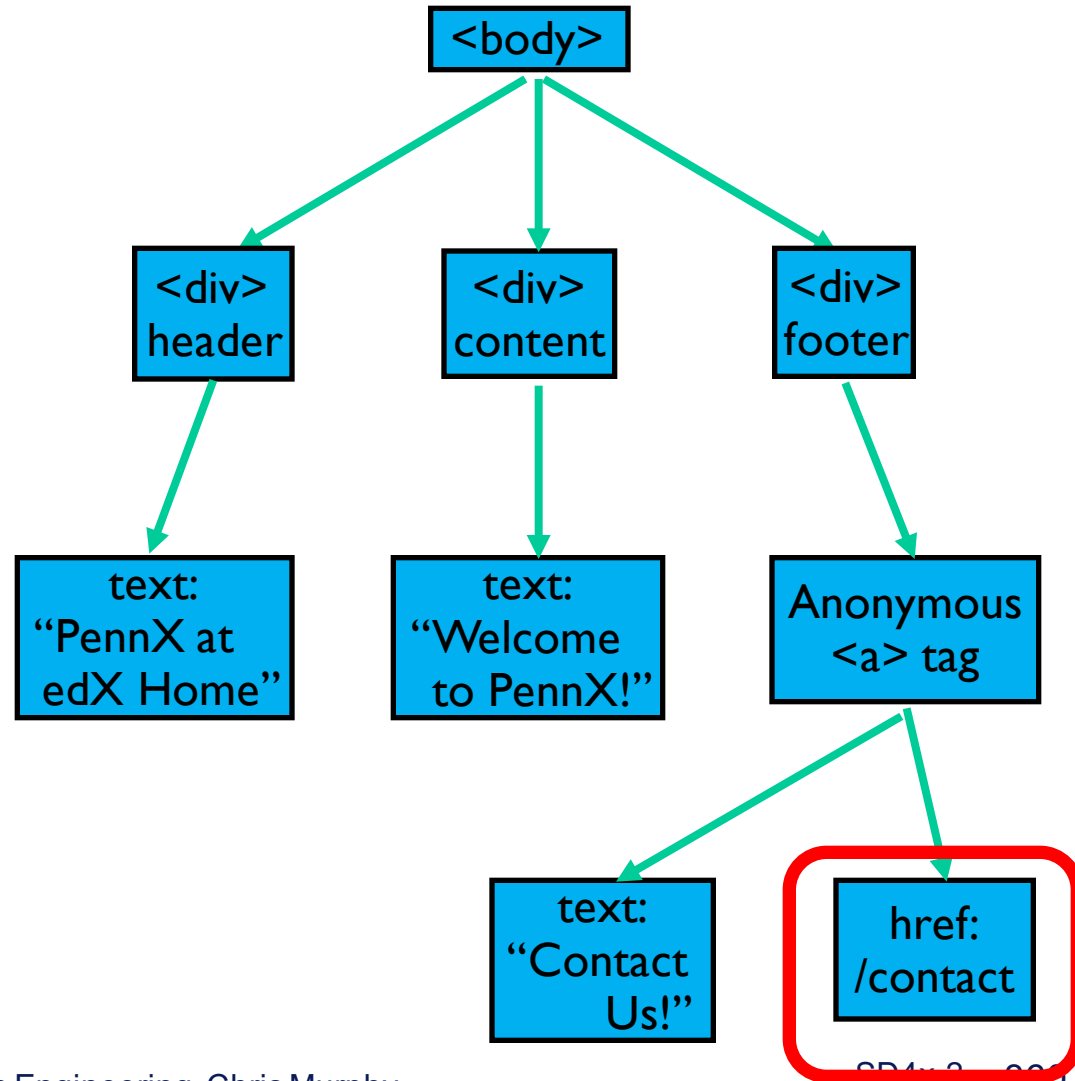


What does the DOM look like?

- HTML

```
<!DOCTYPE html>
<html>
  <body>
    <div id="header">
      PennX at edX Home
    </div>
    <div id="content">
      Welcome to PennX!
    </div>
    <div id="footer">
      <a href="/contact">
        Contact Us!
      </a>
    </div>
  </body>
</html>
```

- DOM tree

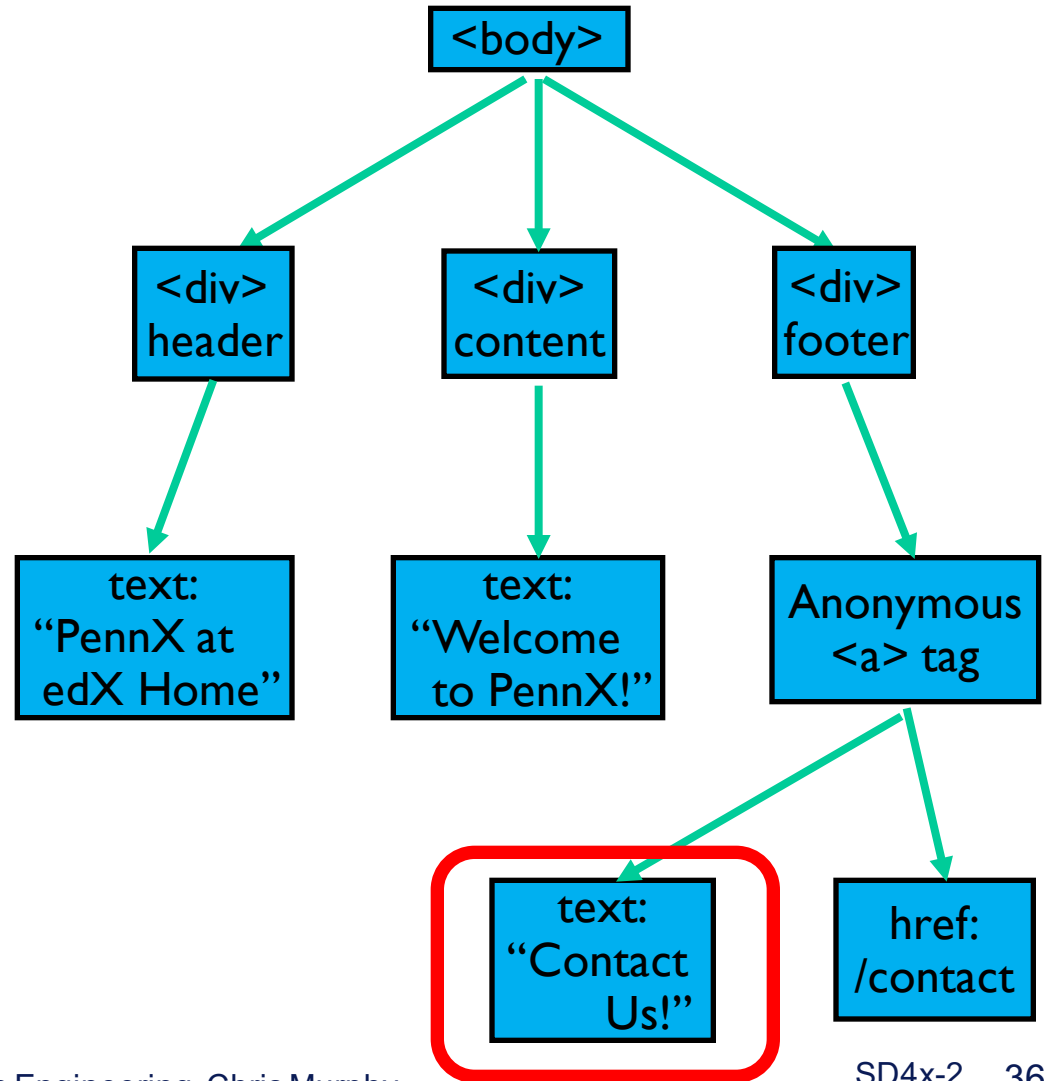


What does the DOM look like?

- HTML

```
<!DOCTYPE html>
<html>
  <body>
    <div id="header">
      PennX at edX Home
    </div>
    <div id="content">
      Welcome to PennX!
    </div>
    <div id="footer">
      <a href="/contact">
        Contact Us!
      </a>
    </div>
  </body>
</html>
```

- DOM tree



What does the DOM look like?

- HTML

```
<!DOCTYPE html>
<html>
  <body>
    <div id="header">
      PennX at edX Home
    </div>
    <div id="content">
      Welcome to PennX!
    </div>
    <div id="footer">
      <a href="/contact">
        Contact Us!
      </a>
    </div>
  </body>
</html>
```

- DOM in console

```
<!DOCTYPE html>
...<html> == $0
  <head></head>
  ▼<body>
    <div id="header">
      PennX at edX Home
    </div>
    <div id="content">
      Welcome to PennX!
    </div>
    ▼<div id="footer">
      <a href="/contact">
        Contact Us!
      </a>
    </div>
  </body>
</html>
```

What does the DOM look like?

- HTML

```
<!DOCTYPE html>
<html>
  <body>
    <div id="header">
      PennX at edX Home
    </div>
    <div id="content">
      Welcome to PennX!
    </div>
    <div id="footer">
      <a href="/contact">
        Contact Us!
      </a>
    </div>
  </body>
</html>
```

- DOM in console

```
<!DOCTYPE html>
...<html> == $0
  <head></head>
  ▼<body>
    <div id="header">
      PennX at edX Home
    </div>
    <div id="content">
      Welcome to PennX!
    </div>
    ▼<div id="footer">
      <a href="/contact">
        Contact Us!
      </a>
    </div>
  </body>
</html>
```

What does the DOM look like?

- HTML

```
<!DOCTYPE html>
<html>
  <body>
    <div id="header">
      PennX at edX Home
    </div>
    <div id="content">
      Welcome to PennX!
    </div>
    <div id="footer">
      <a href="/contact">
        Contact Us!
      </a>
    </div>
  </body>
</html>
```

- DOM in console

```
<!DOCTYPE html>
...<html> == $0
  <head></head>
  ▼ <body>
    <div id="header">
      PennX at edX Home
    </div>
    <div id="content">
      Welcome to PennX!
    </div>
    ▼ <div id="footer">
      <a href="/contact">
        Contact Us!
      </a>
    </div>
  </body>
</html>
```

A diagram illustrating the DOM tree structure. It shows a hierarchical tree of HTML elements. The root is the document object, which contains the root HTML element. The root HTML element has a head child and a body child. The body child has three children: a header div, a content div, and a footer div. The header div contains the text 'PennX at edX Home'. The content div contains the text 'Welcome to PennX!'. The footer div contains an anchor element with the text 'Contact Us!'. Two red arrows point to the body and footer nodes in the tree.

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

DOM Example

- The root DOM object can be accessed by the object called **document**
- Elements in this DOM tree can be retrieved and manipulated

```
<html>
<body>

<div>
  The current date/time is <span id="dateTime"> </span>.
</div>

<script>
  var dateTimeField = document.getElementById('dateTime');
  dateTimeField.innerHTML = new Date();
</script>

</body>
</html>
```

DOM Example

- The root DOM object can be accessed by the object called **document**
- Elements in this DOM tree can be retrieved and manipulated

```
<html>
<body>

<div>
  The current date/time is <span id="dateTime"> </span>.
</div>

<script>
  var dateTimeField = document.getElementById('dateTime');
  dateTimeField.innerHTML = new Date();
</script>

</body>
</html>
```

DOM Example

- The root DOM object can be accessed by the object called **document**
- Elements in this DOM tree can be retrieved and manipulated

```
<html>
<body>

<div>
  The current date/time is </span>.
</div>

<script>
  var dateTimeField = document.getElementById('dateTime');
  dateTimeField.innerHTML = new Date();
</script>

</body>
</html>
```

DOM Example

- The root DOM object can be accessed by the object called **document**
- Elements in this DOM tree can be retrieved and manipulated

```
<html>
<body>

<div>
  The current date/time is <span id="dateTime"> </span>.
</div>

<script>
  var dateTimeField = document.getElementById('dateTime');
  dateTimeField.innerHTML = new Date();
</script>

</body>
</html>
```

DOM Example

- The root DOM object can be accessed by the object called **document**
- Elements in this DOM tree can be retrieved and manipulated

```
<html>
<body>

<div>
  The current date/time is <span id="dateTime"> </span>.
</div>

<script>
  var dateTimeField = document.getElementById('dateTime');
  dateTimeField.innerHTML = new Date();
</script>

</body>
</html>
```

DOM Example

- The root DOM object can be accessed by the object called **document**
- Elements in this DOM tree can be retrieved and manipulated

```
<html>
<body>

<div>
  The current date/time is <span id="dateTime"> </span>.
</div>

<script>
  var dateTimeField = document.getElementById('dateTime');
  dateTimeField.innerHTML = new Date();
</script>

</body>
</html>
```

DOM Example

- The root DOM object can be accessed by the object called **document**
- Elements in this DOM tree can be retrieved and manipulated

```
<html>
<body>

<div>
  The current date/time is <span id="dateTime"> </span>.
</div>

<script>
  var dateTimeField = document.getElementById('dateTime');
  dateTimeField.innerHTML = new Date();
</script>

</body>
</html>
```

DOM Example

- The root DOM object can be accessed by the object called **document**
- Elements in this DOM tree can be retrieved and manipulated

```
<html>
<body>

<div>
  The current date/time is <span id="dateTime"> </span>.
</div>

<script>
  var dateTimeField = document.getElementById( 'dateTime' );
  dateTimeField.innerHTML = new Date();
</script>

</body>
</html>
```


DOM Example

- The root DOM object can be accessed by the object called **document**
- Elements in this DOM tree can be retrieved and manipulated

```
<html>
<body>

<div>
  The current date/time is <span id="dateTime"> </span>.
</div>

<script>
  var dateTimeField = document.getElementById( 'dateTime' );
  dateTimeField.innerHTML = new Date();
</script>

</body>
</html>
```

DOM Example

- The root DOM object can be accessed by the object called **document**
- Elements in this DOM tree can be retrieved and manipulated

```
<html>
<body>

<div>
  The current date/time is <span id="dateTime"> </span>.
</div>

<script>
  var dateTimeField = document.getElementById('dateTime');
  dateTimeField.innerHTML = new Date();
</script>

</body>
</html>
```

DOM Example

- The root DOM object can be accessed by the object called **document**
- Elements in this DOM tree can be retrieved and manipulated

```
<html>
<body>

<div>
  The current date/time is <span id="dateTime"> </span>.
</div>

<script>
  var dateTimeField = document.getElementById('dateTime');
  dateTimeField.innerHTML = new Date();
</script>

</body>
</html>
```

DOM Example

- Data can be stored in the browser across multiple page requests using `localStorage`

DOM Example

- Data can be stored in the browser across multiple page requests using **localStorage**

```
<div>
  You have visited this page <span id="report"> </span> times.
</div>

<script>
  var timesVisited = 0;
  if (localStorage.timesVisited) {
    timesVisited = parseInt(localStorage.timesVisited);
  }
  timesVisited += 1;
  localStorage.setItem('timesVisited', timesVisited);

  var report = document.getElementById('report');
  report.innerHTML = timesVisited;

  if (timesVisited > 10)
    report.style.backgroundColor = 'red';
</script>
```

DOM Example

- Data can be stored in the browser across multiple page requests using **localStorage**

```
<div>
  You have visited this page <span id="report"> </span> times.
</div>

<script>
  var timesVisited = 0;
  if (localStorage.timesVisited) {
    timesVisited = parseInt(localStorage.timesVisited);
  }
  timesVisited += 1;
  localStorage.setItem('timesVisited', timesVisited);

  var report = document.getElementById('report');
  report.innerHTML = timesVisited;

  if (timesVisited > 10)
    report.style.backgroundColor = 'red';
</script>
```

DOM Example

- Data can be stored in the browser across multiple page requests using **localStorage**

```
<div>
  You have visited this page <span id="report"> </span> times.
</div>

<script>
  var timesVisited = 0;
  if (localStorage.timesVisited) {
    timesVisited = parseInt(localStorage.timesVisited);
  }
  timesVisited += 1;
  localStorage.setItem('timesVisited', timesVisited);

  var report = document.getElementById('report');
  report.innerHTML = timesVisited;

  if (timesVisited > 10)
    report.style.backgroundColor = 'red';
</script>
```

DOM Example

- Data can be stored in the browser across multiple page requests using **localStorage**

```
<div>
  You have visited this page <span id="report"> </span> times.
</div>

<script>
  var timesVisited = 0;
  if (localStorage.timesVisited) {
    timesVisited = parseInt(localStorage.timesVisited);
  }
  timesVisited += 1;
  localStorage.setItem('timesVisited', timesVisited);

  var report = document.getElementById('report');
  report.innerHTML = timesVisited;

  if (timesVisited > 10)
    report.style.backgroundColor = 'red';
</script>
```


DOM Example

- Data can be stored in the browser across multiple page requests using **localStorage**

```
<div>
  You have visited this page <span id="report"> </span> times.
</div>

<script>
  var timesVisited = 0;
  if (localStorage.timesVisited) {
    timesVisited = parseInt(localStorage.timesVisited) ;
  }
  timesVisited += 1;
  localStorage.setItem('timesVisited', timesVisited);

  var report = document.getElementById('report');
  report.innerHTML = timesVisited;

  if (timesVisited > 10)
    report.style.backgroundColor = 'red';
</script>
```

DOM Example

- Data can be stored in the browser across multiple page requests using **localStorage**

```
<div>
  You have visited this page <span id="report"> </span> times.
</div>

<script>
  var timesVisited = 0;
  if (localStorage.timesVisited) {
    timesVisited = parseInt(localStorage.timesVisited);
  }
  timesVisited += 1;
  localStorage.setItem('timesVisited', timesVisited);

  var report = document.getElementById('report');
  report.innerHTML = timesVisited;

  if (timesVisited > 10)
    report.style.backgroundColor = 'red';
</script>
```

DOM Example

- Data can be stored in the browser across multiple page requests using **localStorage**

```
<div>
  You have visited this page <span id="report"> </span> times.
</div>

<script>
  var timesVisited = 0;
  if (localStorage.timesVisited) {
    timesVisited = parseInt(localStorage.timesVisited);
  }
  timesVisited += 1;
  localStorage.setItem('timesVisited', timesVisited);

  var report = document.getElementById('report');
  report.innerHTML = timesVisited;

  if (timesVisited > 10)
    report.style.backgroundColor = 'red';
</script>
```

DOM Example

- Data can be stored in the browser across multiple page requests using **localStorage**

```
<div>
  You have visited this page <span id="report"> </span> times.
</div>

<script>
  var timesVisited = 0;
  if (localStorage.timesVisited) {
    timesVisited = parseInt(localStorage.timesVisited);
  }
  timesVisited += 1;
  localStorage.setItem('timesVisited', timesVisited);

  var report = document.getElementById('report');
  report.innerHTML = timesVisited;

  if (timesVisited > 10)
    report.style.backgroundColor = 'red';
</script>
```

DOM Example

- Data can be stored in the browser across multiple page requests using **localStorage**

```
<div>
  You have visited this page <span id="report"> </span> times.
</div>

<script>
  var timesVisited = 0;
  if (localStorage.timesVisited) {
    timesVisited = parseInt(localStorage.timesVisited);
  }
  timesVisited += 1;
  localStorage.setItem('timesVisited', timesVisited);

  var report = document.getElementById('report');
  report.innerHTML = timesVisited;

  if (timesVisited > 10)
    report.style.backgroundColor = 'red';
</script>
```

DOM Example

- Data can be stored in the browser across multiple page requests using **localStorage**

```
<div>
  You have visited this page <span id="report"> </span> times.
</div>

<script>
  var timesVisited = 0;
  if (localStorage.timesVisited) {
    timesVisited = parseInt(localStorage.timesVisited);
  }
  timesVisited += 1;
  localStorage.setItem('timesVisited', timesVisited);

  var report = document.getElementById('report');
  report.innerHTML = timesVisited;

  if (timesVisited > 10)
    report.style.backgroundColor = 'red';
</script>
```

Objects as JSON

- JSON = JavaScript **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": "EdX", "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:

```
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.

DOM and JSON

You have accessed this page times.

<p>

Your last visit was .

<script>

var timesVisited = 0;

var lastVisitDate = 'never';

if (localStorage.lastVisit) {

var lastVisit = JSON.parse(localStorage.lastVisit);

timesVisited = lastVisit.numVisits;

lastVisitDate = lastVisit.date;

}

document.getElementById('lastVisitDate').innerHTML = lastVisitDate;

timesVisited++;

document.getElementById('report').innerHTML = timesVisited;

var myLastVisit = { }

myLastVisit.date = new Date();

myLastVisit.numVisits = timesVisited;

localStorage.lastVisit = JSON.stringify(myLastVisit);

</script>

DOM and JSON

You have accessed this page times.

<p>

Your last visit was .

<script>

var timesVisited = 0;

var lastVisitDate = 'never';

if (localStorage.lastVisit) {

var lastVisit = JSON.parse(localStorage.lastVisit);

timesVisited = lastVisit.numVisits;

lastVisitDate = lastVisit.date;

}

document.getElementById('lastVisitDate').innerHTML = lastVisitDate;

timesVisited++;

document.getElementById('report').innerHTML = timesVisited;

var myLastVisit = { }

myLastVisit.date = new Date();

myLastVisit.numVisits = timesVisited;

localStorage.lastVisit = JSON.stringify(myLastVisit);

</script>

DOM and JSON

You have accessed this page `` times.

`<p>`

Your last visit was ``.

```
<script>
```

```
var timesVisited = 0;
```

```
var lastVisitDate = 'never';
```

```
if (localStorage.lastVisit) {
```

```
    var lastVisit = JSON.parse(localStorage.lastVisit);
```

```
    timesVisited = lastVisit.numVisits;
```

```
    lastVisitDate = lastVisit.date;
```

```
}
```

```
document.getElementById('lastVisitDate').innerHTML = lastVisitDate;
```

```
timesVisited++;
```

```
document.getElementById('report').innerHTML = timesVisited;
```

```
var myLastVisit = { }
```

```
myLastVisit.date = new Date();
```

```
myLastVisit.numVisits = timesVisited;
```

```
localStorage.lastVisit = JSON.stringify(myLastVisit);
```

```
</script>
```

DOM and JSON

You have accessed this page times.

<p>

Your last visit was .

<script>

var timesVisited = 0;

var lastVisitDate = 'never';

if (localStorage.lastVisit) {

var lastVisit = JSON.parse(localStorage.lastVisit);

timesVisited = lastVisit.numVisits;

lastVisitDate = lastVisit.date;

}

document.getElementById('lastVisitDate').innerHTML = lastVisitDate;

timesVisited++;

document.getElementById('report').innerHTML = timesVisited;

var myLastVisit = { }

myLastVisit.date = new Date();

myLastVisit.numVisits = timesVisited;

localStorage.lastVisit = JSON.stringify(myLastVisit);

</script>

DOM and JSON

You have accessed this page times.

<p>

Your last visit was .

<script>

var timesVisited = 0;

var lastVisitDate = 'never';

if (localStorage.lastVisit) {

var lastVisit = JSON.parse(localStorage.lastVisit);

timesVisited = lastVisit.numVisits;

lastVisitDate = lastVisit.date;

}

document.getElementById('lastVisitDate').innerHTML = lastVisitDate;

timesVisited++;

document.getElementById('report').innerHTML = timesVisited;

var myLastVisit = { }

myLastVisit.date = new Date();

myLastVisit.numVisits = timesVisited;

localStorage.lastVisit = JSON.stringify(myLastVisit);

</script>

DOM and JSON

You have accessed this page times.

<p>

Your last visit was .

<script>

var timesVisited = 0;

var lastVisitDate = 'never';

if (localStorage.lastVisit) {

var lastVisit = JSON.parse(localStorage.lastVisit);

timesVisited = lastVisit.numVisits;

lastVisitDate = lastVisit.date;

}

document.getElementById('lastVisitDate').innerHTML = lastVisitDate;

timesVisited++;

document.getElementById('report').innerHTML = timesVisited;

var myLastVisit = { }

myLastVisit.date = new Date();

myLastVisit.numVisits = timesVisited;

localStorage.lastVisit = JSON.stringify(myLastVisit);

</script>

DOM and JSON

You have accessed this page `` times.

`<p>`

Your last visit was ``.

```
<script>
```

```
var timesVisited = 0;
```

```
var lastVisitDate = 'never';
```

```
if (localStorage.lastVisit) {
```

```
    var lastVisit = JSON.parse(localStorage.lastVisit);
```

```
    timesVisited = lastVisit.numVisits;
```

```
    lastVisitDate = lastVisit.date;
```

```
}
```

```
document.getElementById('lastVisitDate').innerHTML = lastVisitDate;
```

```
timesVisited++;
```

```
document.getElementById('report').innerHTML = timesVisited;
```

```
var myLastVisit = { }
```

```
myLastVisit.date = new Date();
```

```
myLastVisit.numVisits = timesVisited;
```

```
localStorage.lastVisit = JSON.stringify(myLastVisit);
```

```
</script>
```


DOM and JSON

You have accessed this page times.

<p>

Your last visit was .

<script>

var timesVisited = 0;

var lastVisitDate = 'never';

if (localStorage.lastVisit) {

var lastVisit = JSON.parse(localStorage.lastVisit);

timesVisited = lastVisit.numVisits;

lastVisitDate = lastVisit.date;

}

document.getElementById('lastVisitDate').innerHTML = lastVisitDate;

timesVisited++;

document.getElementById('report').innerHTML = timesVisited;

var myLastVisit = { }

myLastVisit.date = new Date();

myLastVisit.numVisits = timesVisited;

localStorage.lastVisit = JSON.stringify(myLastVisit);

</script>

DOM and JSON

You have accessed this page times.

<p>

Your last visit was .

<script>

var timesVisited = 0;

var lastVisitDate = 'never';

if (localStorage.lastVisit) {

var lastVisit = JSON.parse(localStorage.lastVisit);

timesVisited = lastVisit.numVisits;

lastVisitDate = lastVisit.date;

}

document.getElementById('lastVisitDate').innerHTML = lastVisitDate;

timesVisited++;

document.getElementById('report').innerHTML = timesVisited;

var myLastVisit = { }

myLastVisit.date = new Date();

myLastVisit.numVisits = timesVisited;

localStorage.lastVisit = JSON.stringify(myLastVisit);

</script>

DOM and JSON

You have accessed this page times.

<p>

Your last visit was .

<script>

var timesVisited = 0;

var lastVisitDate = 'never';

if (localStorage.lastVisit) {

var lastVisit = JSON.parse(localStorage.lastVisit);

timesVisited = lastVisit.numVisits;

lastVisitDate = lastVisit.date;

}

document.getElementById('lastVisitDate').innerHTML = lastVisitDate;

timesVisited++;

document.getElementById('report').innerHTML = timesVisited;

var myLastVisit = { }

myLastVisit.date = new Date();

myLastVisit.numVisits = timesVisited;

localStorage.lastVisit = JSON.stringify(myLastVisit);

</script>

DOM and JSON

You have accessed this page times.

<p>

Your last visit was .

<script>

var timesVisited = 0;

var lastVisitDate = 'never';

if (localStorage.lastVisit) {

var lastVisit = JSON.parse(localStorage.lastVisit);

timesVisited = lastVisit.numVisits;

lastVisitDate = lastVisit.date;

}

document.getElementById('lastVisitDate').innerHTML = lastVisitDate;

timesVisited++;

document.getElementById('report').innerHTML = timesVisited;

var myLastVisit = { }

myLastVisit.date = new Date();

myLastVisit.numVisits = timesVisited;

localStorage.lastVisit = JSON.stringify(myLastVisit);

</script>

DOM and JSON

You have accessed this page times.

<p>

Your last visit was .

<script>

var timesVisited = 0;

var lastVisitDate = 'never';

if (localStorage.lastVisit) {

var lastVisit = JSON.parse(localStorage.lastVisit);

timesVisited = lastVisit.numVisits;

lastVisitDate = lastVisit.date;

}

document.getElementById('lastVisitDate').innerHTML = lastVisitDate;

timesVisited++;

document.getElementById('report').innerHTML = timesVisited;

var myLastVisit = { }

myLastVisit.date = new Date();

myLastVisit.numVisits = timesVisited;

localStorage.lastVisit = JSON.stringify(myLastVisit);

</script>

DOM and JSON

You have accessed this page times.

<p>

Your last visit was .

<script>

var timesVisited = 0;

var lastVisitDate = 'never';

if (localStorage.lastVisit) {

var lastVisit = JSON.parse(localStorage.lastVisit);

timesVisited = lastVisit.numVisits;

lastVisitDate = lastVisit.date;

}

document.getElementById('lastVisitDate').innerHTML = lastVisitDate;

timesVisited++;

document.getElementById('report').innerHTML = timesVisited;

var myLastVisit = { }

myLastVisit.date = new Date();

myLastVisit.numVisits = timesVisited;

localStorage.lastVisit = JSON.stringify(myLastVisit);

</script>

DOM and JSON

You have accessed this page times.

<p>

Your last visit was .

<script>

var timesVisited = 0;

var lastVisitDate = 'never';

if (localStorage.lastVisit) {

var lastVisit = JSON.parse(localStorage.lastVisit);

timesVisited = lastVisit.numVisits;

lastVisitDate = lastVisit.date;

}

document.getElementById('lastVisitDate').innerHTML = lastVisitDate;

timesVisited++;

document.getElementById('report').innerHTML = timesVisited;

var myLastVisit = { }

myLastVisit.date = new Date();

myLastVisit.numVisits = timesVisited;

localStorage.lastVisit = JSON.stringify(myLastVisit);

</script>

DOM and JSON

You have accessed this page times.

<p>

Your last visit was .

<script>

var timesVisited = 0;

var lastVisitDate = 'never';

if (localStorage.lastVisit) {

var lastVisit = JSON.parse(localStorage.lastVisit);

timesVisited = lastVisit.numVisits;

lastVisitDate = lastVisit.date;

}

document.getElementById('lastVisitDate').innerHTML = lastVisitDate;

timesVisited++;

document.getElementById('report').innerHTML = timesVisited;

var myLastVisit = { }

myLastVisit.date = new Date();

myLastVisit.numVisits = timesVisited;

localStorage.lastVisit = JSON.stringify(myLastVisit);

</script>

DOM and JSON

You have accessed this page times.

<p>

Your last visit was .

<script>

var timesVisited = 0;

var lastVisitDate = 'never';

if (localStorage.lastVisit) {

var lastVisit = JSON.parse(localStorage.lastVisit);

timesVisited = lastVisit.numVisits;

lastVisitDate = lastVisit.date;

}

document.getElementById('lastVisitDate').innerHTML = lastVisitDate;

timesVisited++;

document.getElementById('report').innerHTML = timesVisited;

var myLastVisit = { }

myLastVisit.date = new Date();

myLastVisit.numVisits = timesVisited;

localStorage.lastVisit = JSON.stringify(myLastVisit);

</script>

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