Introduction to JavaScript

Learn how to program your computer!

0
You can and must understand computers NOW

"Everything is deeply intertwingled. In an important sense there are no "subjects" at all; there is only all knowledge, since the cross-connections among the myriad topics of this world simply cannot be divided up neatly."

—Ted Nelson, *Computer Lib/Dream Machines*

"When human beings acquired language, we learned not just how to listen but how to speak. When we gained literacy, we learned not just how to read but how to write. And as we move into an increasingly digital reality, we must learn not just how to use programs but how to make them."

—Douglas Rushkoff, *Program or Be Programmed*

"The single most significant change in the politics of cyberspace is the coming of age of this simple idea: The code is law. The architectures of cyberspace are as important as the law in defining and defeating the liberties of the Net."

—Lawrence Lessig, *The Code Is the Law*

1
Learning a new language

Code is text

Programming is typing

Programming is very careful typing

Programming is fast typing

Programming is figuring out why it broke

Programming in general

- A series of text files that get compiled and executed
- Code is "digested," going from human-readable to a hardware-ready form
- Ultimately programs run as assembly, low-level instructions for your CPU

JavaScript in particular

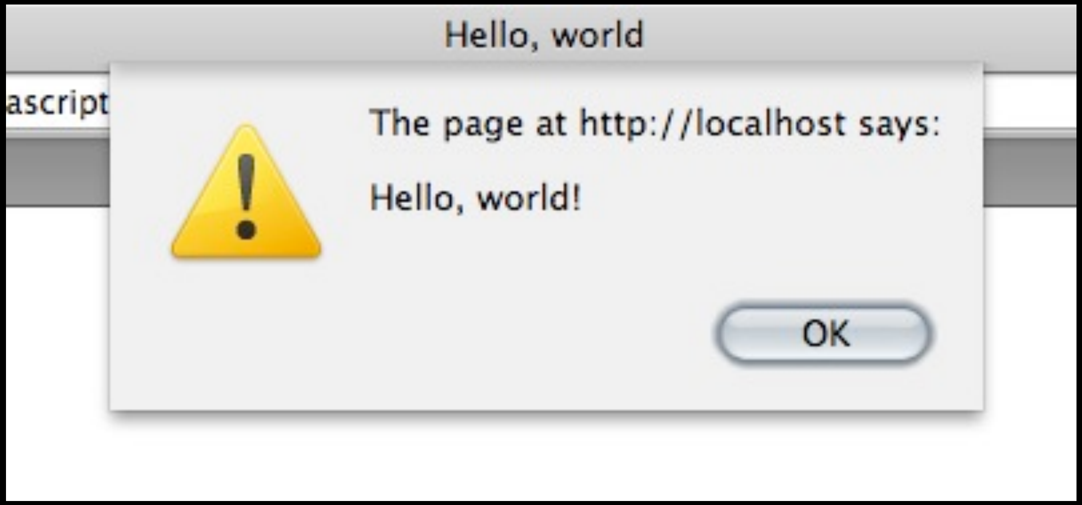
- Increasingly *the* web page scripting language
- Most likely the widest deployed runtime
- JavaScript has nothing to do with Java, except some syntax similarities

Lines of code

- A line of code is a basic unit of programming
- Tells the computer to do something
- Sometimes a “line” of code can span more than one line

A simple line of code

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


Hello, world

ascript

The page at http://localhost says:

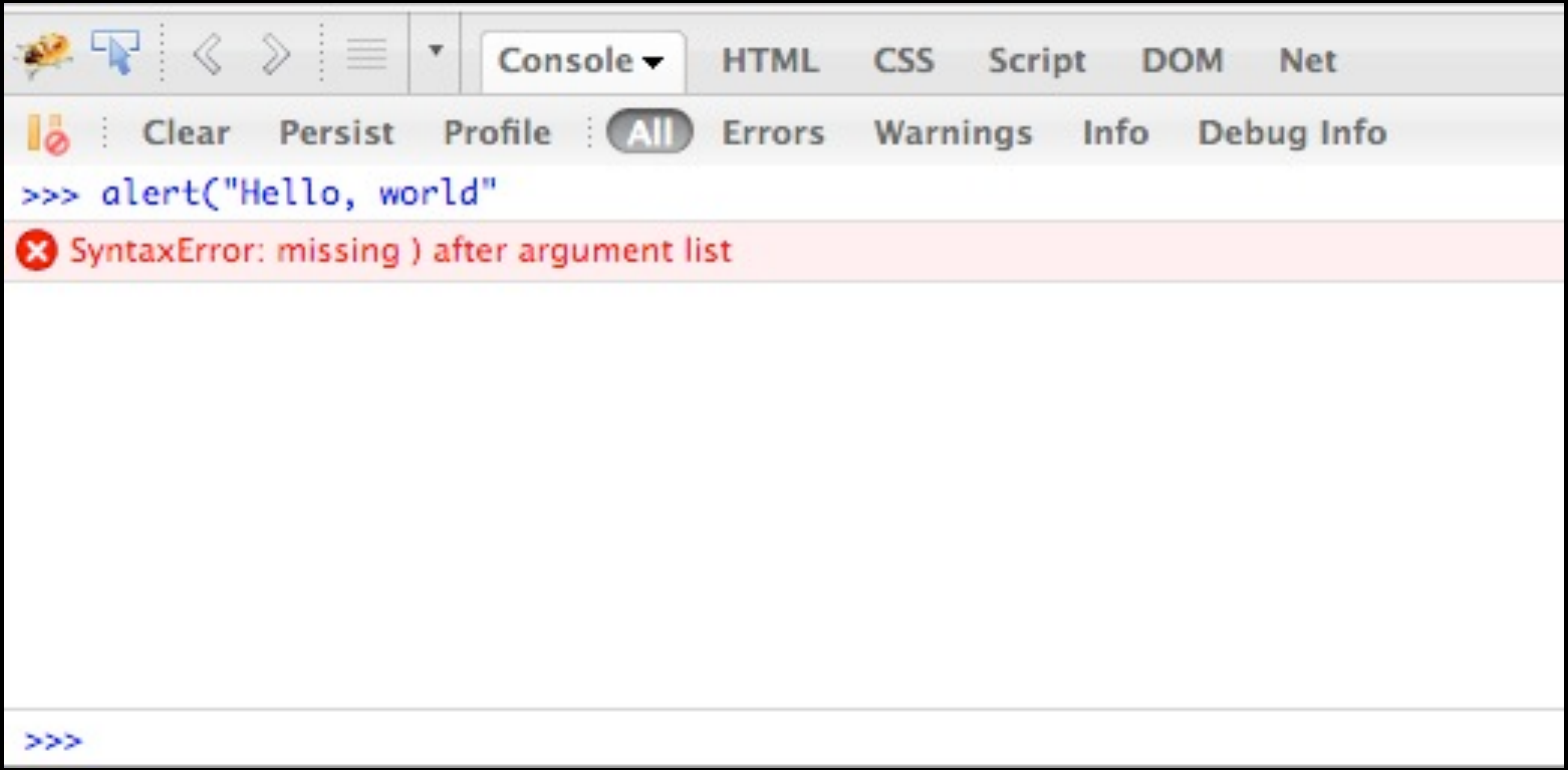
Hello, world!

Let’s try this using <u>Firebug</u>

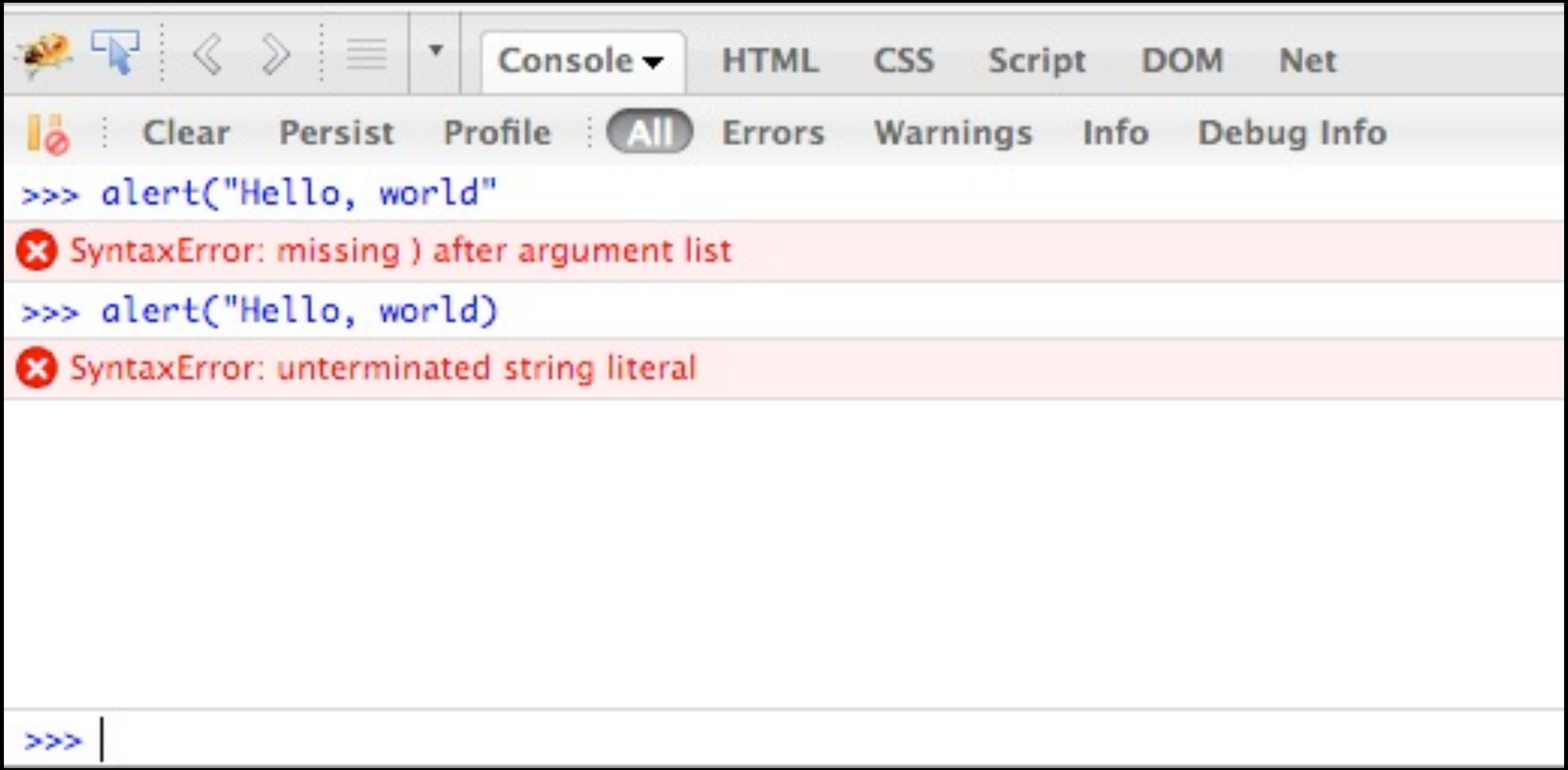
2
Writing code

Compilers are unforgiving

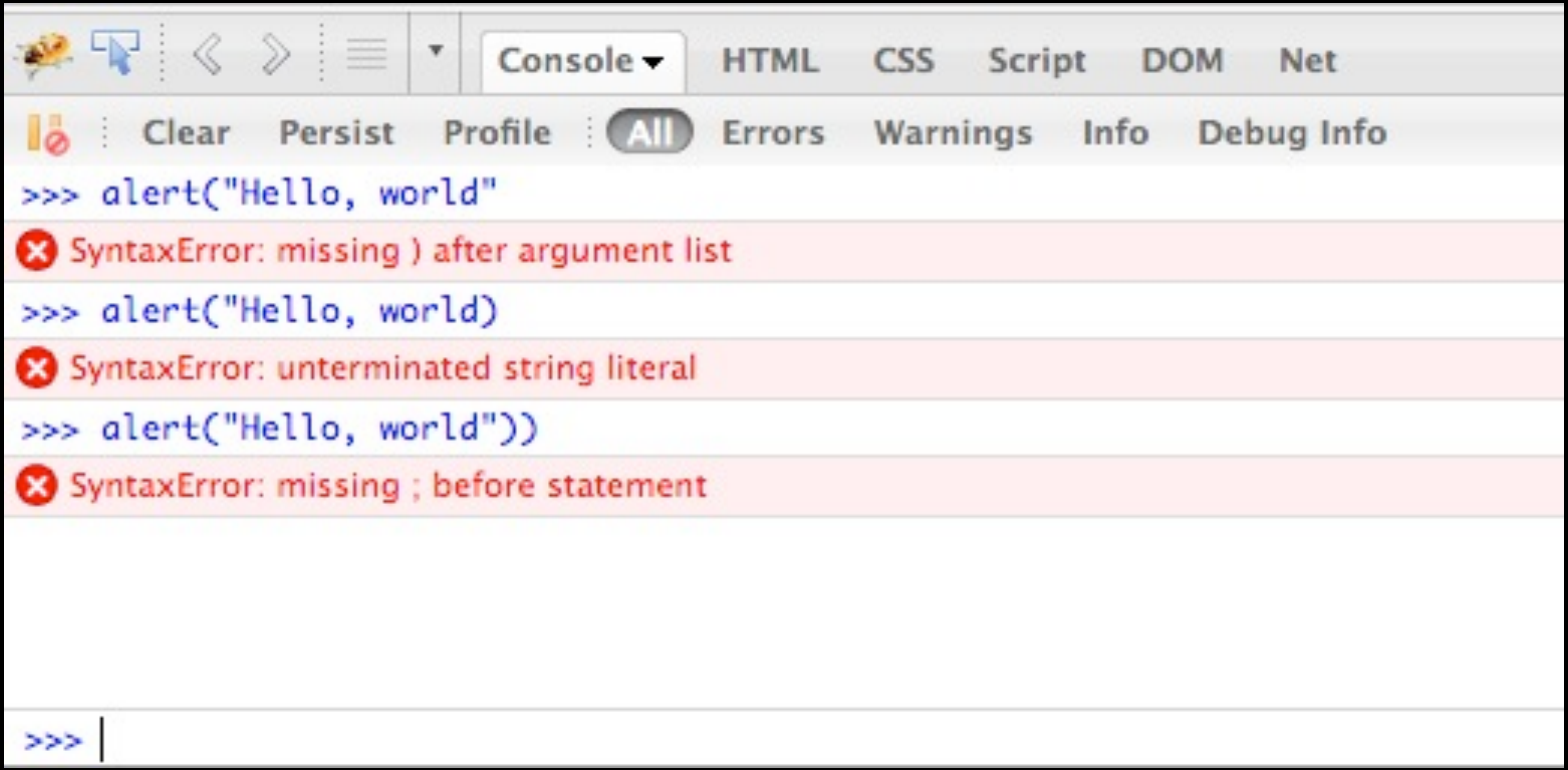
- The computer cuts you no slack
- All code is subject to bugs
- The error console is your friend
- Debugging is about identifying, characterizing, and resolving problems



```
>>> alert("Hello, world"
SyntaxError: missing ) after argument list
>>>
```



```
>>> alert("Hello, world"
SyntaxError: missing ) after argument list
>>> alert("Hello, world)
SyntaxError: unterminated string literal
>>>
```



```
>>> alert("Hello, world"
SyntaxError: missing ) after argument list
>>> alert("Hello, world)
SyntaxError: unterminated string literal
>>> alert("Hello, world"))
SyntaxError: missing ; before statement
>>>
```

A simple line of code

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

$\uparrow$

Function name

A simple line of code

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

Function name *Parentheses call the function*

A simple line of code

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

Function name *Parentheses call the function*

Function argument (a string)

A simple line of code

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

Function name

Parentheses call the function

Function argument (a string)

Designates the end of the line

3
Variables

The variable metaphor

“Variables are like a box you can put data into.”

The variable metaphor

The variable metaphor

Variables

- Variables store data for future use
- *var x = y;* is how you assign a new variable in JavaScript
- We can now refer to x in future lines of code, and know it means y

Variables (boolean type)

- Variables store data for future use
- *var x = true;* is how you assign a new variable in JavaScript
- We can now refer to x in future lines of code, and know it means true

Variables (boolean type)

- Variables store data for future use
- *var x = false;* is how you assign a new variable in JavaScript
- We can now refer to x in future lines of code, and know it means false

Variables (numeric type)

- Variables store data for future use
- *var x = 47;* is how you assign a new variable in JavaScript
- We can now refer to x in future lines of code, and know it means 47

Variables (string type)

- Variables store data for future use
- *var x = "pony";* is how you assign a new variable in JavaScript
- We can now refer to x in future lines of code, and know it means pony.

Variable logic

```
// What is the value of z?
var x = 3;
var y = x + 1;
var z = y;
```

4
Functions

Multiple lines of code

```
var msg = "Hello, world!";
var func = alert;
func(msg);
```

Designate the ends of the lines

Multiple lines of code

```
var msg = "Hello, world!";
var func = alert;
func(msg);
```

The first line stores a string

Multiple lines of code

```
var msg = "Hello, world!";
var func = alert;
func(msg);
```

The second line stores a function

Multiple lines of code

```
var msg = "Hello, world!";
var func = alert;
func(msg);
```

The third line executes the stored function with the string

Commenting code

```
// First we store the message
var msg = "Hello, world!";

// Next, we choose a function to call
var func = alert;

// Finally, we combine the two
func(msg);
```

Commenting code

```
/*

This code demonstrates the standard
Hello World program, over three lines
instead of just one.

*/
var msg = "Hello, world!";
var func = alert;
func(msg);
```

Creating a new function

```
// Outputs a simple message
function output_message() {
  var msg = "Hello, world!";
  var func = alert;
  func(msg);
}
```

Calling our function

```
// Outputs a simple message
function output_message() {
  var msg = "Hello, world!";
  var func = alert;
  func(msg);
}

output_message();
```

Arguments

```
// Outputs a simple message
function output_message(msg) {
  var func = alert;
  func(msg);
}

output_message("Hello, world!");
output_message("¡Hola, mundo!");
```

5
Libraries

JavaScript on the web

```
<script>

// JavaScript code is typically embedded in HTML
// <script> tags

</script>
```

HTML + JavaScript

```
<html>
  <head>
    <title>HTML + JavaScript</title>
  </head>
  <body>
    <p>Stuff *on* the page goes up here.</p>
    <script>

    // JavaScript code that modifies the page should
    // go below everything else in the <body>.

    </script>
  </body>
</html>
```

Hide content

```
<html>
  <head>
    <title>Hide content</title>
  </head>
  <body>
    <p id="hide">Click to hide me!</p>
    <script src="mootools.js"></script>
    <script>
    $('hide').addEvent('click', function() {
      $('hide').fade('out');
    });
    </script>
  </body>
</html>
```

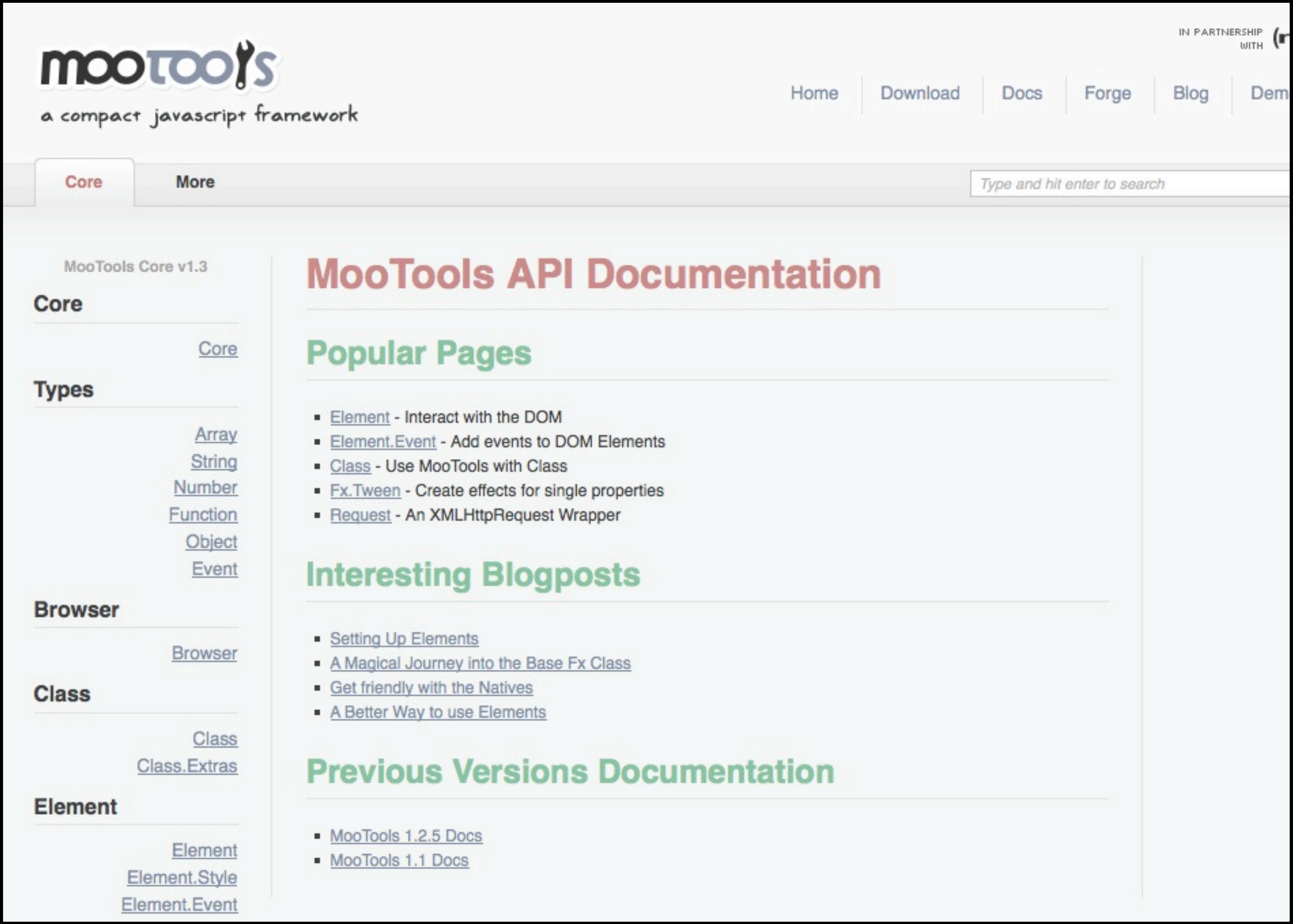
HTML + CSS + JavaScript

```html
<html>
  <head>
    <title>HTML + CSS + JavaScript</title>
    <style>
    #content {
      background: #000;
    }
    </style>
  </head>
  <body>
    <p id="content">Hello, world!</p>
    <script>
      var content = document.getElementById('content');
      content.style.color = '#fff';
    </script>
  </body>
</html>
```

HTML + CSS + JavaScript

```
<html>
  <head>
    <title>HTML + CSS + JavaScript</title>
    <link rel="stylesheet" href="styles.css" />
  </head>
  <body>
    <p>
      Separating code into .js and .css files is a
      good way to keep things tidy.
    </p>
    <script src="scripts.js"></script>
  </body>
</html>
```

6
Slide show



MooTools Core v1.3

Core

Core

Types

Array
String
Number
Function
Object
Event

Browser

Browser

Class

Class
Class.Extras

Element

Element
Element.Style
Element.Event

MooTools API Documentation

Popular Pages

- Element - Interact with the DOM
- Element.Event - Add events to DOM Elements
- Class - Use MooTools with Class
- Fx.Tween - Create effects for single properties
- Request - An XMLHttpRequest Wrapper

Interesting Blogposts

- Setting Up Elements
- A Magical Journey into the Base Fx Class
- Get friendly with the Natives
- A Better Way to use Elements

Previous Versions Documentation

- MooTools 1.2.5 Docs
- MooTools 1.1 Docs

Slide show HTML

```
<html>
  <head>
    <title>Slide show</title>
    <link rel="stylesheet" href="styles.css" />
  </head>
  <body>
    <div id="slides">
      <div id="inner">
        <img src="images/1.jpg" />
        <img src="images/2.jpg" />
        <img src="images/3.jpg" />
        <img src="images/4.jpg" />
      </div>
    </div>
    <script src="mootools.js"></script>
    <script src="script.js"></script>
  </body>
</html>
```

Slide show CSS

```
#slides {
  width: 991px;
  height: 671px;
  margin: 0 auto;
  overflow: hidden;
  position: relative;
}

#inner {
  position: absolute;
  left: 0;
  top: 0;
}

#slides img {
  float: left;
}
```

Slide show JavaScript

```
var width = 991;
var n = 0;
var count = $$('#slides img').length;

$('slides').addEvent('click', function() {
  n = (n + 1) % count; // Increment
  $('inner').tween('left', n * -width);
});
```

7
What next?

Come up with a project

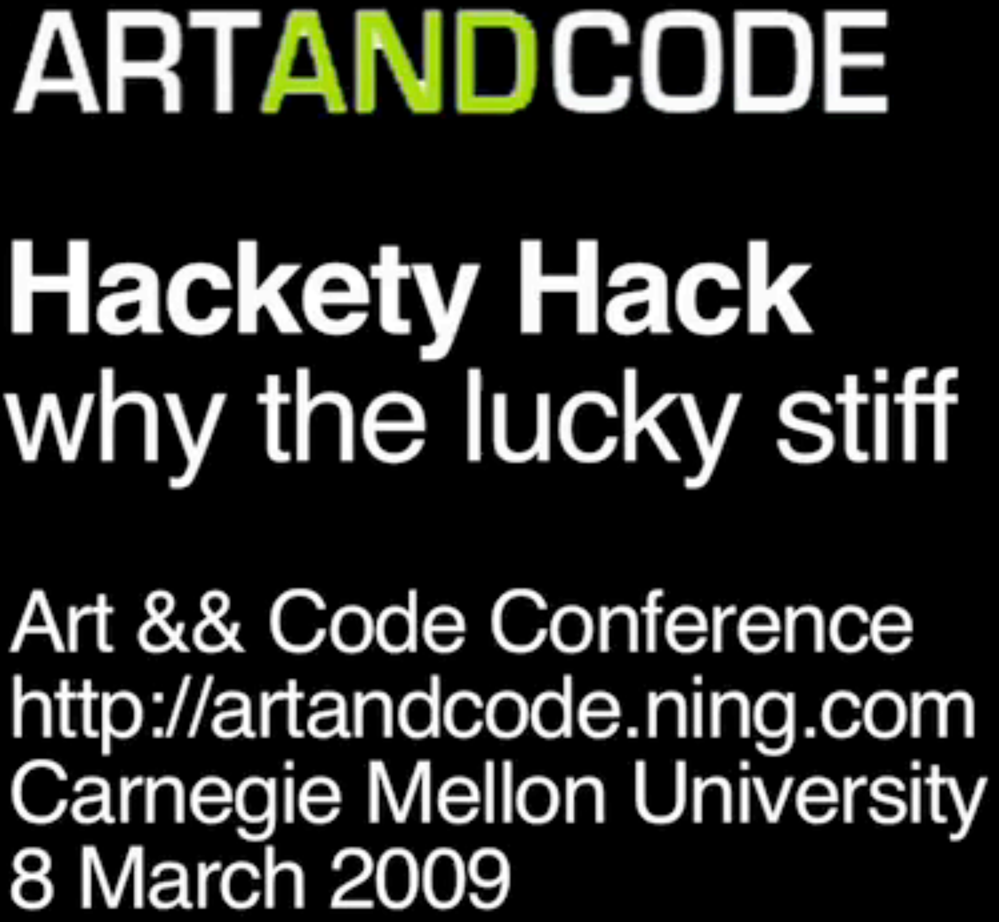
Try to build it yourself

Take your time, it won’t come quickly

Resources

- Eloquent JavaScript
- MooTorial
- w3schools.com
- Mozilla devmo
- WebMonkey
- The Rhino Book
- _why's poignant guide to Ruby
- Dive into Python
- Visual Quickstart Guide
- Lynda tutorials

http://www.vimeo.com/5047563



ARTANDCODE

Hackety Hack
why the lucky stiff

Art && Code Conference
http://artandcode.ning.com
Carnegie Mellon University
8 March 2009

http://www.vimeo.com/5047563