

JavaScript Programming Concepts

Variables, Functions and the DOM

JavaScript Variables

Variables

- A variable is a placeholder for information.
- The variable is stored in the computer's memory (RAM).

- `var userName;`

← declaration

- `userName = "Karen";`

← assignment

- `document.write(userName);`

← Call to the write() method,
passing the variable as the argument

Variable Naming Rules

- The name must start with a letter, the underscore, or a dollar sign
- The rest of the name can contain any combination of letters, underscores, and numbers
- No spaces, punctuation or other characters
- Cannot use a reserved JavaScript word
- Names are case-sensitive

JavaScript Functions

Function

- A function is a block of one or more JavaScript statements with a specific purpose, which can be run when needed.

```
function function_name() {  
    ... JavaScript statements ...  
}
```

Note: the function body is placed between curly braces { }

Using Functions

JavaScript...

```
<script>
function getPrice() {
    var price;
    price = prompt("Enter the price");
    price = price * 1;
    alert("You entered $ " + price.toFixed(2) );
}
</script>
```

HTML...

```
<button onclick="getPrice()">Price</button>
```

The Document Object Model (DOM)

The "Document" "Object" "Model"

- Document

The file and all its content

- Object

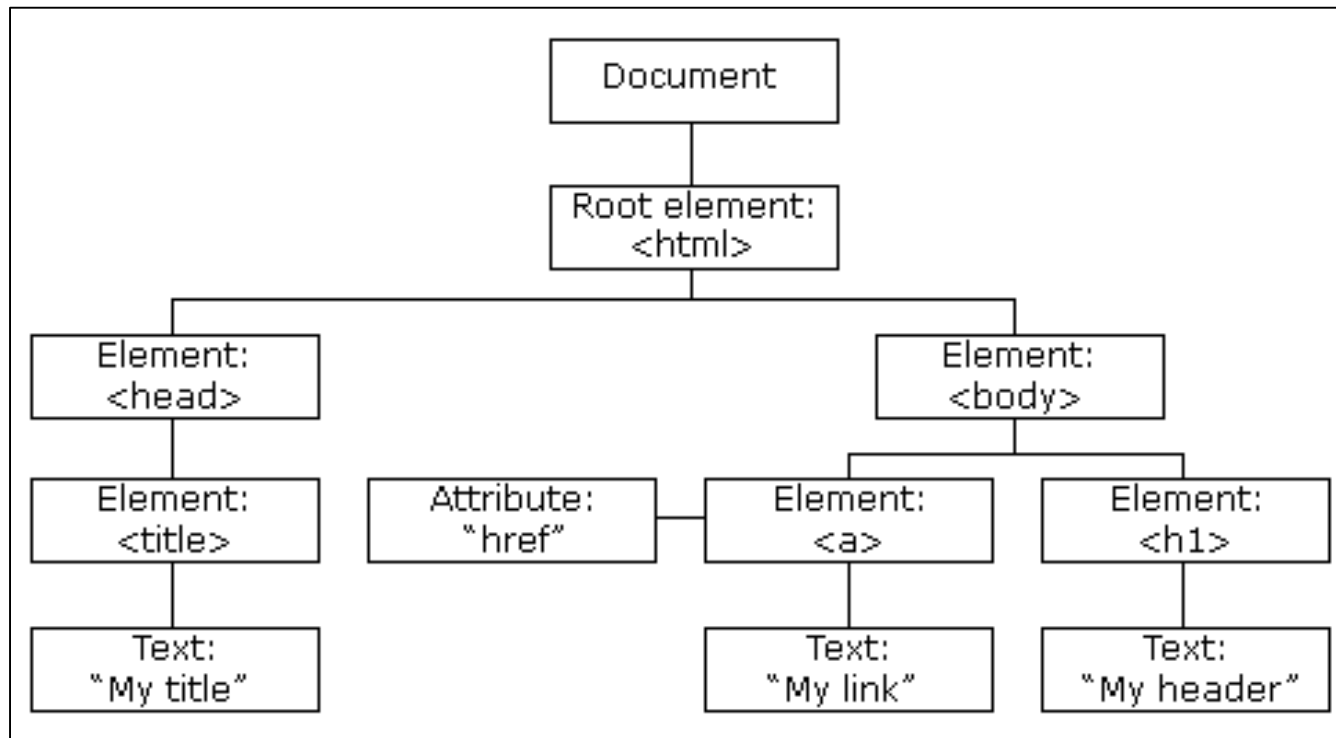
All the things in the document and their "handles"

- Model

A way to depict the document and all its objects

The HTML DOM Node Tree

The HTML DOM views HTML documents as tree structures. The structure is called a **Node Tree**:



With the HTML DOM, all nodes in the tree can be accessed by JavaScript. All HTML elements (nodes) can be modified, and nodes can be created or deleted.

DOM Nodes

- According to the W3C HTML DOM standard, everything in an HTML document is a node:
 - The entire document is a document node
 - Every HTML element is an element node
 - The text inside HTML elements are text nodes
 - Every HTML attribute is an attribute node
 - Comments are comment nodes

Definition

- *"The W3C Document Object Model (DOM) is a platform and language-neutral interface that allows programs and scripts to dynamically access and update the content, structure, and style of a document."*
- The Document Object Model is a W3C standard.
- The DOM defines a standard for accessing HTML and XML documents:
- The W3C DOM standard is separated into 3 different parts:
 - Core DOM - standard model for any structured document
 - XML DOM - standard model for XML documents
 - **HTML DOM - standard model for HTML documents**

Node Parents, Children, and Siblings

- The nodes in the node tree have a hierarchical relationship to each other.
- The terms parent, child, and sibling are used to describe the relationships. Parent nodes have children. Children on the same level are called siblings (brothers or sisters).
- In a node tree, the top node is called the root
- Every node has exactly one parent, except the root (which has no parent)
- A node can have any number of children
- Siblings are nodes with the same parent

JavaScript and the DOM

- The HTML DOM can be accessed with JavaScript (and other programming languages).
- All HTML elements are defined as **objects**, and the programming interface is the object **methods** and object **properties** .
- A **method** is an action you can do (like add or modify an element).
- A **property** is a value that you can get or set (like the name or content of a node).

Objects have Properties

- A property is a characteristic or attribute of the object.
- *DOT NOTATION: object.property*
 - The URL of a web page document
document.URL
 - The title of a web page document
document.title
 - The date the web page file was last modified
document.lastModified
 - The src file of an image object
image1.src

Remember: JavaScript is case sensitive!

Accessing and Displaying document properties

```
<script>
```

```
document.write("This page was last modified: "  
    document.lastModified);
```

+

concatenate symbol

```
</script>
```

```
<script>
```

```
document.write("The title of this page is: ");  
document.write(document.title);
```

```
</script>
```


Method

- A method is an action the object can do or respond to:
- Writing text to a web page document:
 `document.write()`
- Submitting a form:
 `form1.submit()`

.getElementById() method

- The .getElementById() method returns the element with the specified ID.
- Example:

```
var e = document.getElementById("intro");
```

Note: developers commonly use “e” as a variable name to represent an element.

Other methods

- `getAttribute()`
 - Returns the specified attribute value
 - Syntax:
`var = element.getAttribute(attributename)`
- `setAttribute()`
 - Sets or changes the specified attribute, to the specified value
 - *Syntax:*
`element.setAttribute(attributename,attributevalue)`