Overview of JavaScript

Overview

- What is JavaScript?
- History
- Uses of JavaScript
- Location of Code
- Simple Alert Example
- Events
- Events Example
- Color Example
What is JavaScript?

- Language used for adding dynamism to Web pages.
- Loosely typed: Variables not typed.
- Object-based: Limited support for inheritance.
- Interpreted: Interpreter built into browsers.
- Modeled after C++.
  - Similar syntax

What is JavaScript? (cont.)

JavaScript can:
- Put dynamic text into an HTML page.
- React to events.
  - E.g. when a user clicks on an HTML element
- Read and write HTML elements.
- Be used to validate data.
  - Saves network traffic and server-side processing
History

- JavaScript created in 1995 by Brendan Eich of Netscape.
- First used in Netscape 2.0.
- Originally called “LiveScript.”
- Changed to “JavaScript” to ride popularity of Java.
  - Based on JavaScript 1.1

<table>
<thead>
<tr>
<th>JS Ver.</th>
<th>ECMAS Version</th>
<th>NN</th>
<th>IE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td></td>
<td>2.0x</td>
<td>3.0x</td>
</tr>
<tr>
<td>1.1</td>
<td>Version 1</td>
<td>3.0x</td>
<td>3.02x</td>
</tr>
<tr>
<td>1.2</td>
<td>Not compat.</td>
<td>4.0x-4.05</td>
<td>4.0x</td>
</tr>
<tr>
<td>1.3</td>
<td>Version 2</td>
<td>4.07-4.7x</td>
<td>5.0x-5.1x</td>
</tr>
<tr>
<td>1.4</td>
<td>Version 3</td>
<td>5.0</td>
<td>5.5x</td>
</tr>
<tr>
<td>1.5</td>
<td>Version 4</td>
<td>6.0x-7.0x</td>
<td>6.0x</td>
</tr>
</tbody>
</table>
History (cont.)

- JavaScript 2.0 is in the works.
  - www.mozilla.org
  - Under development as of spring 2004
- Closely matches the ECMAScript Edition 4 standard.

http://www.ecma-international.org

Uses of JavaScript

- Dynamism takes three forms:
  1. **Events:** Allows you to monitor events and change positioning or content based on events.
  2. **Dynamic positioning:** Can tell the browser where to place content without using tables.
  3. **Dynamic content:** Allows dynamic updating of data at specified time intervals.
Location of Code

- JavaScript may be three places:
  1. In the `<head>` element.
     - Place scripts to be called or when event is triggered here
     - Ensures script is loaded before called

```html
<html>
<head>
  <script type="text/javascript">
  script statements
  </script>
</head>
</html>
```

Location of Code (cont.)

2. In the `<body>` element.
   - Place scripts to be executed when the page loads here
   - Script generates some or all of the content of the page

```html
<body>
  <script type="text/javascript">
  script statements
  </script>
</body>
```
3. **External to the HTML file.**
   - Maximizes reuse across pages

   ```html
   <head>
     <script src="myfile.js">
     </script>
   </head>
   ```

   - Script could be in `<head>` or `<body>`.
   - External script should **not** contain `<script>` tag.

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**Simple Alert Example**

- Try the example at:
  [http://www.rh.edu/~heidic/webtech/examples/JavaScript/simple.html](http://www.rh.edu/~heidic/webtech/examples/JavaScript/simple.html)

**Simple JavaScript Example using Alert**

Click on the button

[button] greetings
Simple Alert Example (cont.)

```html
<html>  <head>
  <title> Simple JavaScript alert button example. </title>
  <script language="JavaScript" type="text/javascript">
    function mywelcome () {
      alert("Welcome to Heidi Ellis' simple JavaScript page.");
    }
  </script>
</head>
<body>
<h1>Simple JavaScript Example using Alert. </h1>
<script>
  document.writeln("Click on the button.");
</script>
</body>
</html>
```
Simple Alert Example (cont.)

```html
<form>
<input type="button"
    name="welcome"
    value="greetings"
    onClick="mywelcome()">
</form>
</body>
</html>
```

Events

- One of the primary uses of JavaScript is to make Web pages interactive.
  - Responsive to user actions
- JavaScript provides event handlers.
  - Execute segment of code based on events occurring within the application
    - E.g., `onLoad` or `onClick`
- Handlers associated with elements.
- Not all elements support all event handlers.
Events (cont.)

```html
<input type="button" name="clickme" value="Click Here" onClick="window.status='Thanks'; return true;"/>
```

Events (cont.)

- Event handlers can be categorized into interactive and non-interactive.
- Interactive: Depends on a user action.
  - E.g., `onClick`
- Non-interactive: Non-user event.
  - E.g., `onLoad`
Events (cont.)

- `onAbort`: Image loading is interrupted.
- `onBlur`: Element loses input focus.
- `onChange`: User selects or deselects item.
- `onClick`: User clicks once.
- `onDragDrop`:
- `onError`: Image doesn’t load properly.

Events (cont.)

- `onFocus`: Element is given input focus.
- `onKeyPress`:
- `onKeyUp`:
- `onLoad`:
- `onMouseDown`:
- `onMouseOver`:
- `onMouseOut`:
- `onMouseUp`:
Events
(cont.)

- **onMove**: User or JavaScript moves window.
- **onReset**: User clicks reset button.
- **onResize**: User resizes window.
- **onSelect**: User selects text in text or `textarea`.
- **onSubmit**: User clicks submit button.
- **onUnload**: User exits document.
- **Gatescript has event reference page**:
  
  [http://www.gatescript.com/events.html](http://www.gatescript.com/events.html)

Events
Supporting Events

1. **Give the target HTML element a name attribute.**

   ```html
   <input type="text" name="price" />
   ```

2. **Give activating HTML element event attribute that calls function.**

   ```html
   <input type="submit" value="Calculate total." onClick="calcTotal()"/>
   ```
Events
Supporting Events

3. Write the JavaScript function to modify the DOM element with the name attribute.

- Try the “Event page” JavaScript example:
  http://www.rh.edu/~heidic/webtech/examples/JavaScript/events.html

Events Example

Simple Example to Show the use of Events
Enter a price ...
Price of item: 10
Quantity purchased: 12
The total is: 120
<html>
<head>
<title>JavaScript Test</title>
<script language="JavaScript" type="text/javascript">

function calcTotal()
{
    tot = document.totalForm.price.value *
         document.totalForm.qty.value;
    document.totalForm.total.value
        = tot;
}
</script>

</head>
</html>
Simple Example to Show the use of Events

Enter a price and move cursor out of box. The new total will be calculated automatically.
Events Example (cont.)

```html
<input type="text"
    name="qty"
    onMouseout="calcTotal()" />
<br>  <br>
The total is:
<input type="text"
    name="total" />
<br>
</form>
</body>
</html>
```
Color Example

- Try the “Color example” JavaScript:
  http://www.rh.edu/~heidic/webtech/examples/JavaScript/prop.html

```html
<html>
<head>
<title> Simple JavaScript document properties example. </title>
</head>
<body bgcolor="white">
<script language="JavaScript" type="text/javascript">
    document.bgColor="red";
    alert("Press button for another color");
    document.bgColor="blue";
    alert("Press button for another color");
</script>
</body>
</html>
```

Color Example (cont.)

```html
<body bgcolor="white">
<script language="JavaScript" type="text/javascript">
    document.bgColor="red";
    alert("Press button for another color");
    document.bgColor="blue";
    alert("Press button for another color");
</script>
```
Color Example (cont.)

document.bgColor="cyan";
alert("Press button for another color");
document.bgColor="indigo";
alert("Press button for a different title");
document.title="New Document Title";
</script>

Color Example (cont.)

<center>
  <h1> Color Play!! </h1>
</center>
Workshop 1

- Create a small Web page that prompts the user to enter their name.
- Write a JavaScript function that pops up an alert when the user has entered their name.
- Advanced: Display the user’s name in the alert.