GENERAL ASSEMBLY

JAVASCRIPT DEVELOPMENT

Sasha Vodnik, Instructor

HELLO!

1. Pull changes from the `vodnik/JS-SF-16-resources` repo to your computer
2. Open the `06-json-dom` folder in your editor

JAVASCRIPT DEVELOPMENT

OBJECTS & JSON

LEARNING OBJECTIVES

At the end of this class, you will be able to

- Describe what hoisting does
- Identify likely objects, properties, and methods in real-world scenarios
- Create JavaScript objects using object literal notation
- Implement and interface with JSON data

AGENDA

- Hoisting
- Objects
- JSON

WEEKLY OVERVIEW

WEEK 4	Objects & JSON / Intro to DOM & jQuery
WEEK 5	Advanced jQuery / Ajax & APIs
WEEK 6	Asynchronous JS & callbacks / Advanced APIs

SLACK BOT LAB

HOMEWORK REVIEW

HOMEWORK — GROUP DISCUSSION

EXERCISE

TYPE OF EXERCISE

- Groups of 2-3

TIMING

6 min

1. Show off your bot! What can it do?
2. Share a challenge you encountered, and how you overcame it.
3. If you tried something that didn't work, or wanted to add functionality but weren't quite sure how, brainstorm with your group how you might approach it.

HOMEWORK — GROUP DISCUSSION

EXERCISE

TYPE OF EXERCISE

- Groups of 2-3

TIMING

4 min

1. Share your solutions to the homework.
2. Share a challenge you encountered, and how you overcame it.

HOISTING

HOISTING

Variable names declared with `var` are hoisted, but not their values.

Code as written by developer

```
function foo() {
  console.log("Hello!");
  var x = 1;
}
```

Code as interpreted by parser

```
function foo() {
  var x;
  console.log("Hello!");
  x = 1;
}
```

HOISTING

Variables declared with `let` or `const` are **not** hoisted.

Code as written by developer

```
function foo() {
  console.log(“Hello!”);
  let x = 1;
}
```

Code as interpreted by parser

```
function foo() {
  console.log(“Hello!”);
  let x = 1;
}
```

HOISTING

Function declarations are hoisted.
Your code can call a hoisted function before it has been declared

Code as written by developer

```
foo();

function foo() {
  console.log(“Hello!”);
}
```

Code as interpreted by parser

```
function foo() {
  console.log(“Hello!”);
}

foo();
```

HOISTING

Function expressions are treated like other variables

Code as written by developer

```
foo();

var foo = function() {
  console.log(“Hello!”);
}
```

Code as interpreted by parser

```
var foo;

foo(); // error: foo is
       // not a function

foo = function() {
  console.log(“Hello!”);
}
```

HOISTING

Function expressions are treated like other variables

Code as written by developer

```
foo();

let foo = function() {
  console.log(“Hello!”);
}
```

Code as interpreted by parser

```
foo(); // error: foo is
       // not defined

let foo = function() {
  console.log(“Hello!”);
}
```

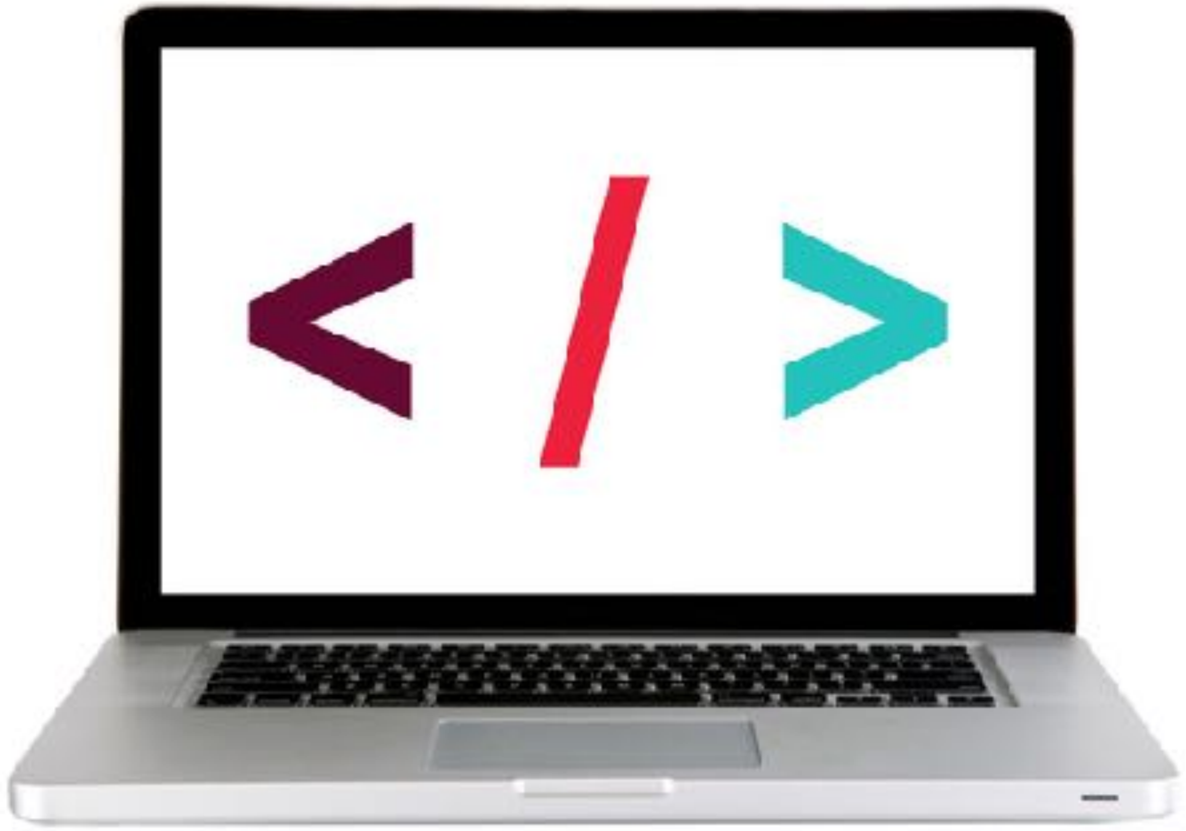
VARIABLES AND HOISTING

keyword	what is hoisted?
`let/const`	nothing 🎉
`var`	name only 🤨

FUNCTIONS AND HOISTING

type	what is hoisted?
expression using `let/const`	nothing 🎉
expression using var	name only 🤨
declaration	name and content 😳

LET'S TAKE A CLOSER LOOK



EXERCISE — HOISTING

EXERCISE

KEY OBJECTIVE

- Describe what hoisting does

TYPE OF EXERCISE

- Groups of 3

EXECUTION

2 min

1. Examine the code on the screen.
2. Discuss with your group which parts of the code are hoisted.
3. Predict the result of each of the first four statements.

OBJECTS

EXERCISE — OBJECTS

EXERCISE

KEY OBJECTIVE

- Create JavaScript objects using object literal notation

TYPE OF EXERCISE

- Groups of 2-3

TIMING

3 min

1. For the thing you’ve been assigned, make a list of attributes (descriptions) and actions (things it can do).

OBJECTS ARE A SEPARATE DATA TYPE

STRING

NUMBER

ARRAY

BOOLEAN

OBJECT

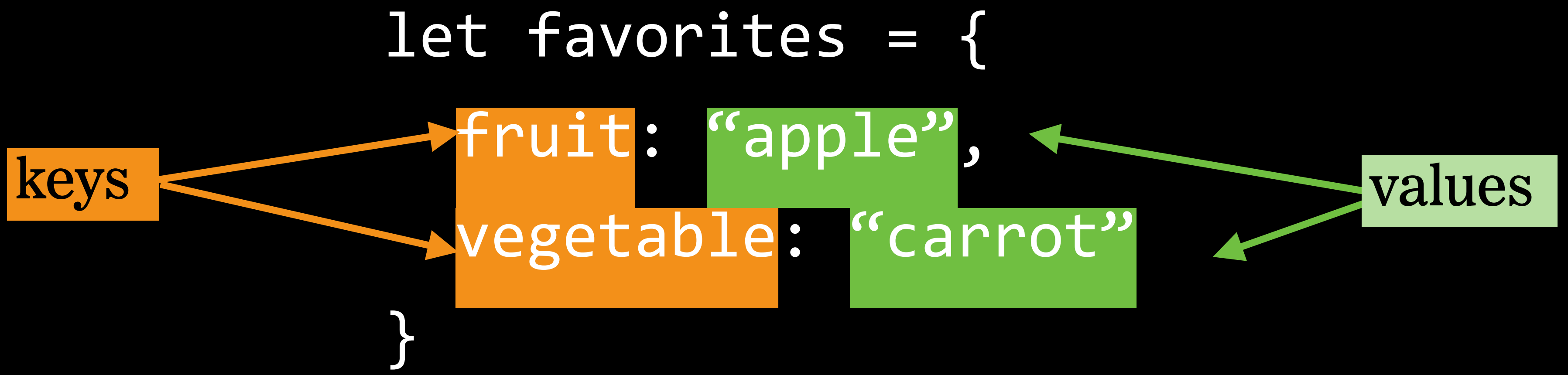
AN OBJECT IS A COLLECTION OF PROPERTIES

```
let favorites = {
  fruit: “apple”,
  vegetable: “carrot”,
}
```

properties

PROPERTY = KEY & VALUE

- A **property** is an association between a key and a value
  - **key**: name (often descriptive) used to reference the data
  - **value**: the data stored in that property



```
let favorites = {
  fruit: “apple”,
  vegetable: “carrot”
}
```

KEY-VALUE PAIR

- A property is sometimes referred to as a **key-value pair**

```
let favorites = {
  fruit: “apple”,
  vegetable: “carrot”
}
```

key-value pair

AN OBJECT IS NOT ORDERED

```
  [
0   “apple”,
1   “pear”,
2   “banana”
  ]
```

ARRAY
ordered

```
{
  fruit: “apple”,
  vegetable: “carrot”,
  fungus: “trumpet mushroom”
}
```

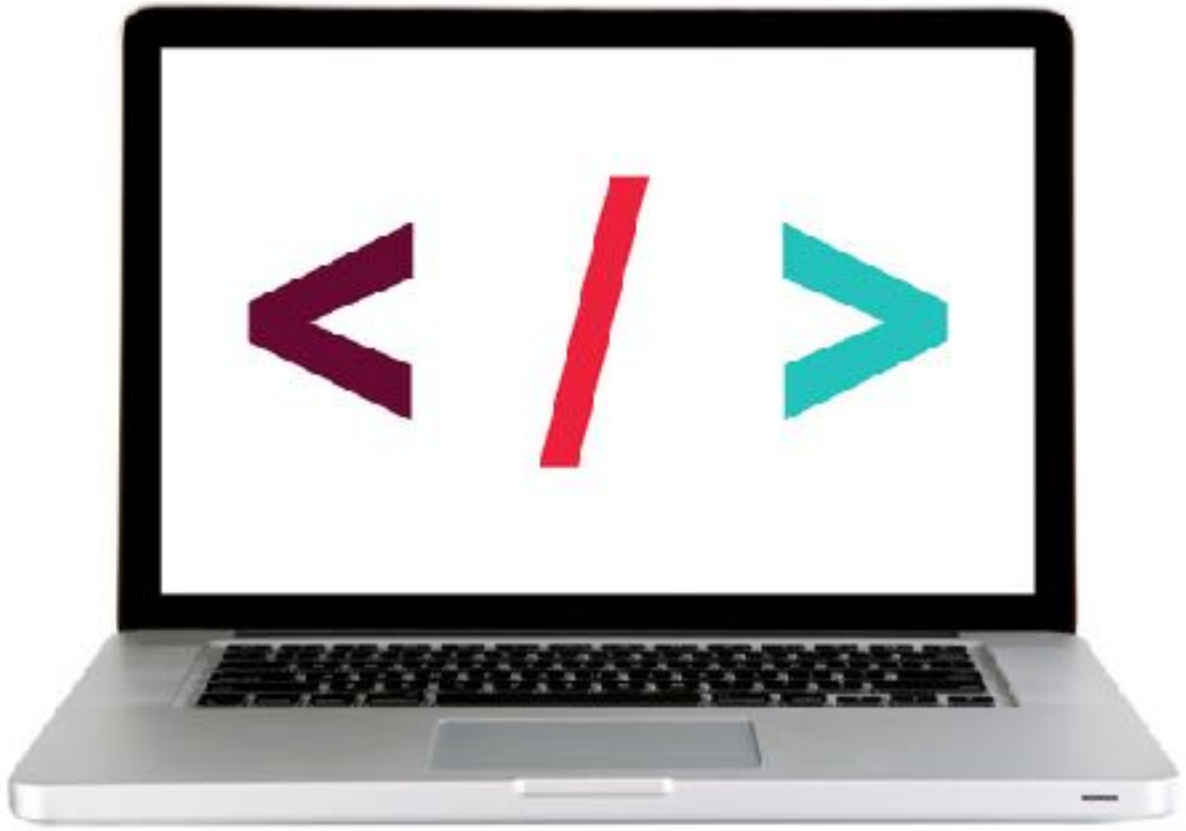
OBJECT
not ordered

A METHOD IS A PROPERTY WHOSE VALUE IS A FUNCTION

method

```
let favorites = {
  fruit: “apple”,
  vegetable: “carrot”,
  declare: function() {
    console.log(“I like fruits and vegetables!”);
  },
}
```

LET'S TAKE A CLOSER LOOK



TWO WAYS TO GET/SET PROPERTIES

dot notation

square bracket notation

GETTING A PROPERTY VALUE WITH DOT NOTATION

object

```
let favorites = {
  fruit: “apple”,
  veg: “carrot”,
  declare: function() {
    console.log(“I like fruit and veg”);
  }
}
```

object name

getting properties

property name

```
favorites.fruit
> “apple”
favorites.veg
> “carrot”
```

object name

calling a method

method name

```
favorites.declare()
> “I like fruit and veg”
```

SETTING A PROPERTY VALUE WITH DOT NOTATION

object

```
let favorites = {
  fruit: “apple”,
  veg: “carrot”,
  declare: function() {
    console.log(“I like fruit and veg”);
  }
}
```

setting properties

```
favorites.fungus = ‘shiitake’;
favorites.pet = ‘hamster’;
```

setting a method

```
favorites.beAmbivalent = function() {
  console.log(“I like other things”);
};
```

GETTING A PROPERTY VALUE WITH SQUARE BRACKET NOTATION

object

```
let favorites = {
  fruit: “apple”,
  veg: “carrot”,
  declare: function() {
    console.log(“I like fruit and veg”);
  }
}
```

object name

getting properties

```
favorites["fruit"]
> “apple”
favorites["veg"]
> “carrot”
```

property name

SETTING A PROPERTY VALUE WITH SQUARE BRACKET NOTATION

object

```
let favorites = {
  fruit: “apple”,
  veg: “carrot”,
  declare: function() {
    console.log(“I like fruit and veg”);
  }
}
```

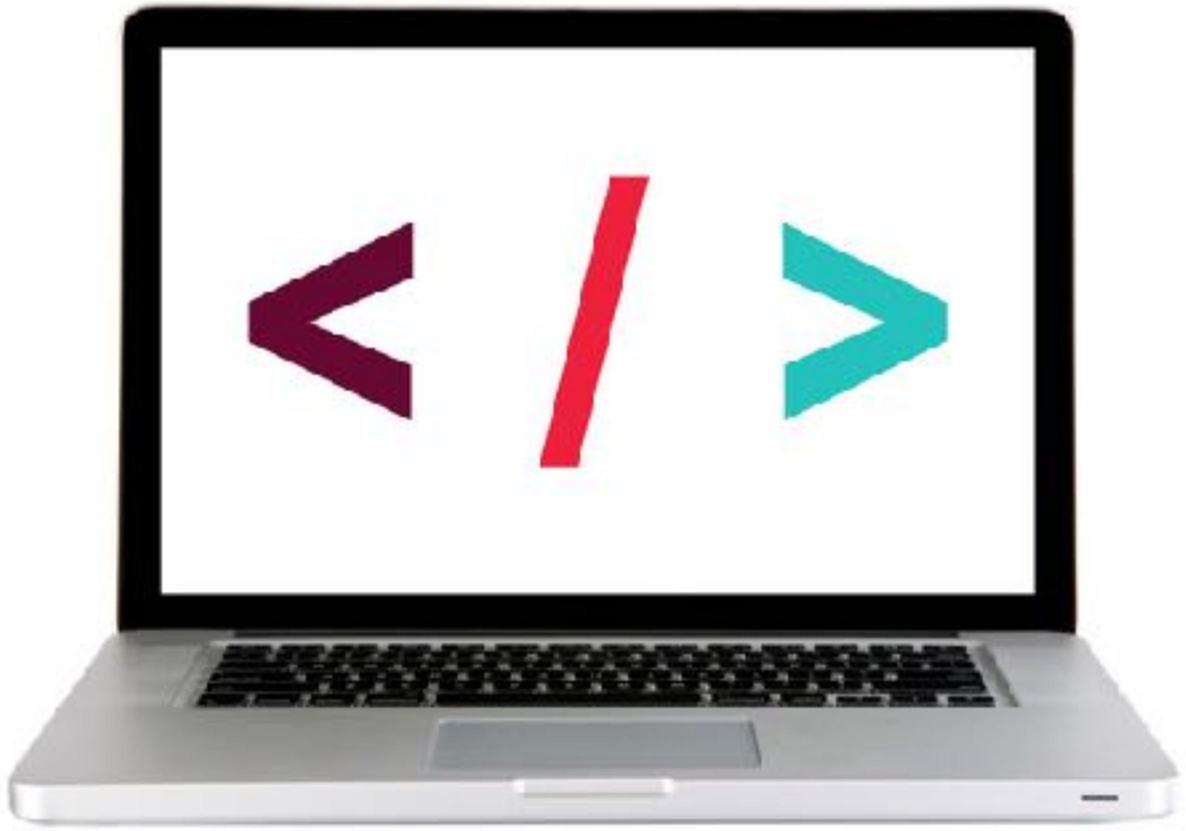
setting properties

```
favorites["fungus"] = ‘shiitake’;
favorites["pet"] = ‘hamster’;
```

setting a method

```
favorites["beAmbivalent"] = function() {
  console.log(“I like other things”);
};
```

LET'S TAKE A CLOSER LOOK



EXERCISE — OBJECTS

EXERCISE

KEY OBJECTIVE

- Create JavaScript objects using object literal notation

TYPE OF EXERCISE

- Groups of 2-3 (same group as for previous exercise)

TIMING

3 min

1. On your desk or on the wall, write code to create a variable whose name corresponds to the thing you were assigned in the previous exercise (cloud, houseplant, nation, office chair, or airplane).
2. Write code to add a property to the object and specify a value for the property.
3. Write code to add a method to the object, and specify a value for the method (use a comment or console.log() statement for the function body).
4. BONUS: Rewrite your answers for 1-3 as a single JavaScript statement.

REAL WORLD SCENARIOS

REAL WORLD SCENARIO

A user, browsing on a shopping website, searches for size 12 running shoes, and examines several pairs before purchasing one.

OBJECTS = NOUNS

A user, browsing on a shopping website, searches for size 12 running shoes, and examines several pairs before purchasing one.

implicit object:

shopping cart

PROPERTIES = ADJECTIVES

A user, browsing on a shopping website, searches for size 12 running shoes, and examines several pairs before purchasing one.

implicit properties:

for each pair of shoes:

price
color

for the shopping cart:

contents
total
shipping
tax

METHODS = VERBS

A user, browsing on a shopping website, searches for size 12 running shoes, and examines several pairs before purchasing one.

implicit methods:

for each pair of shoes:

add to cart

for the shopping cart:

calculate shipping
calculate tax
complete purchase
remove item

EXERCISE — REAL WORLD SCENARIOS & OBJECTS

EXERCISE

KEY OBJECTIVE

- Identify likely objects, properties, and methods in real-world scenarios

TYPE OF EXERCISE

- Groups of 3-4

TIMING

10 min

1. Read through your scenario together.
2. Identify and write down likely objects, properties, and methods in your scenario. (Remember to consider implicit objects as well as explicit ones.)
3. Choose someone to report your results to the class.

LAB — OBJECTS

LAB

KEY OBJECTIVE

- Create JavaScript objects using object literal notation

TYPE OF EXERCISE

- Individual or pair

TIMING

15 min

1. Open `starter-code > 2-object-exercise > monkey.js` in your editor.
2. Create objects for 3 different monkeys each with the properties and methods listed in the start file.
3. Practice retrieving properties and using methods with both dot notation and bracket syntax.
4. BONUS: Rewrite your code to use a constructor function.

JSON

JSON IS A DATA FORMAT BASED ON JAVASCRIPT

object

```
let instructor = {
  firstName: ‘Sasha’,
  lastName: ‘Vodnik’,
  city: ‘San Francisco’,
  classes: [
    ‘JSD’, ‘FWD’
  ],
  classroom: 3,
  launched: true,
  dates: {
    start: 20190611,
    end: 20190814,
  },
};
```

JSON

```
{
  “firstName”: “Sasha”,
  “lastName”: “Vodnik”,
  “city”: “San Francisco”,
  “classes”: [
    “JSD”, “FWD”
  ],
  “classroom": 3,
  “launched”: true,
  “dates”: {
    “start”: 20190611,
    “end”: 20190814
  }
}
```

JSON

- Easy for humans to read and write
- Easy for programs to parse and generate

```
{
  “firstName”: “Sasha”,
  “lastName”: “Vodnik”,
  “city”: “San Francisco”,
  “classes”: [
    “JSD”, “FWD”
  ],
  “classroom": 3,
  “launched”: true,
  “dates”: {
    “start”: 20190611,
    “end”: 20190814
  }
}
```

JSON IS NOT JAVASCRIPT-SPECIFIC

- Used across the web by programs written in many languages

React

jQuery

JS

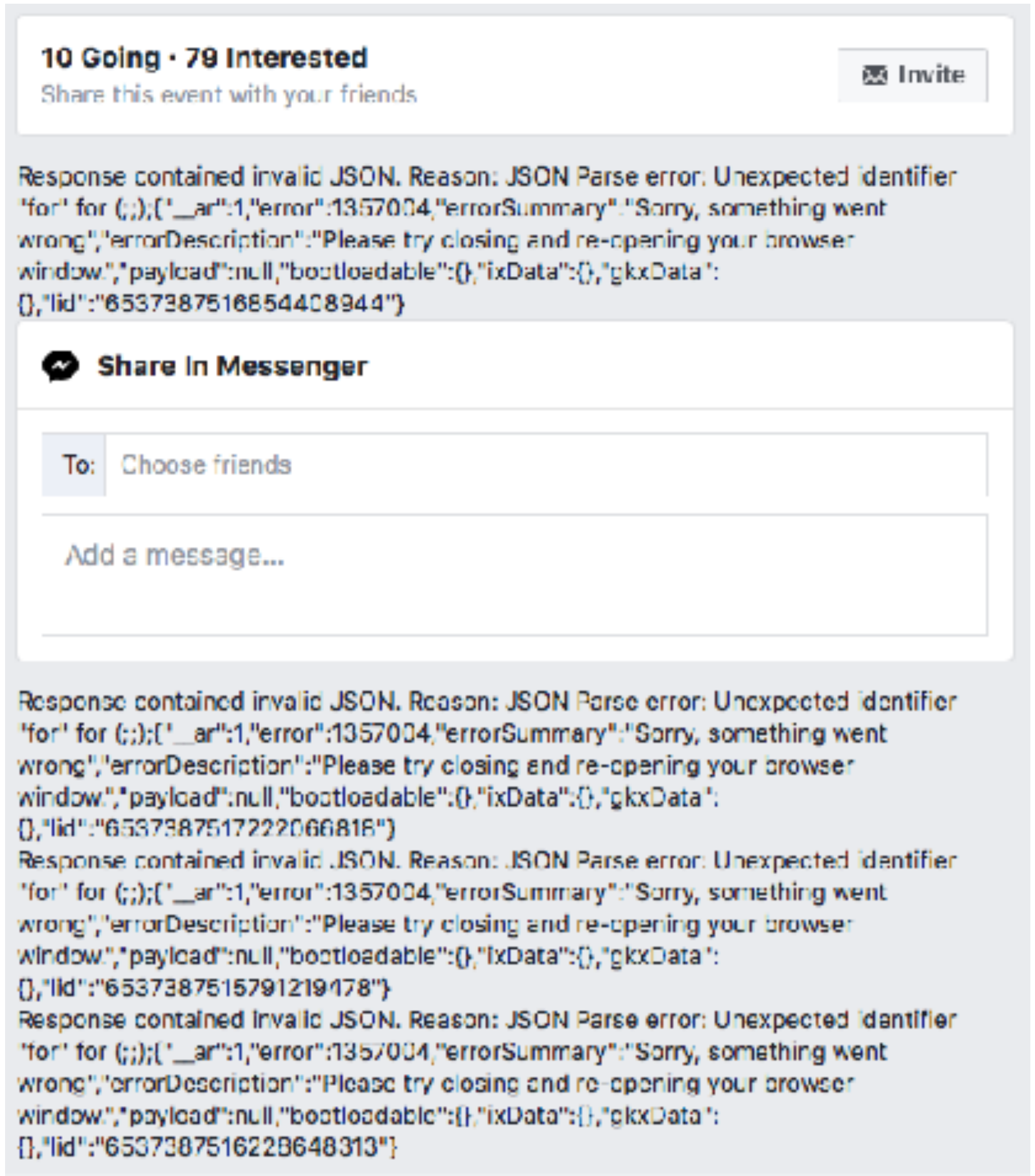
JSON

Ruby

ANGULARJS

python™

JSON IS EVERYWHERE!



Response contained invalid JSON. Reason: JSON Parse error: Unexpected identifier "for" for (;;);{"__ar":1,"error":1357004,"errorSummary":"Sorry, something went wrong","errorDescription":"Please try closing and re-opening your browser window.","payload":null,"bootloadable":{},"ixData":{},"gkxData":{},"lid":"6537387516854408944"}

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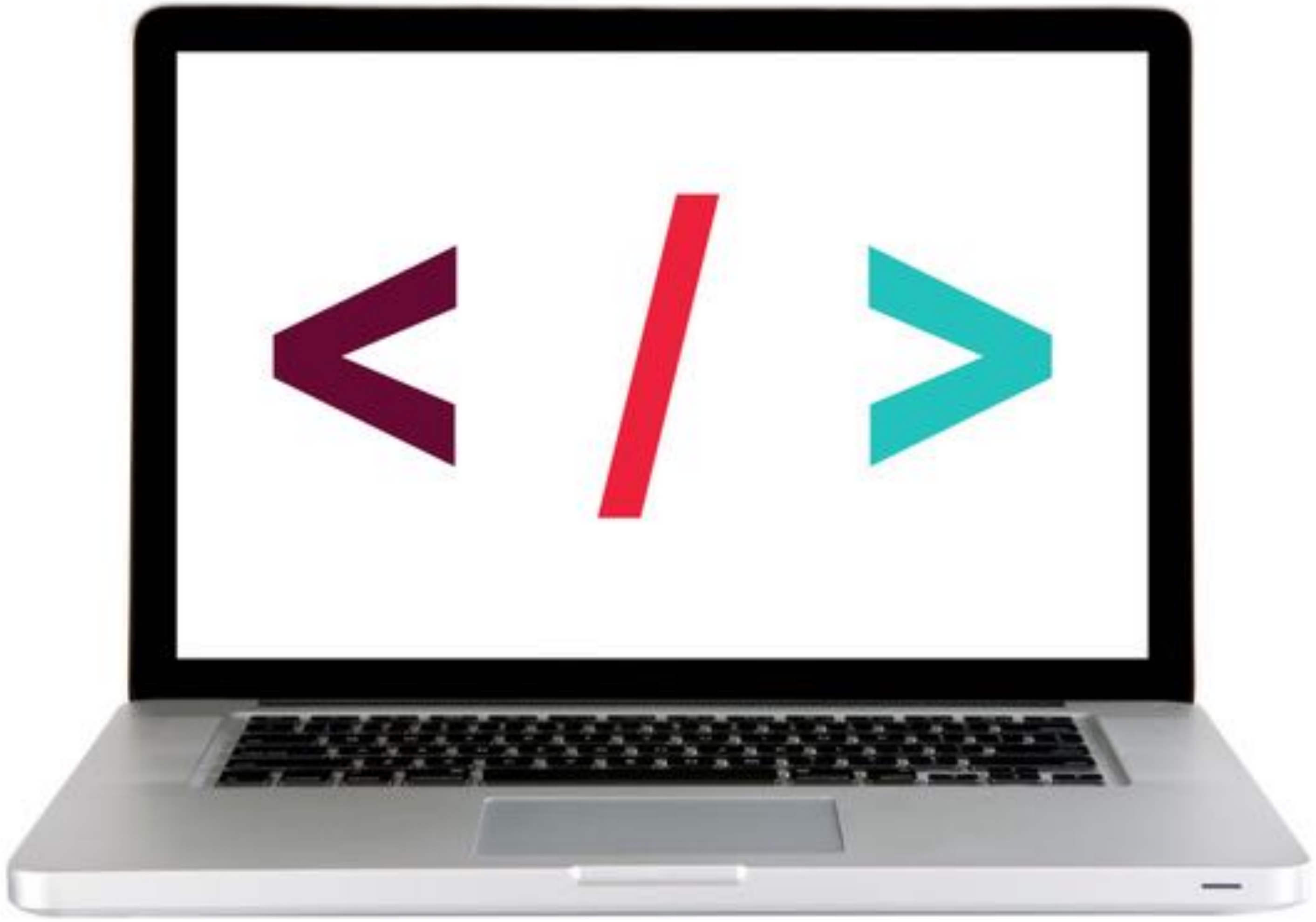
LET'S TAKE A LOOK



JSON RULES

- Property names must be double-quoted strings.
- Trailing commas are forbidden.
- Leading zeroes are prohibited.
- In numbers, a decimal point must be followed by at least one digit.
- Most characters are allowed in strings; however, certain characters (such as ', ", \, and newline/tab) must be 'escaped' with a preceding backslash (\ ) in order to be read as characters (as opposed to JSON control code).
- All strings must be double-quoted.
- No comments!

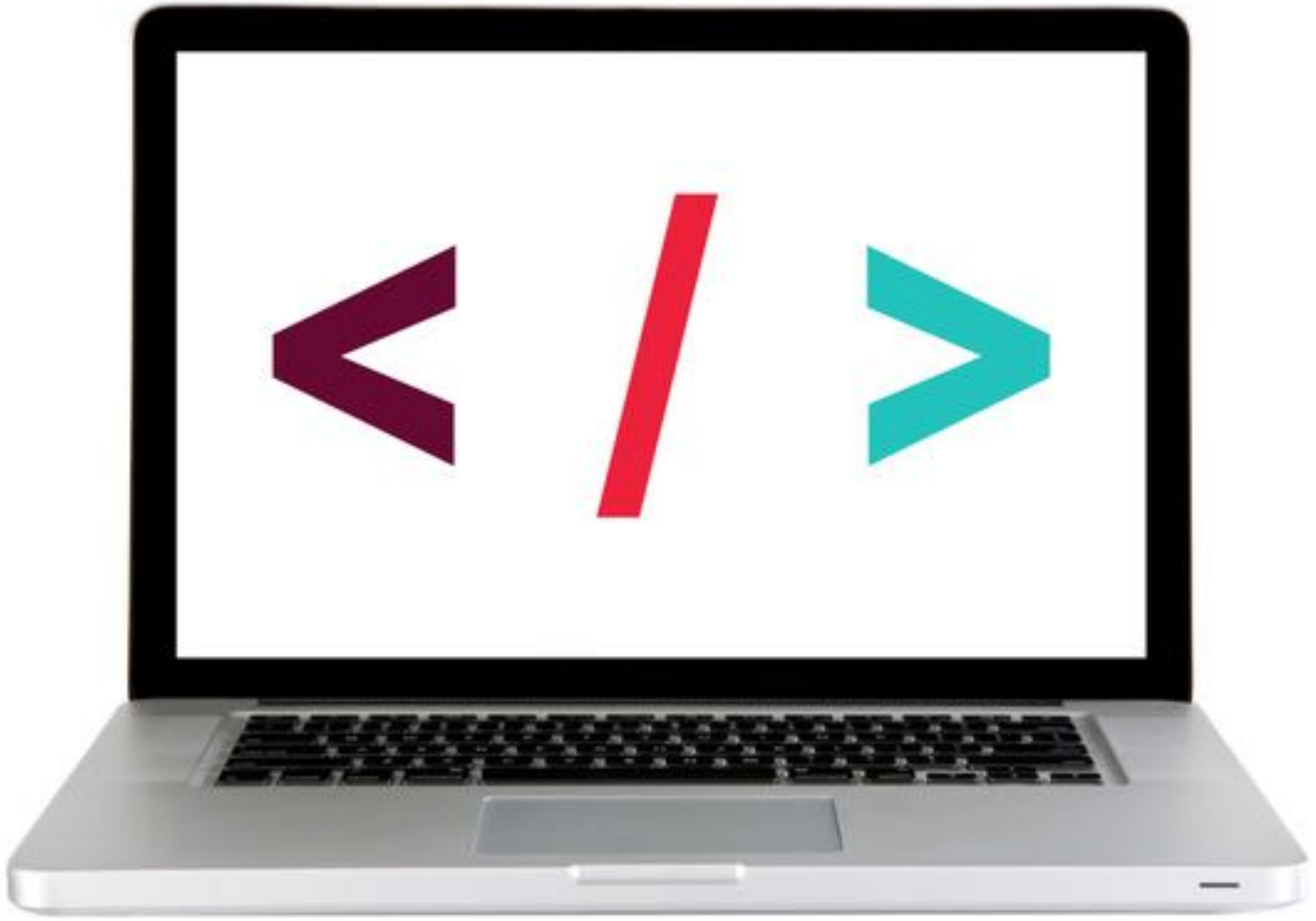
TO CONVERT AN OBJECT TO JSON

```
JSON.stringify(object);
```

TO CONVERT JSON TO AN OBJECT

```
JSON.parse(json);
```

LET'S TAKE A LOOK



EXERCISE — JSON

EXERCISE

KEY OBJECTIVE

- Implement and work with JSON data

TYPE OF EXERCISE

- Pairs

TIMING

3 min

1. Write JSON code that contains an error.
2. Write your code on the wall.
3. When everyone’s code is done, we will look at the code together as a class and practice identifying errors.

LAB — JSON

LAB

KEY OBJECTIVE

- Implement and work with JSON data

TYPE OF EXERCISE

- Individual or pair

TIMING

10 min

1. Open `starter-code > 4-json-exercise > app.js` in your editor.
2. Follow the instructions to write code that produces the stated output.

WORKING WITH NESTED DATA STRUCTURES

YAY, I GOT SOME DATA!

```
let person = '{"firstName":
"Sasha","lastName": "Vodnik","city":
"San Francisco","classes": ["JSD",
"FWD"],"classroom": 3,"launched":
true,"dates": {"start": 20190611,"end":
20190814}}’;
```

WAIT, WHAT?!

WORKING WITH NESTED DATA STRUCTURES

1. PARSE THE JSON TO A JAVASCRIPT OBJECT (OR ARRAY!)
2. VIEW THE RESULTING DATA STRUCTURE
3. LOCATE THE DATA YOU WANT TO REFERENCE
4. IDENTIFY THE DATA TYPE OF THE TOP LEVEL, THEN WRITE CODE TO REFERENCE IT
5. IF NECESSARY, MOVE DOWN A LEVEL, THEN REPEAT PREVIOUS STEP

WORKING WITH NESTED DATA STRUCTURES

1. PARSE THE JSON TO A JAVASCRIPT OBJECT (OR ARRAY!)

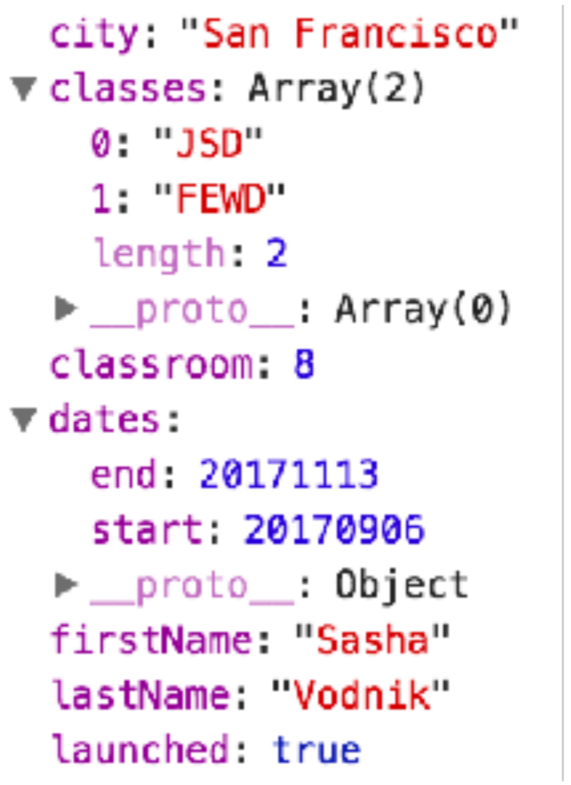
```
let person = '{"firstName":
"Sasha","lastName": "Vodnik","city":
"San Francisco","classes": ["JSD",
"FWD"],"classroom": 3,"launched":
true,"dates": {"start": 20190611,"end":
20190814}}’;
```

```
let personObject = JSON.parse(person);
```

WORKING WITH NESTED DATA STRUCTURES

2. VIEW THE RESULTING DATA STRUCTURE

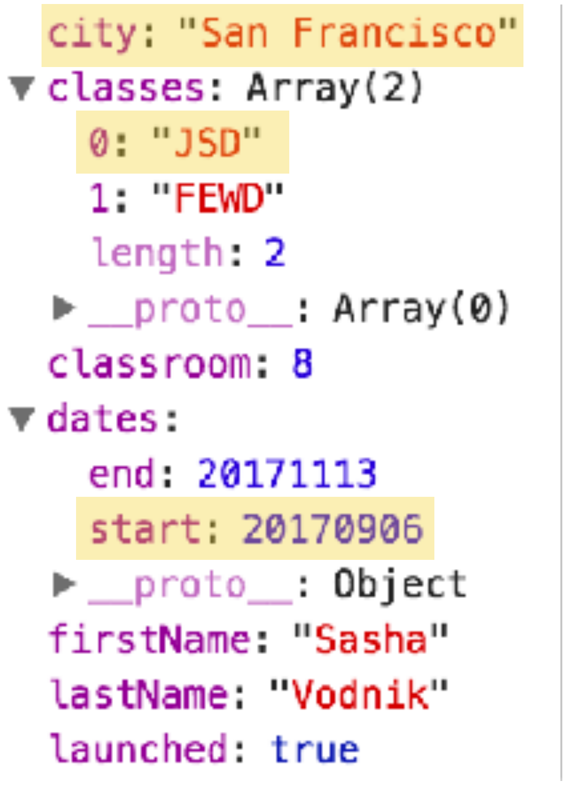
```
let personObject = JSON.parse(person);
console.log(personObject);
>
```



```
  city: "San Francisco"
▼ classes: Array(2)
    0: "JSD"
    1: "FEWD"
    length: 2
  ▶ __proto__: Array(0)
  classroom: 8
▼ dates:
    end: 20171113
    start: 20170906
  ▶ __proto__: Object
  firstName: "Sasha"
  lastName: "Vodnik"
  launched: true
```

WORKING WITH NESTED DATA STRUCTURES

3. LOCATE THE DATA YOU WANT TO REFERENCE



```
  city: "San Francisco"
▼ classes: Array(2)
    0: "JSD"
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    length: 2
  ▶ __proto__: Array(0)
  classroom: 8
▼ dates:
    end: 20171113
    start: 20170906
  ▶ __proto__: Object
  firstName: "Sasha"
  lastName: "Vodnik"
  launched: true
```
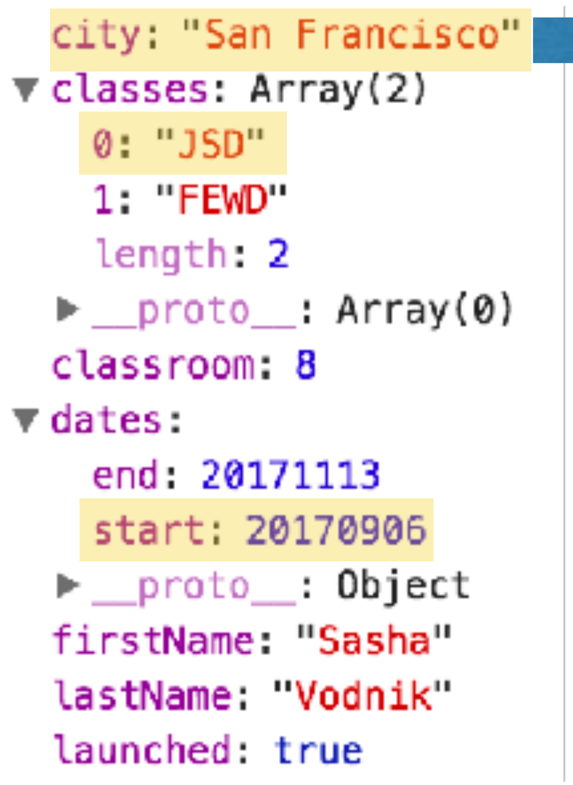

WORKING WITH NESTED DATA STRUCTURES

4. IDENTIFY THE DATA TYPE OF THE TOP LEVEL, THEN WRITE CODE TO REFERENCE IT



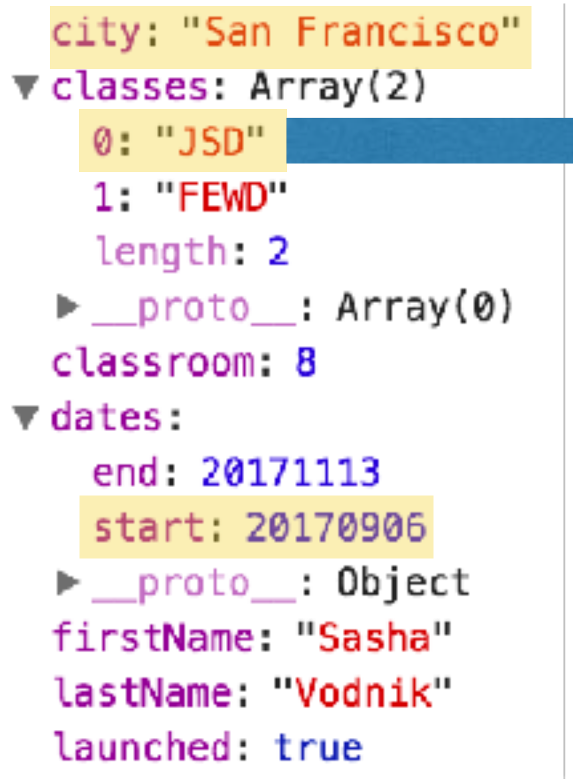
```
  city: "San Francisco"
▼ classes: Array(2)
    0: "JSD"
    1: "FEWD"
    length: 2
  ▶ __proto__: Array(0)
  classroom: 8
▼ dates:
    end: 20171113
    start: 20170906
  ▶ __proto__: Object
  firstName: "Sasha"
  lastName: "Vodnik"
  launched: true
```

direct property:

```
console.log(personObject.city);
> “San Francisco”
```

WORKING WITH NESTED DATA STRUCTURES

4. IDENTIFY THE DATA TYPE OF THE TOP LEVEL, THEN WRITE CODE TO REFERENCE IT
5. IF NECESSARY, MOVE DOWN A LEVEL, THEN REPEAT PREVIOUS STEP



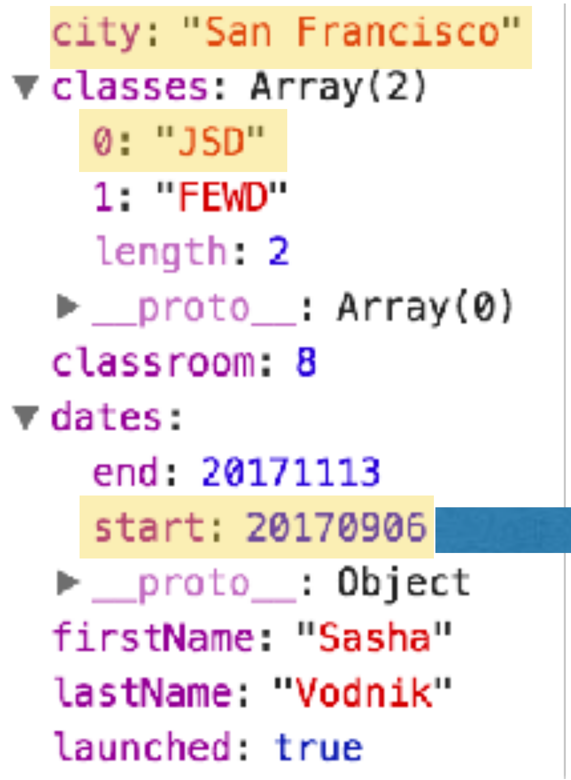
```
  city: "San Francisco"
▼ classes: Array(2)
    0: "JSD"
    1: "FEWD"
    length: 2
  ▶ __proto__: Array(0)
  classroom: 8
▼ dates:
    end: 20171113
    start: 20170906
  ▶ __proto__: Object
  firstName: "Sasha"
  lastName: "Vodnik"
  launched: true
```

direct property > array element

```
console.log(personObject.classes);
> [“JSD”,”FWD”]

console.log(personObject.classes[0]);
> “JSD”
```

WORKING WITH NESTED DATA STRUCTURES

4. IDENTIFY THE DATA TYPE OF THE TOP LEVEL, THEN WRITE CODE TO REFERENCE IT
5. IF NECESSARY, MOVE DOWN A LEVEL, THEN REPEAT PREVIOUS STEP

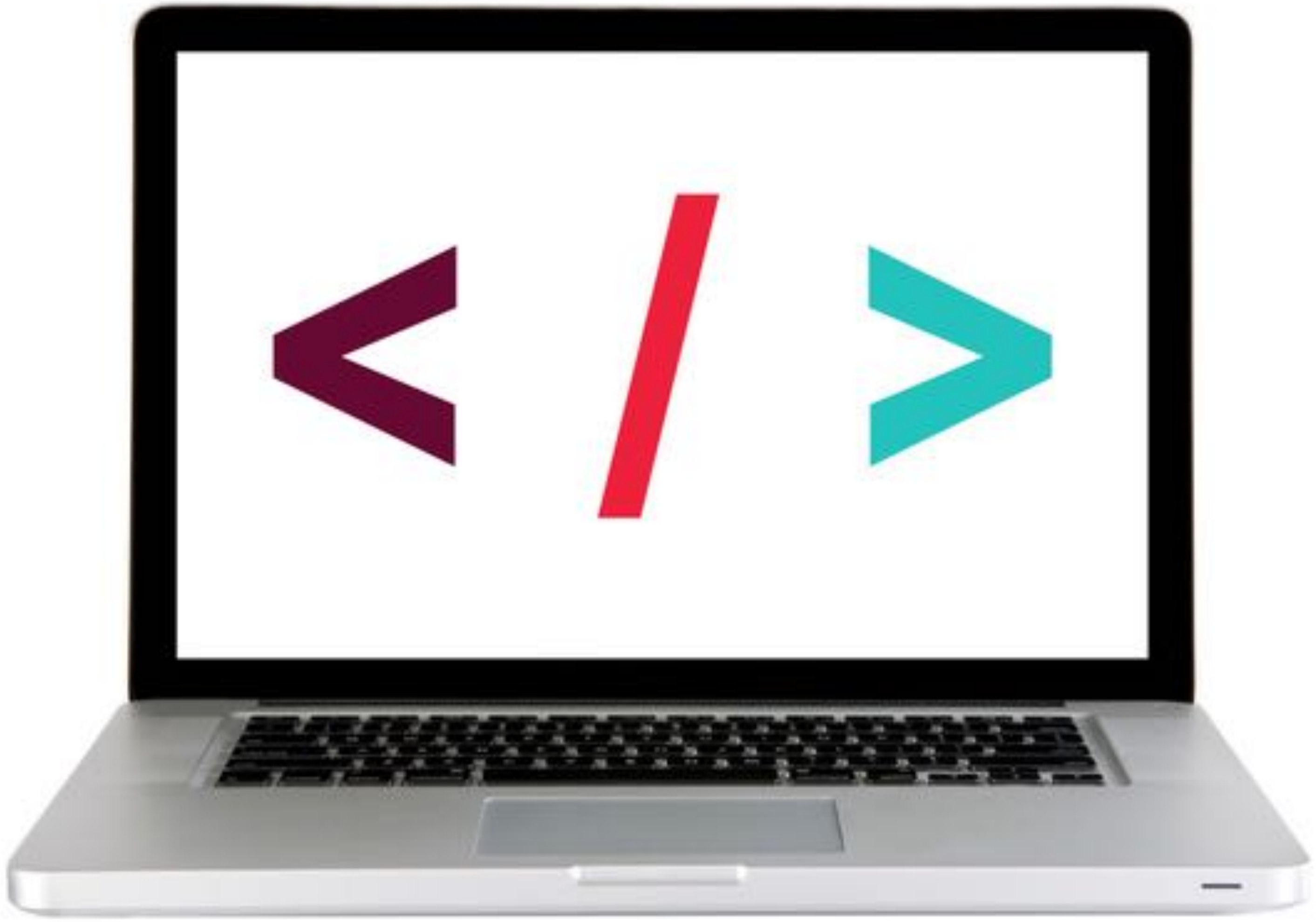


```
  city: "San Francisco"
▼ classes: Array(2)
    0: "JSD"
    1: "FEWD"
    length: 2
  ▶ __proto__: Array(0)
  classroom: 8
▼ dates:
    end: 20171113
    start: 20170906
  ▶ __proto__: Object
  firstName: "Sasha"
  lastName: "Vodnik"
  launched: true
```

direct property > nested object property

```
console.log(personObject.dates);
> {end:20171113,start:20170906}

console.log(personObject.dates.start);
> 20170906
```

LET'S TAKE A LOOK



LAB — JSON

LAB

KEY OBJECTIVE

- Implement and work with JSON data

TYPE OF EXERCISE

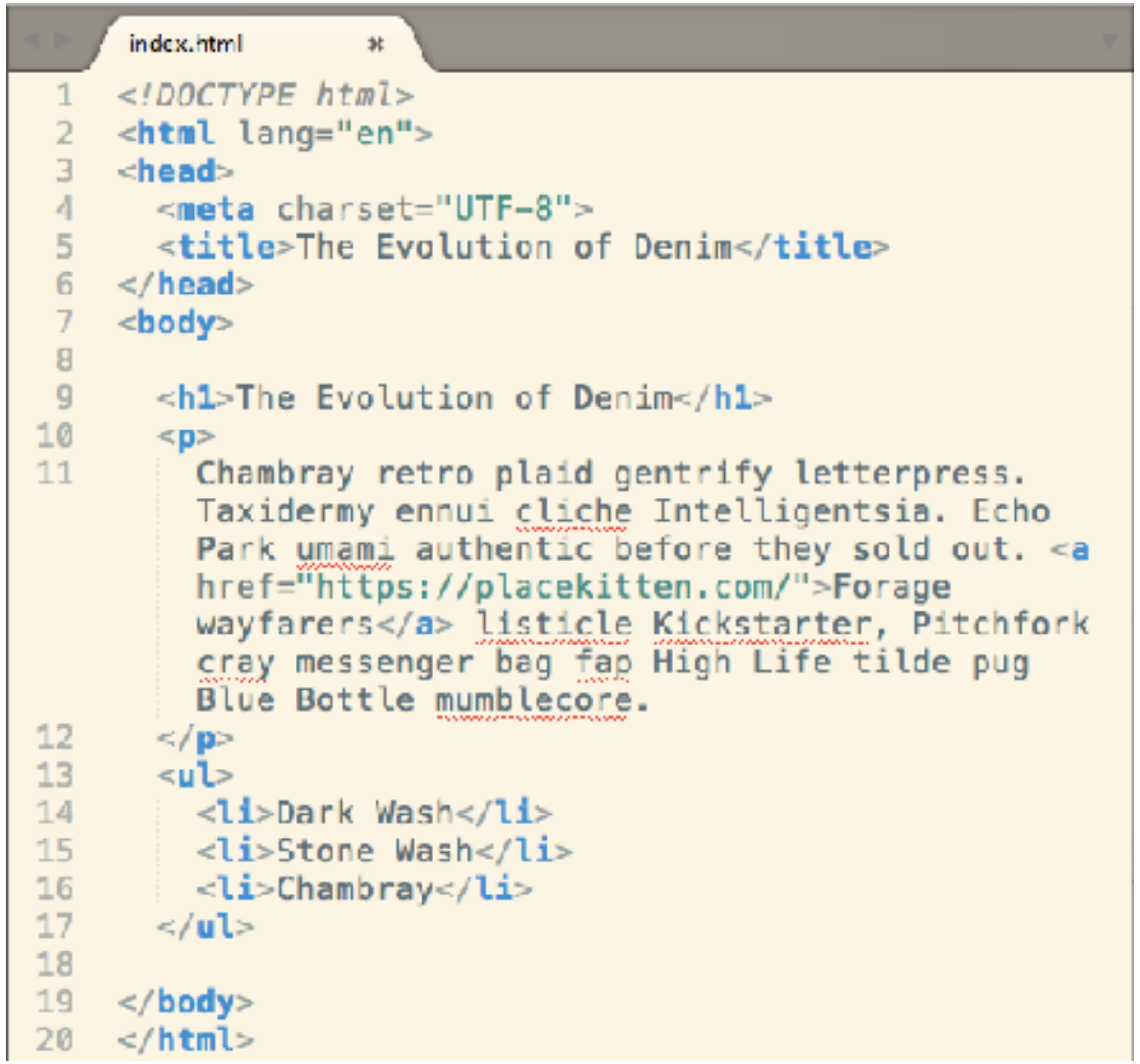
- Individual or pair

TIMING

5 min

1. Open `starter-code > 5-data-structure—exercise > app.js` in your editor.
2. Follow the instructions to write code that produces the stated output.

DOM TREE — HTML FILE

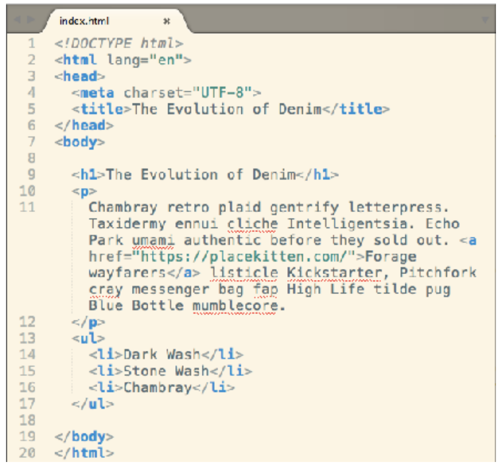


index.html

```html
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
  <title>The Evolution of Denim</title>
</head>
<body>

  <h1>The Evolution of Denim</h1>
  <p>
    Chambray retro plaid gentrify letterpress.
    Taxidermy ennui cliche Intelligentsia. Echo
    Park umami authentic before they sold out. <a
    href="https://placekitten.com/">Forage
    wayfarers</a> listicle Kickstarter, Pitchfork
    cray messenger bag fap High Life tilde pug
    Blue Bottle mumblecore.
  </p>
  <ul>
    <li>Dark Wash</li>
    <li>Stone Wash</li>
    <li>Chambray</li>
  </ul>

</body>
</html>
```

DOM TREE

- The browser pulls in this HTML document, analyzes it, and creates an *object model* of the page in memory.
- This model is called the *Document Object Model (DOM)*.
- The DOM is structured like a tree, a DOM Tree, like in the model below:


index.html

```
<!DOCTYPE html>
<html lang="en">
<head>
  <meta charset="UTF-8">
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</head>
<body>

  <h1>The Evolution of Denim</h1>
  <p>
    Chambray retro plaid gentrify letterpress.
    Taxidermy ennui cliche Intelligentsia. Echo
    Park umami authentic before they sold out. <a
    href="https://placekitten.com/">Forage
    wayfarers</a> listicle Kickstarter, Pitchfork
    cray messenger bag fap High Life tilde pug
    Blue Bottle mumblecore.
  </p>
  <ul>
    <li>Dark Wash</li>
    <li>Stone Wash</li>
    <li>Chambray</li>
  </ul>

</body>
</html>
```
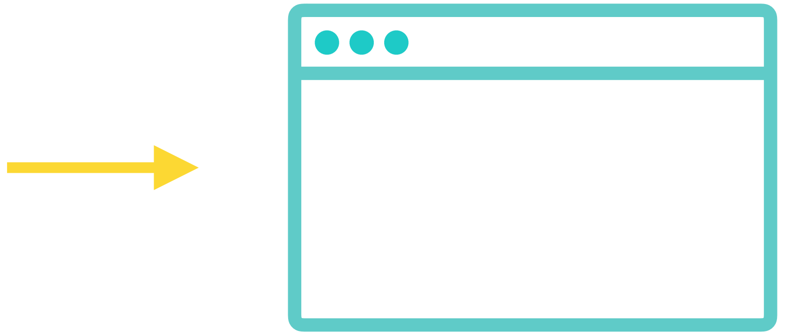
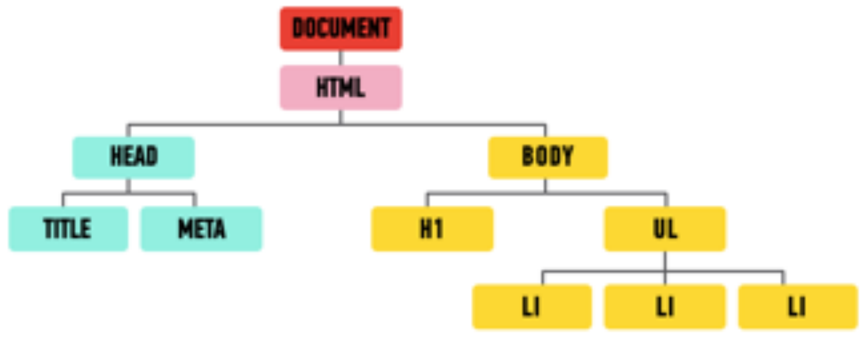
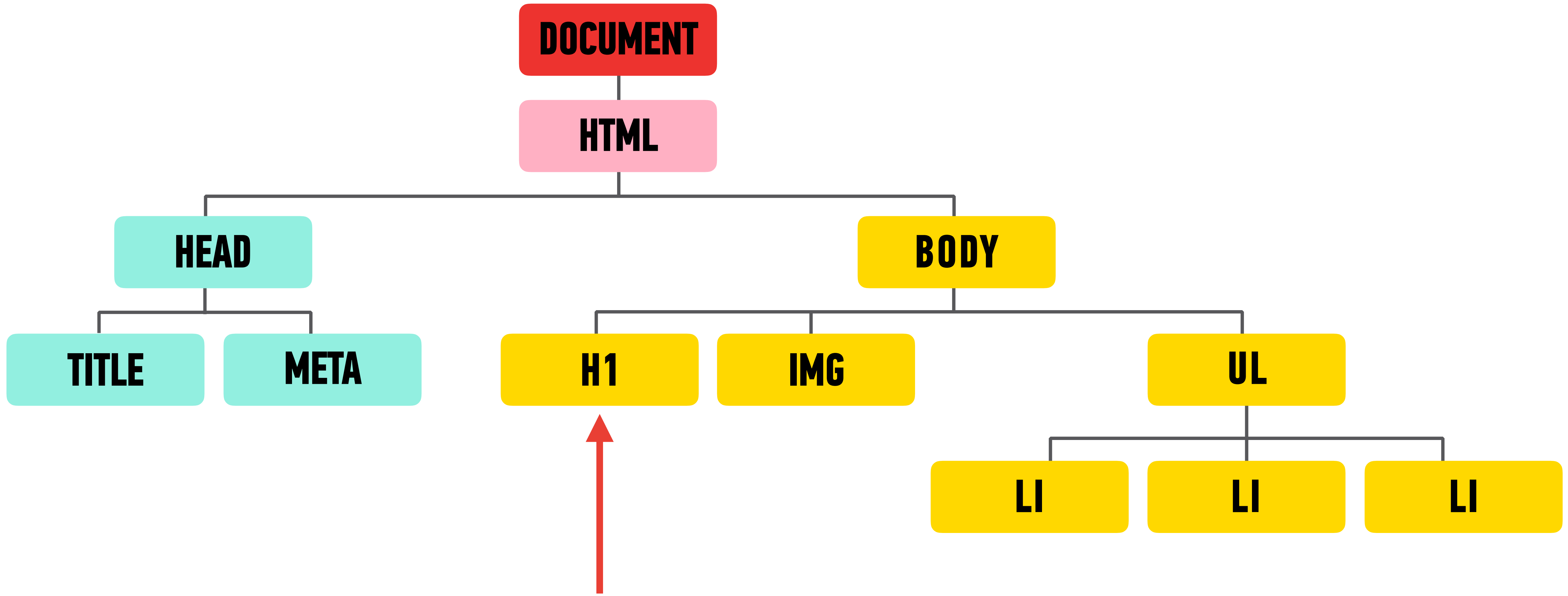





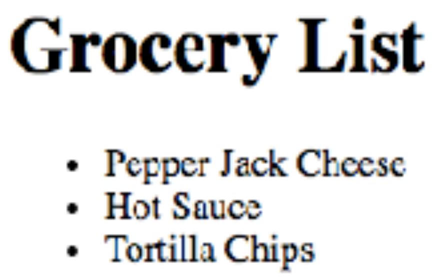
DOM TREE



- Each element in the HTML document is represented by a *DOM node*.
- You can think of a node as a live object that you can access and change using JavaScript.
- When the model is updated, those changes are reflected on screen.

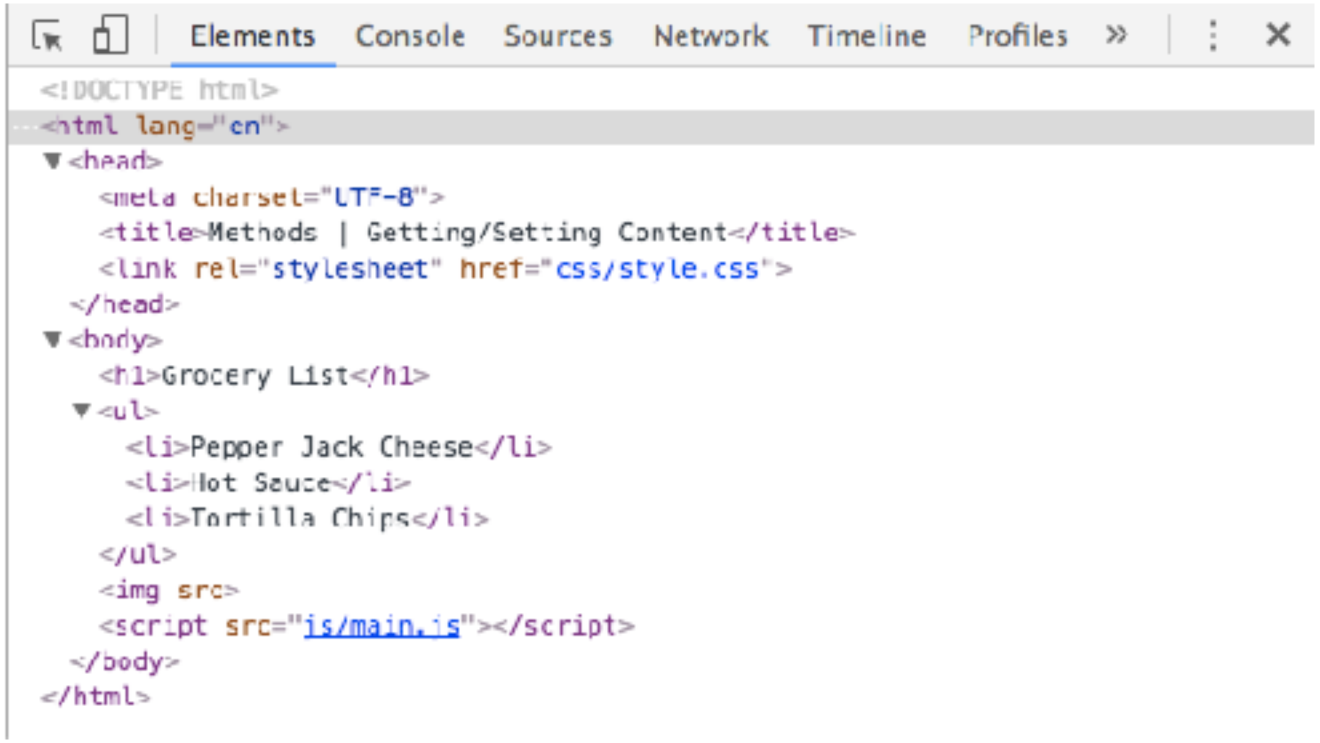
DOM TREE

- In Chrome, you can go to View > Developer > Developer Tools and click on the Elements panel to take a look at the DOM tree.



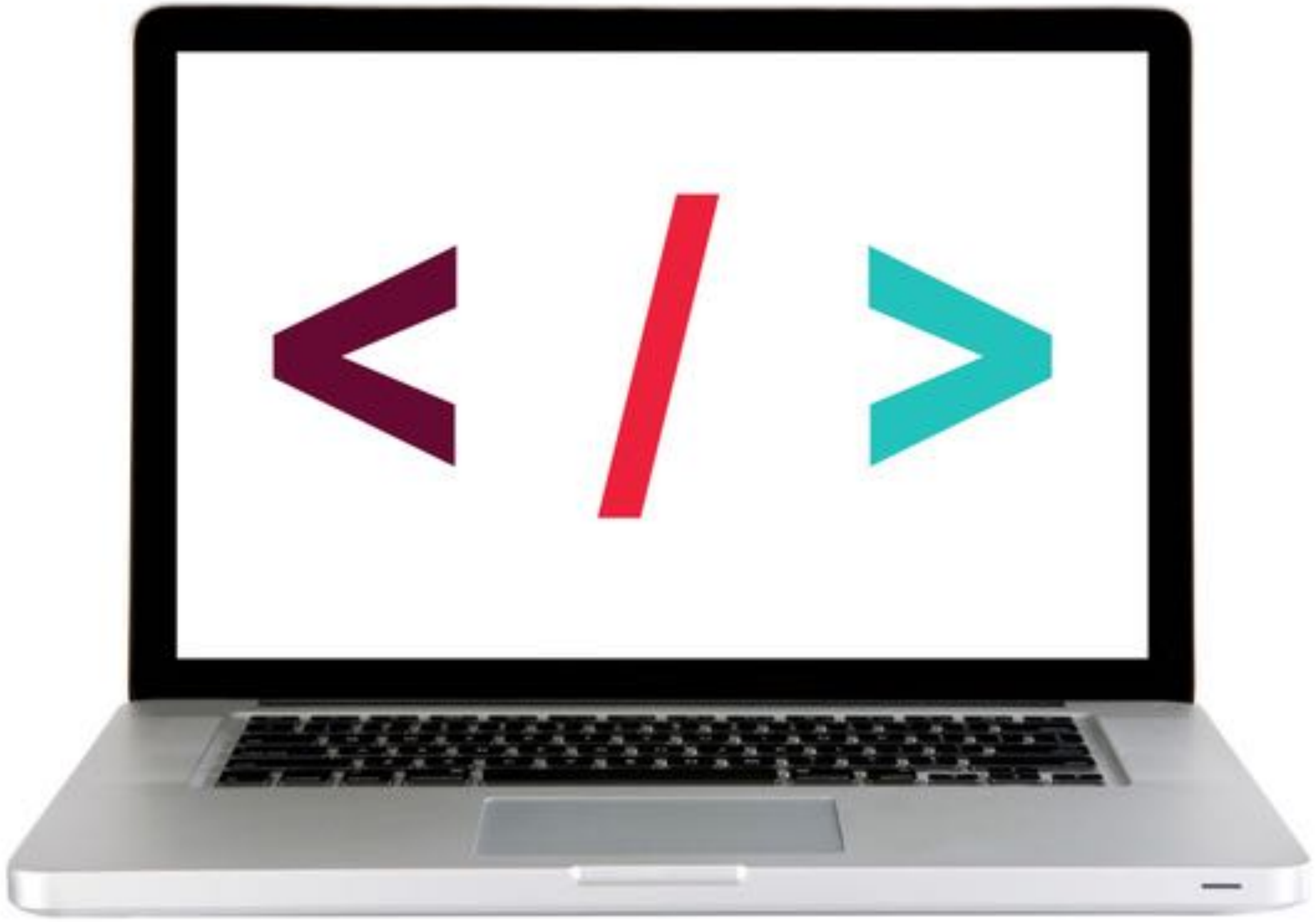
Grocery List

- Pepper Jack Cheese
- Hot Sauce
- Tortilla Chips



```
<!DOCTYPE html>
<html lang="en">
▼<head>
    <meta charset="UTF-8">
    <title>Methods | Getting/Setting Content</title>
    <link rel="stylesheet" href="css/style.css">
  </head>
▼<body>
    <h1>Grocery List</h1>
  ▼<ul>
      <li>Pepper Jack Cheese</li>
      <li>Hot Sauce</li>
      <li>Tortilla Chips</li>
    </ul>
    <img src>
    <script src="js/main.js"></script>
  </body>
</html>
```

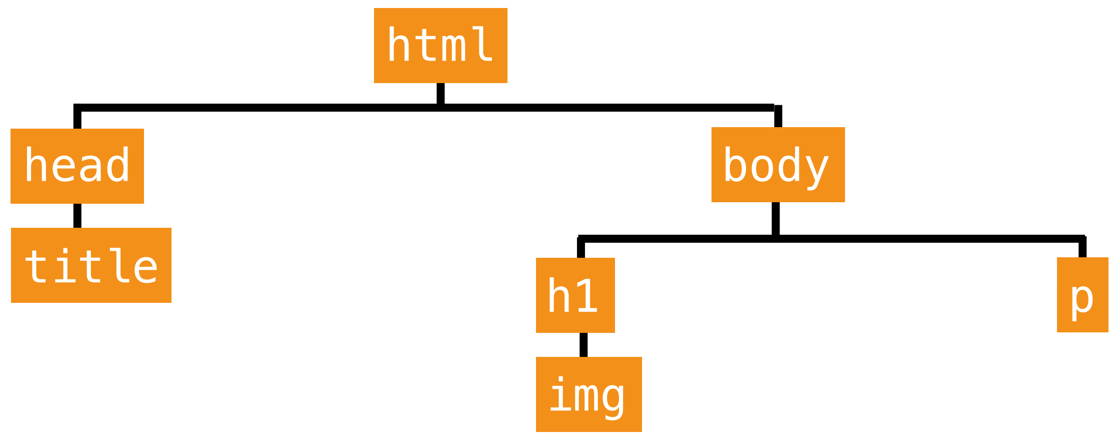
LET'S TAKE A LOOK



Web page elements

```
<html>
  <head>
    <title>JavaScript Basics</title>
  </head>
  <body>
    <h1>
      <img src="logo.png" alt="JS Basics">
    </h1>
    <p>First, master HTML and CSS.</p>
  </body>
</html>
```

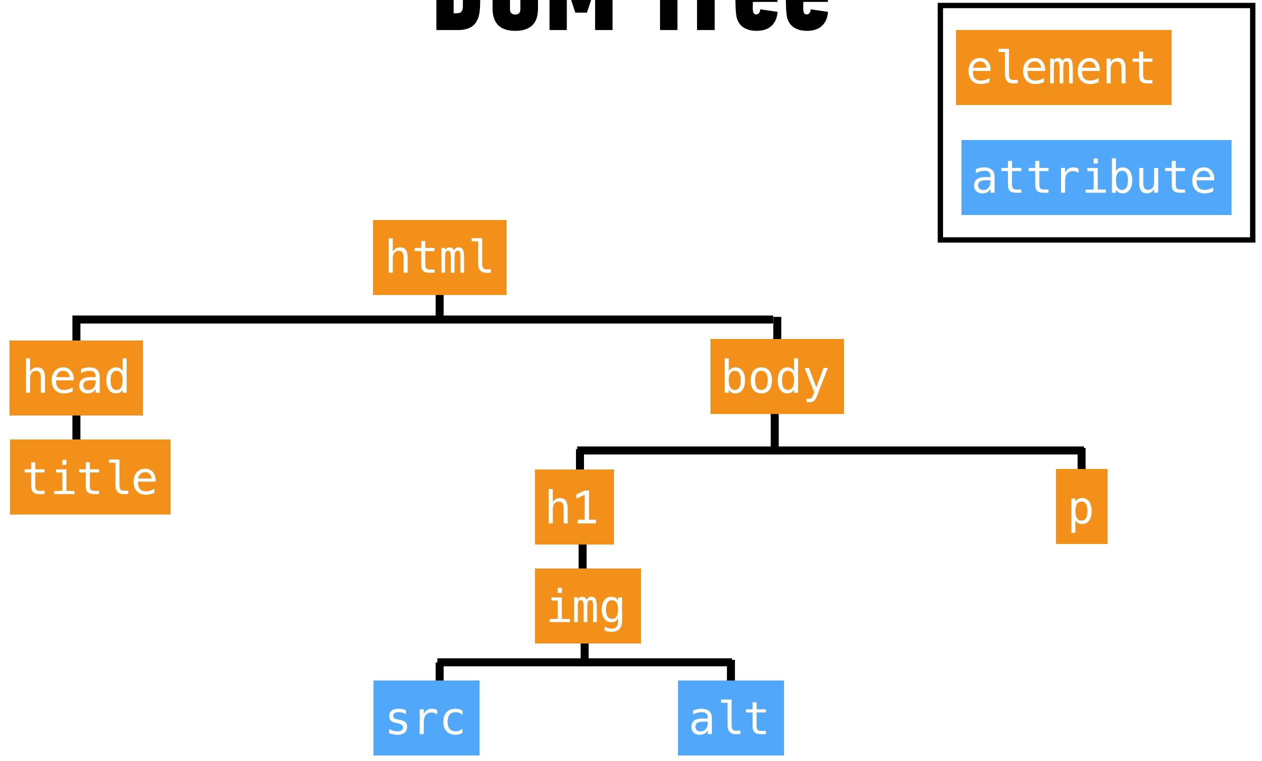
DOM Tree



Web page elements

```
<html>
  <head>
    <title>JavaScript Basics</title>
  </head>
  <body>
    <h1>
      <img src="logo.png" alt="JS Basics">
    </h1>
    <p>First, master HTML and CSS.</p>
  </body>
</html>
```

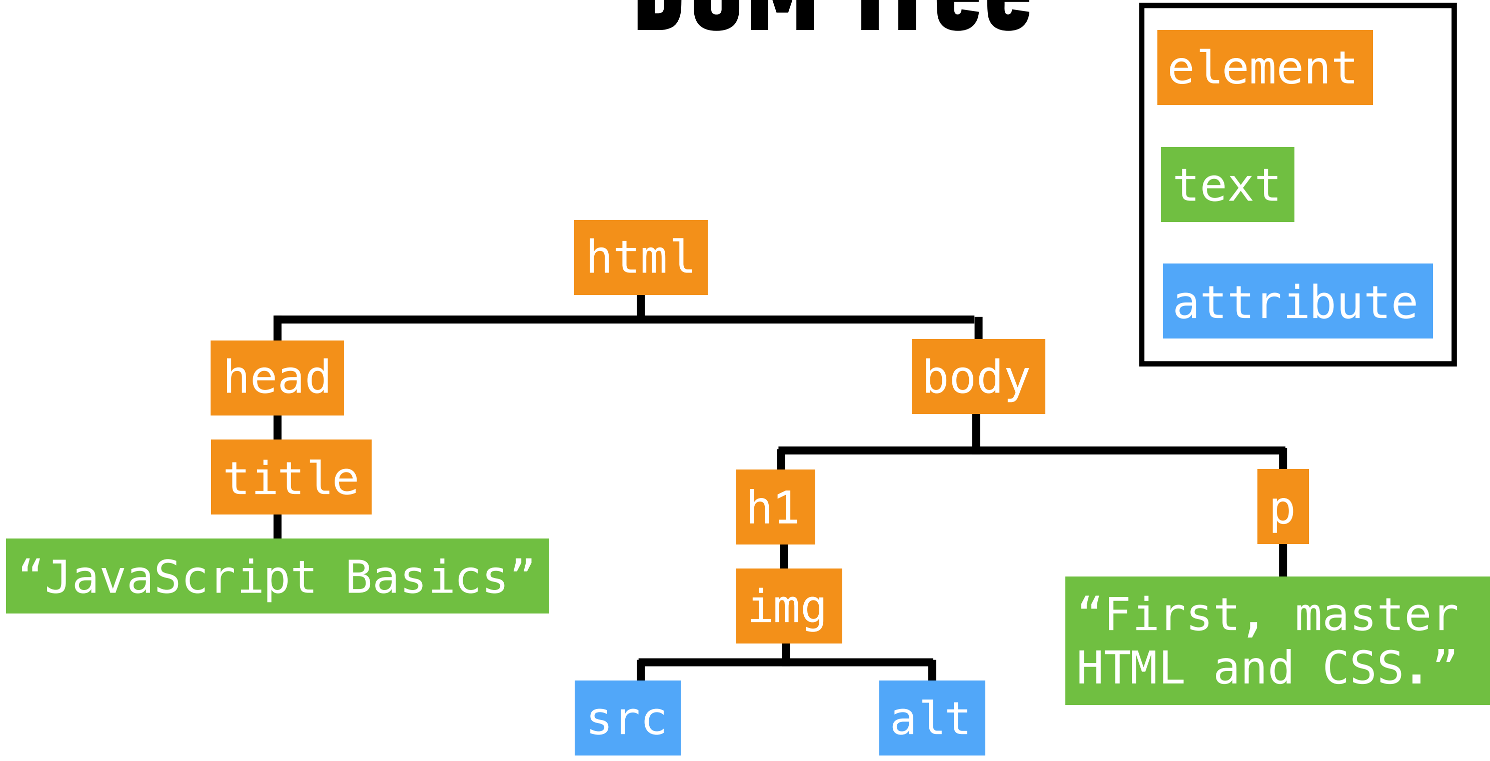
DOM Tree



Web page elements

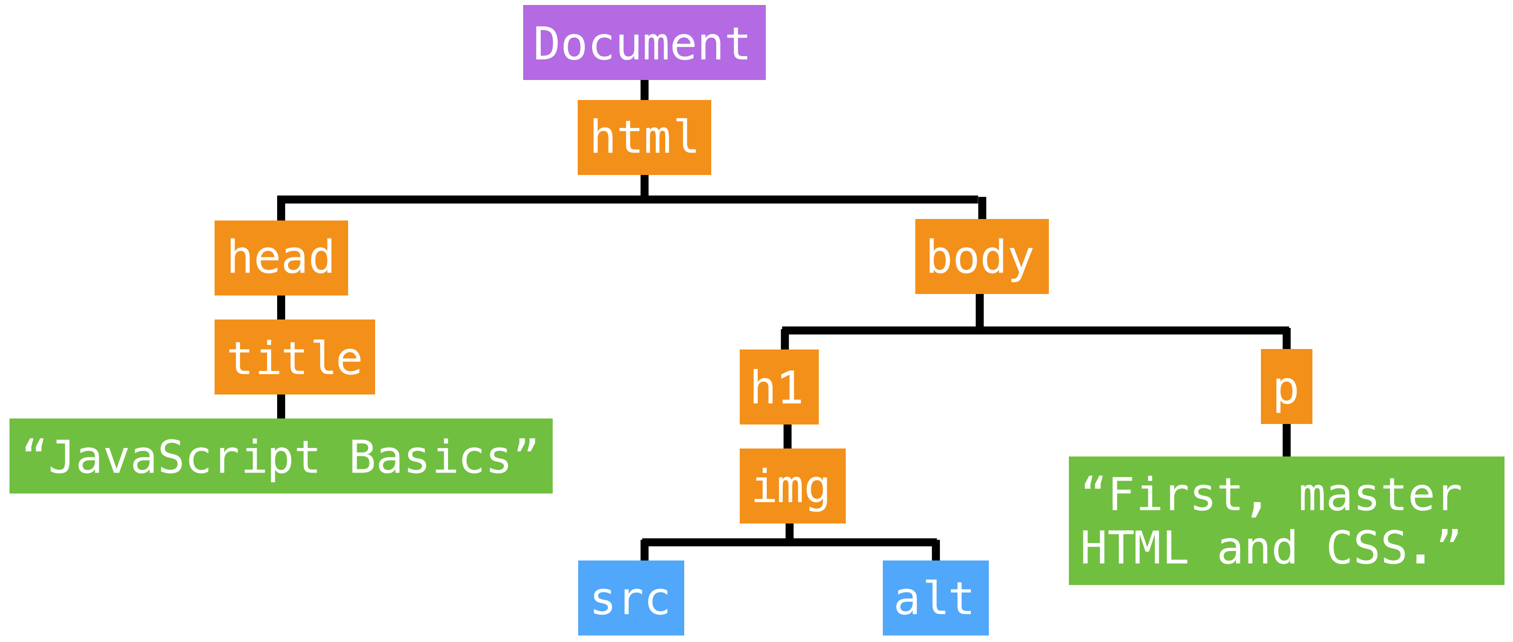
```
<html>
  <head>
    <title>JavaScript Basics</title>
  </head>
  <body>
    <h1>
      <img src="logo.png" alt="JS Basics">
    </h1>
    <p>First, master HTML and CSS.</p>
  </body>
</html>
```

DOM Tree



The `Document` object

- Created by the browser
- Contains all web page elements as descendant objects
- Also includes its own properties and methods



EXERCISE

EXERCISE

KEY OBJECTIVE

- Identify differences between the DOM and HTML

TYPE OF EXERCISE

- Pairs

TIMING

2 min	1. Discuss how the DOM is different from a page’s HTML

SELECTING DOM ELEMENTS

Selecting an element in the DOM

- `getElementById()`
- `getElementsByClassName()`
- `getElementsByTagName()`
- `querySelector()`
- `querySelectorAll()`

Let us select DOM elements using CSS selector syntax

CSS SELECTORS

CSS SELECTORS REVIEW

Selecting all instances of an element

the name of the element as a string

```
'div'
```

Selecting all instances of multiple elements

the names of the elements separated by commas, as a single string

```
'div, span'
```

Selecting the element with a specified ID value

the hash symbol (#) followed by the name of the ID value

```
'#top'
```

Selecting all elements with a specified class value

a period (.) followed by the name of the class value

```
'.pullquote'
```

Selecting all elements with a given relationship

the hierarchical relationship, ending with the element to select

```
'div p a'
```

Selecting all elements with a given relationship

the hierarchical relationship, ending with the element to select

```
'div p .pullquote'
```

CSS SELECTORS QUIZ

Select all paragraph elements and list item elements

```
'p li'
```

Select all paragraph elements and list item elements

```
'p, li'
```

Select unordered lists within divs

```
'ul div'
```

Select unordered lists within divs

```
'div ul'
```

Select the element with the ID value ‘main’

```
'main'
```

Select the element with the ID value 'main'

```
'#main'
```

Select the elements with the class value ‘col3’

```
':col3'
```

Select the elements with the class value ‘col3’

```
'.col3'
```

Select the elements with the class value ‘col3’ nested within div elements

```
'div.col3'
```

Select the elements with the class value ‘col3’ nested within div elements

```
'div .col3'
```

querySelector()

- Takes a single argument, a string containing CSS selector

HTML

```
<body>
  …
  <p id=“main”>Lorem ipsum</p>
  …
</body>
```

JavaScript

```
document.querySelector(‘#main’);
```

querySelector()

- Selects the **first** DOM element that matches the specified CSS selector

```
<body>
  …
  <ul>
    <li>Lorem ipsum</li>
    <li>Lorem ipsum</li>
    <li>Lorem ipsum</li>
  </ul>
…
</body>
```

JavaScript

```
document.querySelector(‘li’);
```

querySelectorAll()

- Takes a single argument, a string containing CSS selector
- Selects all DOM elements that match this CSS selector
- Returns a NodeList, which is similar to an array

```
<body>
  …
  <ul>
    <li>Lorem ipsum</li>
    <li>Lorem ipsum</li>
    <li>Lorem ipsum</li>
  </ul>
…
</body>
```

JavaScript

```
document.querySelectorAll(‘li’);
```

WORKING WITH SELECTED ELEMENTS

What can we do with a selected element?

- Get and set the text within it with the `textContent` property
- Get and set the HTML within it with the `innerHTML` property
- Get and set its attribute values by referencing them directly (`id`, `src`, etc.)

textContent

- Gets the existing text content of an element

```
let item = document.querySelector(‘li’);

console.log(item.textContent)
// Gets value: “Lorem ipsum”
```

textContent

- Sets new text content in an element

```
let item = document.querySelector(‘li’);

item.textContent = ‘Apples’
// Sets value: ‘Apples’
```

innerHTML

- Gets the existing content of an element, including any nested HTML tags

```
let item = document.querySelector(‘li’);

console.log(item.innerHTML)
// Gets value: “<strong>Lorem ipsum</strong>”
```

innerHTML

- Sets new content in an element, including nested HTML tags

```
let item = document.querySelector(‘li’);

item.innerHTML = ‘<em>Apples</em>’
// Sets value: ‘<em>Apples</em>’
```

`className` property

- Gets an element’s `class` attribute value

```
let item = document.querySelector(‘li’);

console.log(item.className) // Gets value: ‘default’
```

`className` property

- Sets an element's `class` attribute value
- CSS style sheet contains a style rule for each class
  - Appearance of element changes based on which class is applied
  - This is the best practice.

```
let item = document.querySelector('li');

item.className = 'selected'
// Sets value: 'selected'
```

`classList.add` method

- Adds specific `class` attribute value(s)

```
let item = document.querySelector(‘li’);

item.classList.add(‘selected’);
// Adds value: ‘selected’
```

`classList.remove` method

- Removes specific `class` attribute value(s)

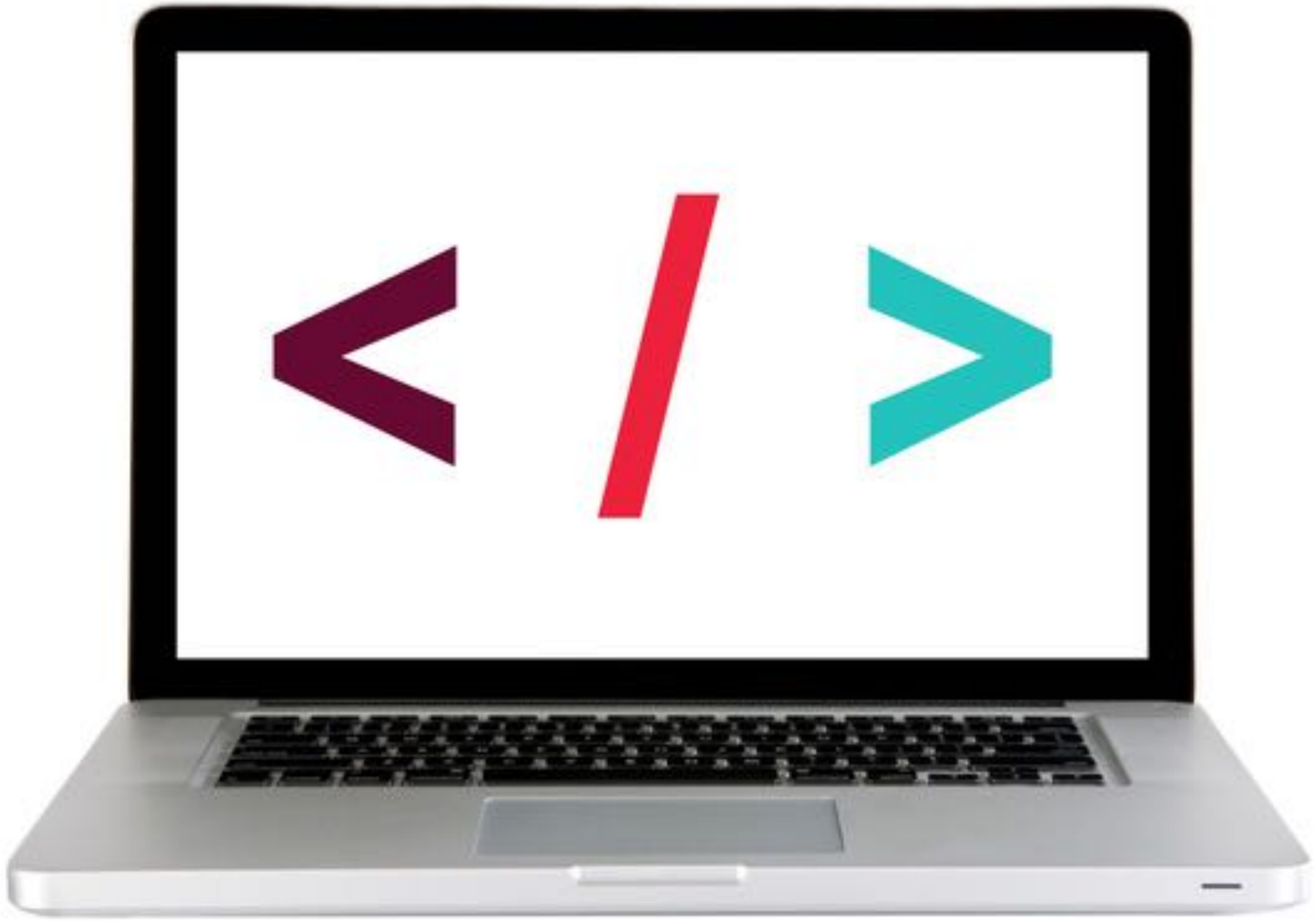
```
let item = document.querySelector(‘li’);

item.classList.remove(‘default’);
// Removes value: ‘default’
```

`classList.toggle` method

- Removes existing or adds missing `class` attribute value(s)

```
let item = document.querySelector(‘li’);

item.classList.toggle(‘selected’);
// Adds value ‘selected’ if not already in collection
// Removes value 'selected' if already in collection
```

LET'S TAKE A LOOK



LAB — DOM

LAB

KEY OBJECTIVE

- Use vanilla JavaScript methods and properties to create and modify DOM nodes.

TYPE OF EXERCISE

- Individual or pair

TIMING

5 min

1. Open `starter-code > 4-dom-exercise > app.js` in your editor.
2. Follow the instructions to write code that selects and modifies the indicated elements and content.

LAB — DOM

LAB

KEY OBJECTIVE

- Use vanilla JavaScript methods and properties to create and modify DOM nodes.

TYPE OF EXERCISE

- Individual or pair

TIMING

5 min

1. Open `starter-code > 5-dom-attributes-exercise > app.js` in your editor.
2. Follow the instructions to write code that selects and modifies the indicated elements and content.

CREATING DOM ELEMENTS

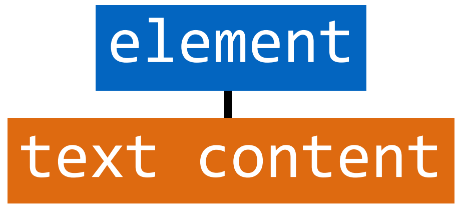
Adding content to the DOM

1. create a new element with `document.createElement()`

`element`

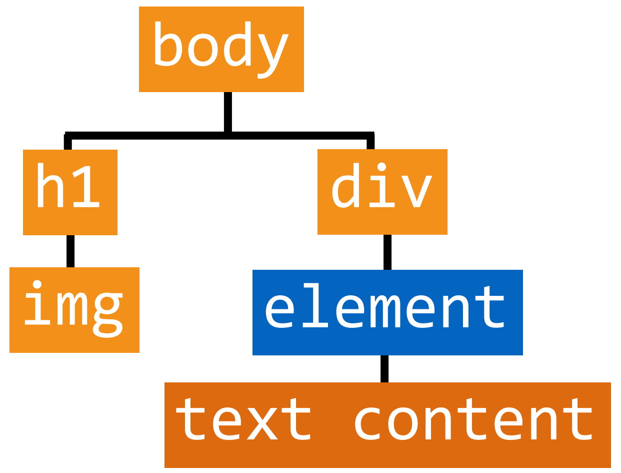
Adding content to the DOM

1. create a new element with `document.createElement()`
2. add text content to that element with the `textContent` or `innerHTML` property



Adding content to the DOM

1. create a new element with `document.createElement()`
2. add text content to that element with the `textContent` or `innerHTML` property
3. attach the new element to the DOM with `appendChild()`



createElement()

- Creates a new element

```
document.createElement(‘li’); // creates an li element
```

- Created element isn’t attached to DOM
  - assign variable when creating so you can reference later

```
let item1 = document.createElement(‘li’);
let item2 = document.createElement(‘li’);
```

textContent or innerHTML

- Specifies content of an element

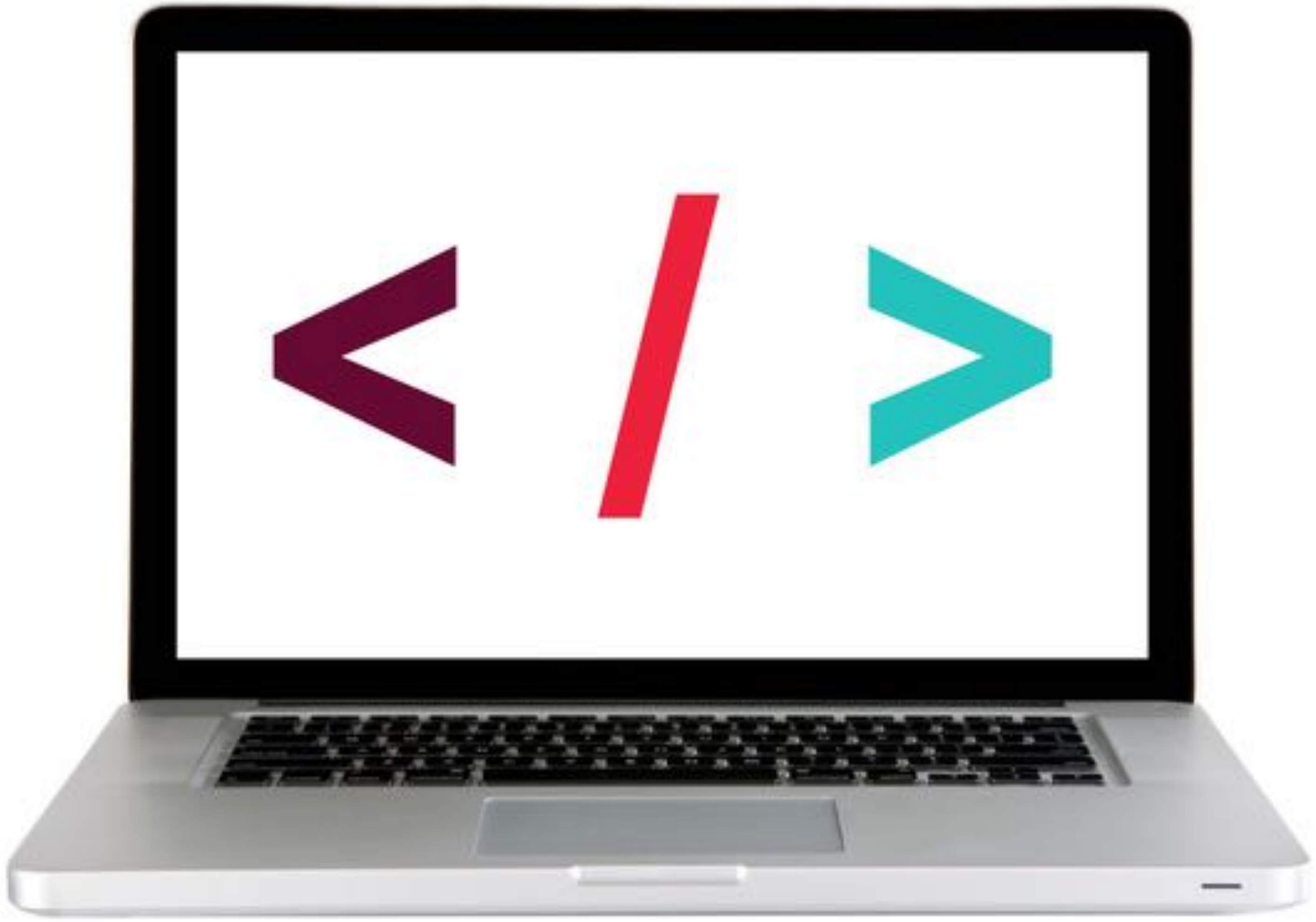
```
item1.textContent =’banana’;
item2.textContent =‘apple’;
```

`appendChild()`

- Attaches element or node as child of specified element
  - Attaching to a DOM element makes it part of the DOM
- Syntax:
  `parent``.appendChild(`*`child`*`);`

```
let list = document.querySelector(‘ul’); // selects ul element
list.appendChild(item1);    // adds item1 li to list ul
list.appendChild(item2);    // adds item2 li to list ul
```

LET'S TAKE A LOOK



EXERCISE – ADD CONTENT TO A WEB PAGE USING JAVASCRIPT

EXERCISE

LOCATION

- `starter-code > 7-create-append-lab`

TIMING

until 9:20

1. Open preview.png. Your task is to use DOM manipulation to build the sidebar shown in the image and add it to the blog.html web page.
2. Open app.js in your editor, then follow the instructions to create and the “About us” heading and the 2 paragraphs of text to the sidebar.
3. BONUS 1: Open preview-bonus.png, then write JavaScript code to add the image shown to the sidebar. (Filename and location in app.js.)
4. BONUS 2: Create and append the “Recent issues” heading and list.

Exit Tickets!

(Class #6)

LEARNING OBJECTIVES - REVIEW

- Describe what hoisting does
- Identify likely objects, properties, and methods in real-world scenarios
- Create JavaScript objects using object literal notation
- Implement and interface with JSON data

NEXT CLASS PREVIEW

Intro to DOM & jQuery

- Identify differences between the DOM and HTML.
- Use vanilla JavaScript methods and properties to create and modify DOM nodes.
- Create DOM event handlers using vanilla JavaScript.
- Select DOM elements and properties using jQuery.
- Manipulate the DOM by using jQuery selectors and functions.
- Create DOM event handlers using jQuery.

Q&A