HTML, DOM & Events

Lesson Objectives

- Read and write simple HTML5 document.
- Learn to validate HTML document
- Basics of DOM and event handling

Hypertext Markup Language (HTML)

- It's a markup language (not really a programming language) used to demarcate sections of a web page.
- HTML5 is the latest version of the language

Structure of an HTML5 page

- The **`header`** describes the page and the **`body`** contains the page's contents
  - An HTML page is saved into a file ending with extension **`.html`**
- **`DOCTYPE`** tag tells browser to interpret our page's code as HTML5.
- HTML is case insensitive, but we follow conventions.

```
<!DOCTYPE html>
<html lang="en">
    <head>
        <meta charset="utf-8" />
        <title></title>
    </head>
    <body>
        page contents
    </body>
</html>
```

HTML Elements

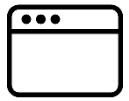
- HTML element is composed of opening tag, optional text, and closing tag.
  - Syntax: **`<element>`**content **`</element>`**
  - Example: **`<p>`**This is a paragraph**`</p>`**

- Most whitespace is insignificant in HTML (ignored or collapsed to a single space)

Headings: <h1>, <h2>, . . . , <h6>

Headings to separate major areas of the page (block)


```
<h1>Maharishi University</h1>
<h2>Department of Computer Science</h2>
<h3>CS301</h3>
```



Maharishi University

Department of Computer Science

CS301

More headings examples

Paragraph: <p>

Paragraphs of text (block)


```
<p>Lorem ipsum dolor sit amet, consectetur
adipiscing elit. Nam enim nisl, adipiscing quis
ultrices a, egestas quis lorem. Pellentesque
ultrices nunc id mauris posuere pulvinar.</p>
```

- Placed within the body of the page

More paragraph examples

Exercise

- Write a HTML page with your full name inside <h1> tag followed by a short paragraph about yourself.

Form input elements

Tag	Purpose
`<input type="text">`	Make a text field (single row)
`<input type="button" value="Click Me">`	Makes a button that user can click with label "Click Me"
`<button>Click Me</button>`	Makes a button that user can click with label "Click Me"
`<textarea></textarea>`	Makes text area (multiple row)

Exercise

- Quickly add a textbox, a textarea and a button to your html page.

Block vs Inline elements

- A block-level element always starts on a new line and takes up the full width available (stretches out to the left and right as far as it can). e.g. <p>, <h1>
- An inline element does not start on a new line and only takes up as much width as necessary. e.g. <input>, <textarea>
  - Need to use line break **
** to move to the new line.

Exercise

- User `<br>` tag to fix spacing between the elements.

Generic elements

- `<div>` - Generic block element
- `<span>` - Generic inline element

Comments: <!-- -->

- Comments to document your HTML file or "comment out" text
- Many web pages are not thoroughly commented (or at all)
- Useful at the top of page and for disabling code


```
<!-- My web page, by Suzy Student CSE 190 D, Spring 2048 -->
<p>CSE courses are <!-- NOT --> a lot of fun!</p>
```

W3C HTML Validator

- Checks your HTML code to make sure it follows the official HTML syntax
- Pickier than the browser

- https://validator.w3.org/

Main points

- HTML is a very simple language, once you know the content and organization of your document, you simply use the right set of tags to demarcate content you want to display in browsers. *Science of Consciousness*, *Transcendental Meditation is a very simple meditation technique, you simply take the correct angle and let go*.
- It's important to make sure html documents are well formed. *Science of Consciousness, Checking the syntactic structure of a document catches unintended errors. Regular TM checking gives the experience of effortless thought and prevents unintended effort during TM*.

`<script>` element

- The `<script>` element is used to embed JavaScript codes.
- It can go anywhere in the HTML page, but by convention it is placed in the head section.

Running a JavaScript program

- The computer (browser) runs or executes JavaScript code when certain events happen.
  - When HTML document is loaded in a browser.
  - When user clicks a button
  - When user types in a textbox
  - and more…

HTML Event Attributes

```
<button onclick = "doSomething()">Do it</button>


<script>
     function doSomething(){
          // code to do something.
     }
</script>
```

Example 1

- Example, hello world on button click.

String concatenation

- In computer programming, a string is traditionally a sequence of characters, either as literal constant or variables.
  - `alert ("this is string literal constant");`
  - `let name = "Rakesh Shrestha";`
- In JavaScript, either single or double quotes can be used to surround text to make string literals.
- Strings can be concatenated using + operator to form a long string.
  - "Hello! " + name + " how are you?"

Example 2

- Program to ask for name using prompt and display greeting using alert.

Comments

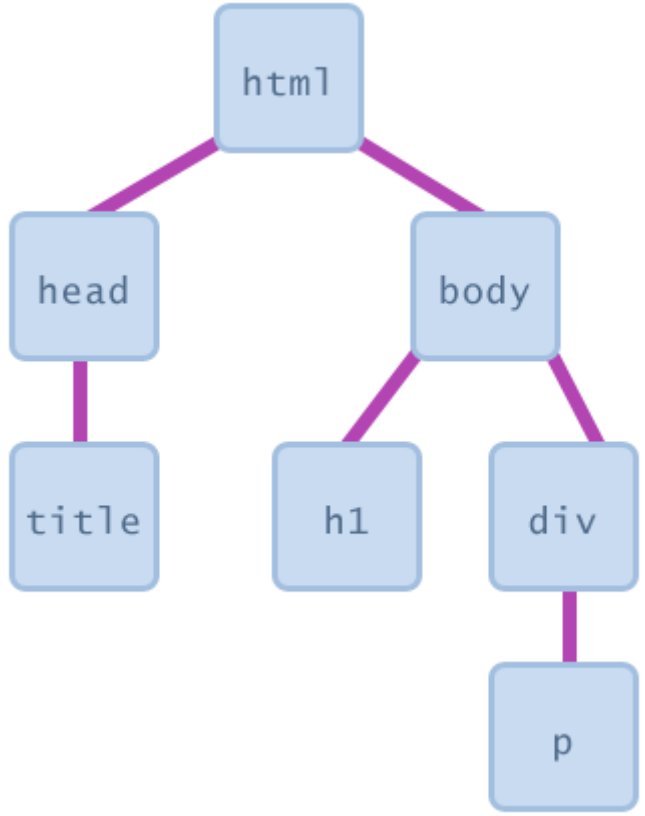
- A comment in a programming language is note or documentation that a programmer writes for himself (future reference) or other programmers who will use the code.
- Comments are ignored during code execution.
- There are two styles of commenting in JavaScript:
  - Single line comments, starts with //
  - Multiline comments, starts with /* and ends with */

HTML element's id attribute

- The id attribute specifies a unique identifier for a HTML element (the value must be unique within the HTML document)
- The id attribute is used to target elements in CSS, and in JavaScript (via. the HTML DOM)

Document Object Model (DOM)

- All HTML elements are represented in browsers as objects
- All objects are nested together in one tree (DOM tree)
- Elements can have parents, siblings and children
- Most JS code manipulates elements (objects) on the DOM
  - it can examine elements' state (see whether a box is checked)
  - it can change state (insert some new text into a span)
  - it can change styles (make a paragraph red)



Getting a DOM element using its id

- `document.getElementById("id")`
  - Get the element with the specified id.

- Example, Program to get first name and last name from the input fields and display full name inside span element on button click.

Other DOM selection APIs

- `getElementsByName("name")`
  - Get all the elements with the specified name
- getElementsByTagName("tag")
  - Get all the elements in the document with the specified tag name
- querySelector("selector")
  - Get the first element in the document that matches the specified CSS selector(s) in the document.
- querySelectorAll("selector")
  - Returns all the elements in the document that matches a specified CSS selector(s)

Main point

- JavaScript programs runs on events, that makes JavaScript an event driven programing language. We also perform our actions based on events that is either external or internal. *When we establish our self at the field of pure consciousness, we perform conscious actions rather than the compulsive ones.*

Assignments

- Reading Chapters 3 & 4
- Assignment from chapter 3 and 4

- Upload your assignments to your GitHub repository and submit your GitHub link on Sakai.