This is CS50

Section, Week 9

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Agenda

- Announcements
- Language Galore
- Javascript
- Objects
- DOM
- AJAX
- pset8 (last one woo!!)

Announcements

- Huge shoutout to Sam for teaching last week!
- Come get quizzes after section
- Quiz 1 next Wed/Thurs
  - Same format as Quiz 0, but focusing on material from Week 6 onwards
  - Q&A Monday 5:30pm
  - Review session in section next week
  - Q&A Office hours Mon/Tues

Resources

- Lecture notes + source code
- Section slides + source code
- cs50.yale.edu/shorts
- study.cs50.net
- cs50.net/discuss
- office hours
- Google
- Me!

C vs. PHP vs. HTML vs. CSS

- C: programming language
  - compiled and run
- HTML: markup language
  - structure and content
- CSS: style sheet language
  - look and feel
- PHP: server-side scripting language
  - functionality
  - only executed over the server

http://www.johnhaydon.com/whats-difference-between-css-html-php/

https://www.youtube.com/watch?v=N9qYF9DZPdw

Javascript

- Client-side scripting language
  - like PHP, is an interpreted language = no need to compile
  - like PHP, is loosely bound (`var`)
  - programs written in Javascript run in the web browser
- Javascript
  - program automatically fetched by browser
  - executed on computer
- PHP
  - program runs on web host's computer
  - sends result to visitor's browser, which displays the results

jQuery

Javascript library

```
// in index.html
<script src = "js/jquery.js"><script>
<script src = "js/scripts.js"><script>

// in index.js
$(document).ready(function(){
     // TODO
});
```

Hello World

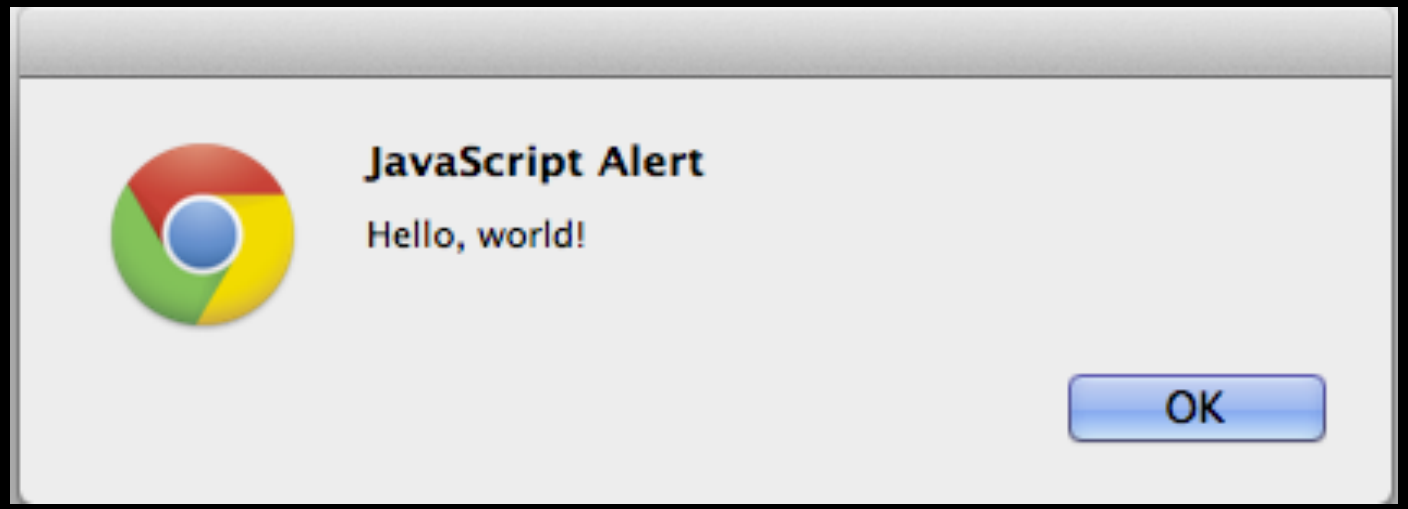
index.html:

```
<!DOCTYPE html>
       <html>
              <head>
                     <script type="text/javascript"
src="hello.js">
          </script>
                     <title>Hello, world!</title>
              </head>
              <body>
                     Body HTML here
              </body>
    </html>
```

hello.js:

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

Hello World



Variable Declarations

Loosely-typed

Global

```
x = 3.14;
x = "CS50";
x = true;
```

Local

```
var x = 3.14;
```

```
...

alert("Type of b: " + typeof(b));
b = "make b a string";
alert("Type of b: " + typeof(b));
```

Loops

```
for(/* init */; /* condition*/; /* update */)
{
   /* code */
}


while(/* condition */)
{
     /* code */
}

do {
   /* code */
} while(/* condition */);
```

Function Declarations

```
function sum(x, y)
{
      return x + y;
}

/* or */

var sum = function(x, y)
{
      return x + y;
}

var sum = sum(3, 5);
alert("3 + 5 = " + sum);
```

Arrays in JavaScript

```
var array = [];

var array2 = ["Arrays", "in", "JS"];
var thirdElement = arr2[2];

var arr2len = arr2.length;

var array3 = [2.3, true, 5];
array3[2] = "not a number";
array3[100] = "legit";
```

Objects

- Collections of data
- Similar to what other data types we've learned about?
- key: value access

- Two ways to access properties:
- 1. dot notation
- 2. square brackets

Objects in JavaScript (1)

```
object = complex data type

var fruit = {};

fruit["type"] = "strawberry";
fruit.color = "red";

alert(fruit.type);
alert(fruit["type"]);
```

Objects in JavaScript (2)

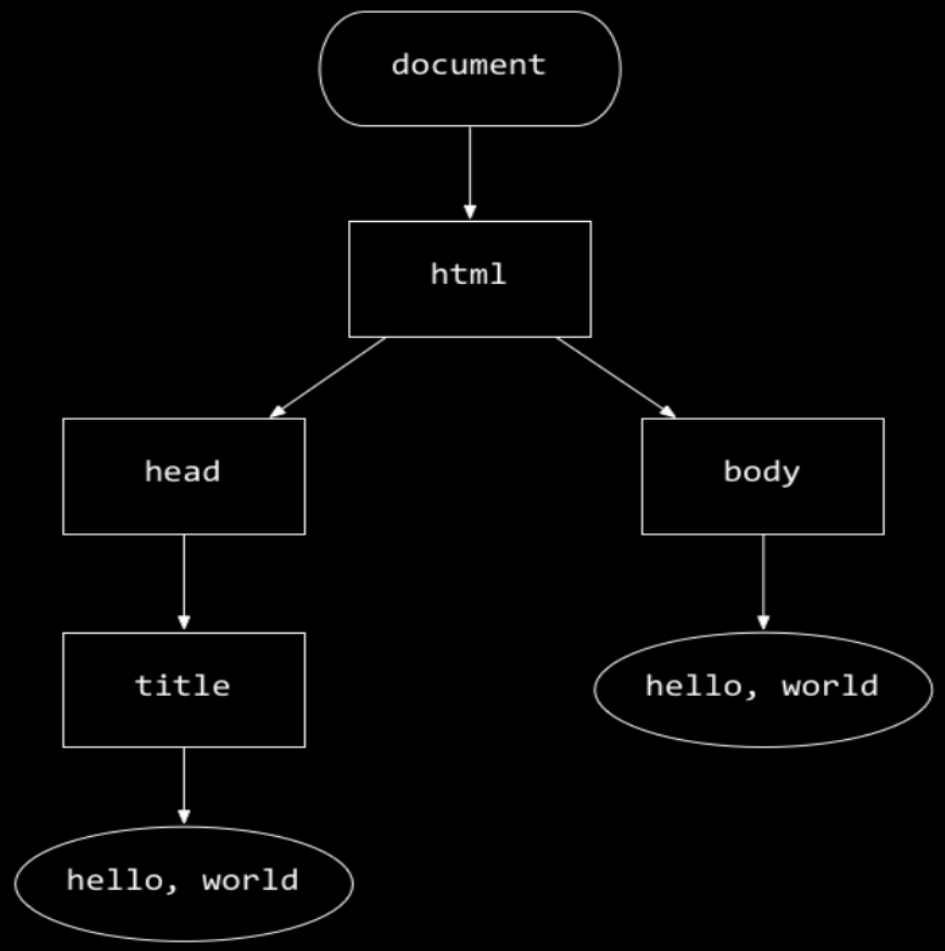
```
var fruit = {
     type: "strawberry",
     color: "red",
     size: 4;
     sweet: true;
     showType: function(){
     console.log("This is " + this.type);
     }
   };
```

Objects in JavaScript (3)

```
var heads = [
  {name: "Andi", college: "Berkeley"},
  {name: "Jason", college: "Silliman"},
  {name: "Scaz", college: "MIT"}
];

for(var i = 0; i < heads.length; i++)
{
    alert(heads[i].name);
}
```

DOM: Document-Object Model




```
<!DOCTYPE html>

<html>
      <head>
            <title>hello, world</title>
      </head>
      <body>
            hello, world
      </body>
</html>
```

DOM: Document-Object Model (2)

Examples

- `document.title`
- `document.body`
- `document.body.innerHTML`

Useful Functions

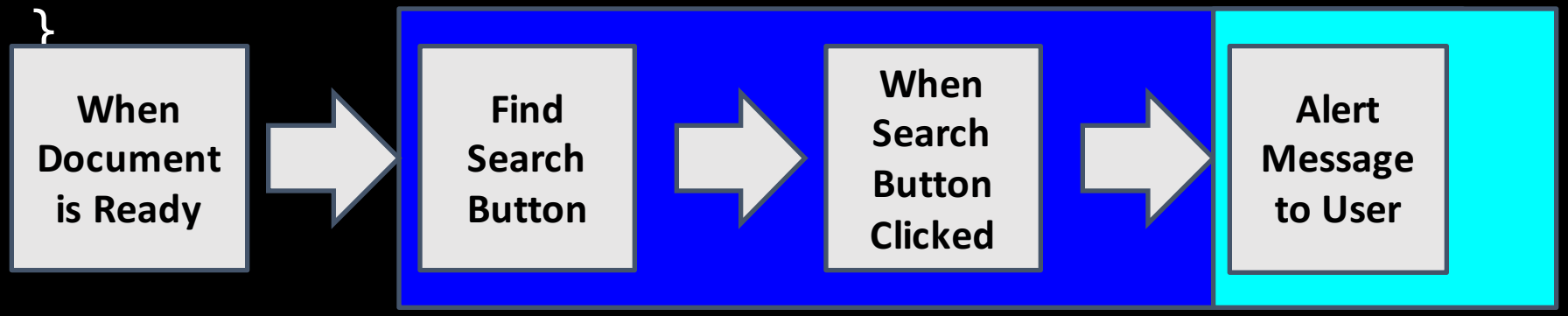
- `document.getElementById(`*`string`*`)`
- `document.getElementsByClassName(`*`string`*`)`
- `document.getElementsByTagName(`*`string`*`)`

JavaScript Events

```
window.onload = function() {

   var searchButton =
      document.getElementById("search_button");

   searchButton.onclick = function() {
            alert("You clicked the search
button");
   }
}
```

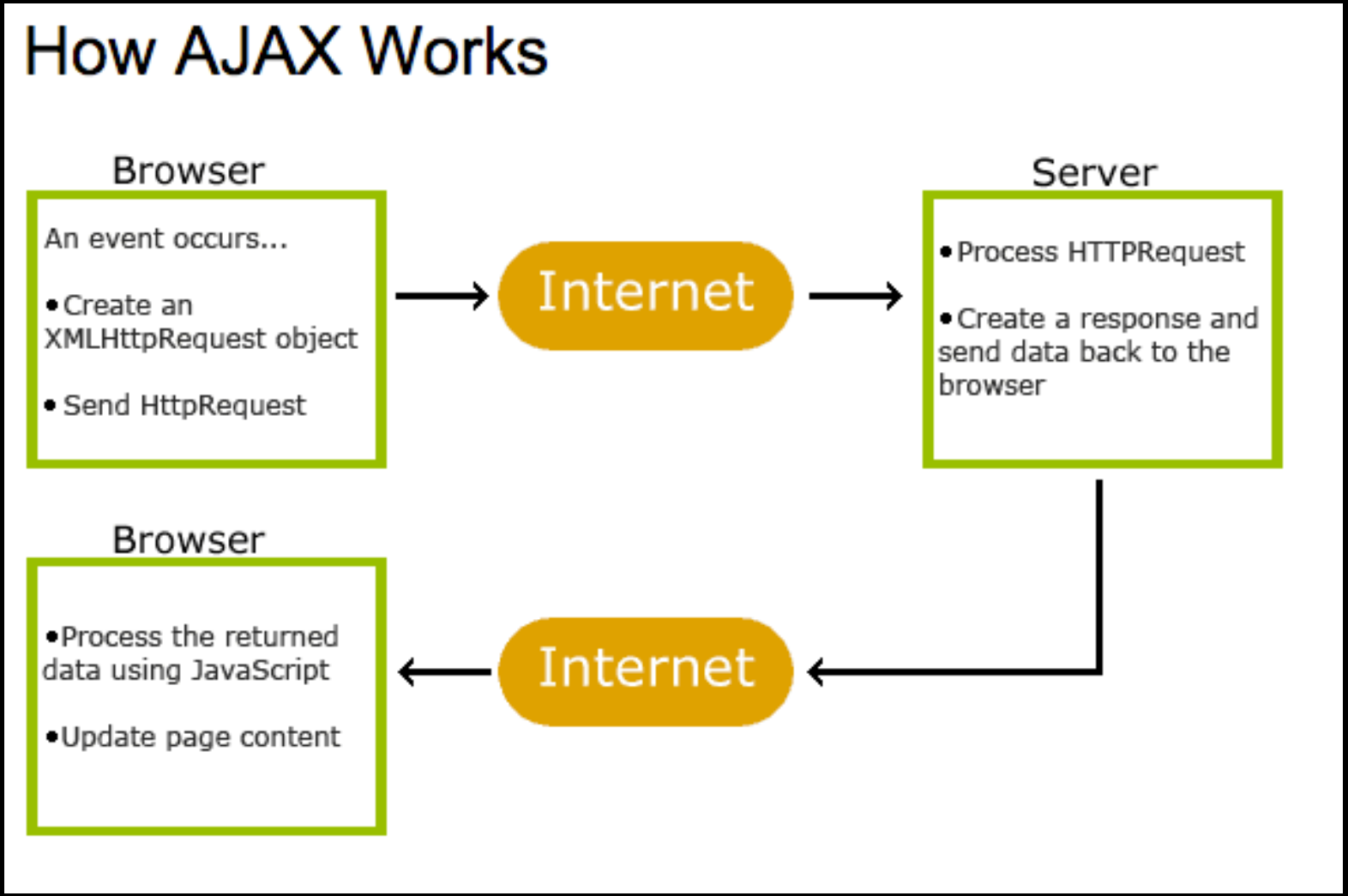


Challenges

In your pset8 spec:

1. Write a function `properties` that prints out the key-value pairs of the Javascript object `obj`
2. Change the background color of header to blue
3. Change the title of the pset to "I Made It Through CS50"

AJAX


How AJAX Works
Browser
An event occurs...
• Create an XMLHttpRequest object
• Send HttpRequest
Internet
Server
• Process HTTPRequest
• Create a response and send data back to the browser
Internet
Browser
• Process the returned data using JavaScript
• Update page content

Pset8: Mashup

- `import()`
- `addMarker()`
- `removeMarkers()`
- `search.php`
- `configure()`