Functions

Functions

- Functions are bits of codes that you can reuse
- Functions have a special syntax

```
function functionName(parameters){
  code you want to run
}
```

Function Declaration

```
function welcomeMsg(msg){
   alert(msg)
}
function welcomeMsg(){
   alert("Welcome to JavaScript!")
}
```

Function call

- Declaring a function doesn't actual do anything
- You need to call the function
- Calling a function changes the program flow

```
var x = "Hello"
welcomeMsg(x)
x = "Goodbye"
welcomeMsg(x)
```

```
function welcomeMsg(msg){
    alert(msg)
}
```

Parameters

- Sometimes functions need some information in order to perform its "function"
- The names of the parameters are not important, as long as you are consistent

Return values

- Some function return values
- These values can be used in assignment statements or conditional expressions

Return values

```
var firstName = welcomeMsg("Hi")
```

```
function welcomeMsg(msg){
    alert(msg);
    var name = prompt("What is your name?")
    return name
}
```

Review

- Whenever possible, use built in functions
- When you need to write your own function, try not to be too specific
- Function parameters can have any name

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Code Placement

Where To Place the Code

- Now that you are going to start to write your own functions, it is easier to separate code from content
- JavaScript code can be placed in the body, head, or in an external file

In the head

- When JavaScript functions are declared in the head section they are separated from the content
- Use the script tag
- Have access to all of the document information (ids, classes, etc.)

Code can be placed in the <head>

```
<head>
    <script>
        function message(){
        alert("This alert box was called with the online event")}
    </script>
</head>
<body>
    <h1>Functions</h1>
    <script>
        message()
    </script>
</body>
```

In an External File

- When JavaScript functions are in a separate file it is possible to reuse the code in multiple files
- Don't use the script tag

In an External File

```
<head>
    <script src="js/two-external.js"></script>
</head>
<body>
    <h1>Functions</h1>
        <script>
            message()
        </script>
</body>
```

Debugging Your Code

- As your code becomes more complex, make sure that you are using your debugger
- The console is your friend!!

CodePen

- If you work on your code on an online editor (e.g. CodePen) the software lets you separate HTML, CSS, and JavaScript without any links

Review

- JavaScript can appear in the head or body of your code
- Code can also be placed in an external js file
- Personally, development done in head and moved to external after testing

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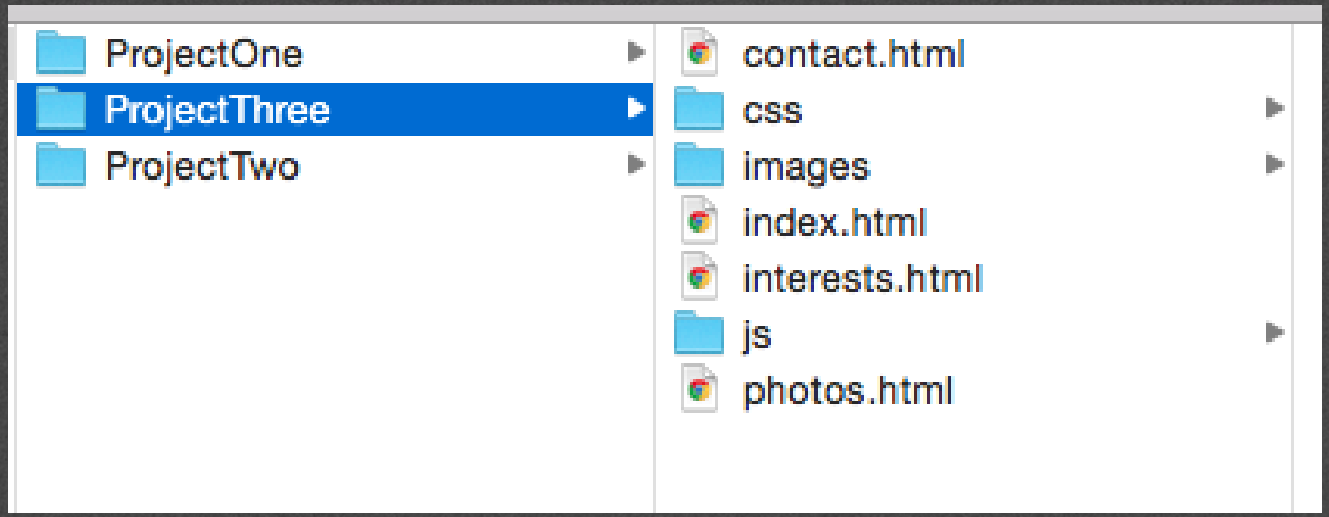
Folder Structure / Organizing Your Code

Folder Structure

- Web Developers tend to organize their code into separate parts
  - HTML
  - CSS
  - Images
  - JavaScript

Conventions

- Organizing your code is a convention, not a rule



Linking from an HTML file

```
<link rel = "stylesheet" href = "css/style.css">
<script src = "js/javaFunctions.js"></script>
<img src = "images/myPicture.jpg">
```

Linking from a CSS file

```
background: url("..images/holiday.png")
```

Debugging

- If a link isn't working you want to check a few things:
  - Did you spell the file names correctly? (Case matters!!)
  - Are files in the correct folder?
  - Are you working on the correct file?

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Events

Adding the Interactivity!!

- It has been up to us to decide when the functions should execute
- It would be better if the functions were called based on special "events"
- The JavaScript API lets us add dynamic function calls!!

Events

- onclick
  - User clicks on an HTML element
- onmouseover
  - User moves the mouse over an HTML element
- onresize
  - browser window is resized
- onload
  - browser finishes loading the page

How it works

- Any element can react to an event.
- You need to add the event to the tag and include what you want to happen

```
<div onclick = "message()"> Clicking on this Div
will invoke a JavaScript function</div>
```

Using Quotes

- You can use single quotes or double quotes for the event result
- Double quotes make it easier if you want to pass String parameters
- Be careful of copying and pasting quotes!

```
<div onclick = "message('Hi')">
```

Example

- Events – Basic Example
- Events – Basic Date Example

Events Change the Program Flow

- Some programs ran in a linear order (step-by-step)
- Events cause the program to "run continuously" since the DOM is always listening for events

More Events

- **Mouse Events**
  - onclick, ondblclick, onmousedown, onmouseenter, onmouseleave, on mousemove, onmouseout,….
- **Keyboard Events**
  - onkeydown, onkeypress, onkeyup
- **Frame Events**
  - onload, onresize, onscroll, onerror,…
- **Comprehensive list:**
  - https://developer.mozilla.org/en-US/docs/Web/Events

Review

- Without the events, JavaScript would be limited in ability to interact with the DOM
- Events are cool….they are also annoying
- Don't worry about memorizing the different events. As the need arises, look them up

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Code With Me: Events

Coding in JavaScript Takes Practice

- Watching these videos isn't enough
- Dive into the code!
- Modify the code!
- Break the code!

Examples

- Events – Modify the DOM
- Events – Change Style

Review

Stop and Code!

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"this"

Referring to Elements

- A key to smart programming is using functions
- A common roadblock is figuring out how to set up functions for reuse
    - How do I avoid writing a different function for every different element?
    - How can the function know which one I want to use?

"this"

- "this" is a keyword that allows an element to reference itself
  - Every object in the DOM has an automatically generated "this"
- Allows you to access an element's info
  - Without "this" it would be difficult for the functions to know what data to use
- "this" is also used outside functions

Examples

- "this" Example – Simple
- "this" Example - Complex

Review

- "this" is a tricky concept to grasp
- Repeated practice helps
- If you get stuck, work backward from where you see the keyword find the last element that was started

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Photo Gallery

Putting It into Practice

- Given the HTML code and the CSS code, can you:
  - change the background-image of an element?
  - change the content of an element?

Example

- Gallery Homework

background-image

- The background-image is an option for including graphics without using the img tag
- You should set a background-color as well in case the url isn't valid

```
background-image: url("mypPic.jpg")
background-color: #CCEECC;
```

Element text

- We have discussed two different ways to change the content
  - document.write()
  - innerHTML()

Tips

- The code should actually be quite short
- You will need to think about how to incorporate the quotes
- Remember, you use + to concatenate Strings

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