Web Programming: HTML, CSS, JS, PHP

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EECS 348: Software Engineering

What is HTML

- HTML (Hyper Text Markup Language), is a language used to build Web pages
- Using HTML, you can build a Web page with text, graphics, sound, and video
- The essence of HTML programming is tags
  - A tag is a keyword enclosed by angle brackets
  - There are opening and closing tags
  - The affected text is between the two tags
  - Tag commands can be in lower or uppercase
  - Tags can be nested

A real example of HTML

- An example of a web page

Spring 2024, EECS 348 Lab Seven

Hello everyone! This page is the index page of Lab7.
Please visit the following links to check what the other four practices should look like!
Try to make them more beautiful.
Practice1
Practice2
Practice3
Practice4

- Corresponding HTML codes

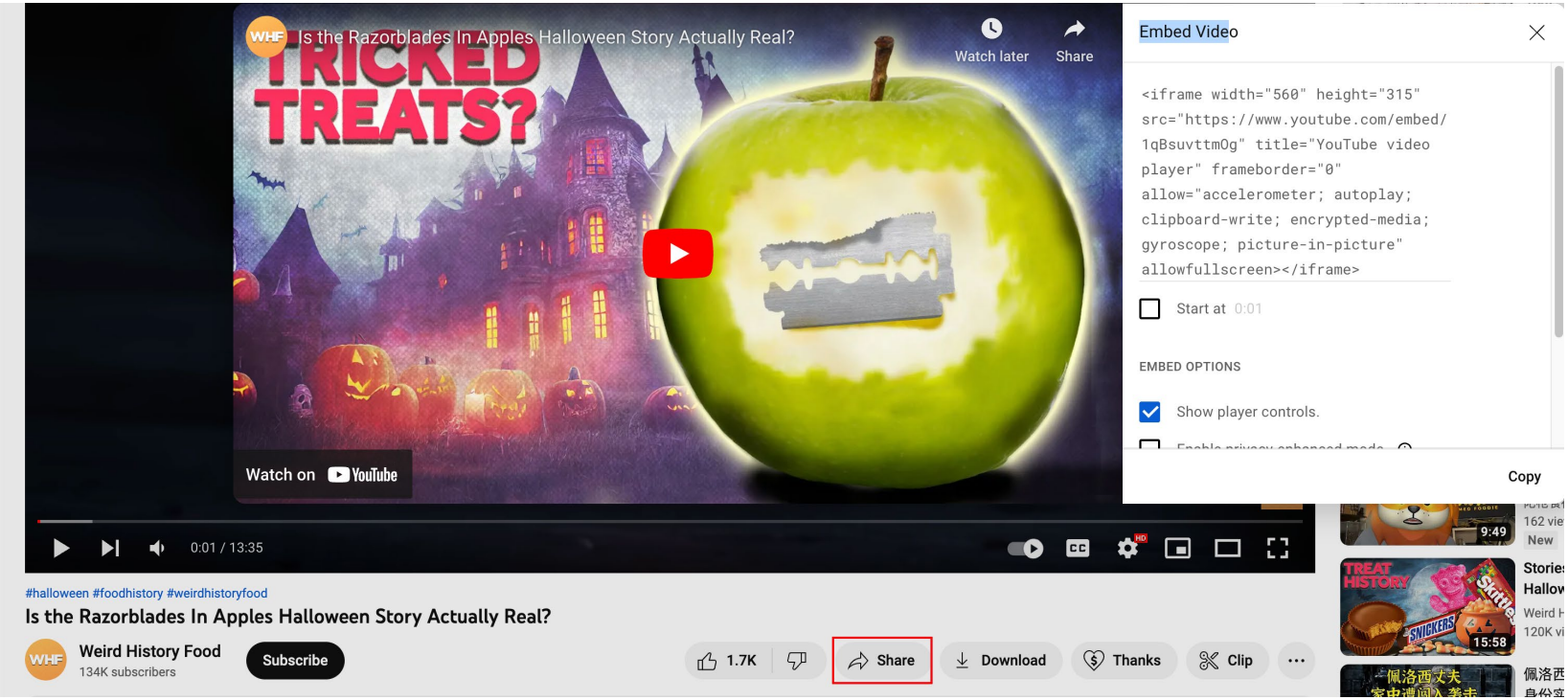
```
<html>

<head>
    <h1>Spring 2024, EECS 348 Lab Seven</h1>
</head>

<body>
    Hello everyone! This page is the index page of Lab7.<br>
    Please visit the following links to check what the other four practices should look like!<br>
    Try to make them more beautiful.<br>
    <a href="practice1.html">Practice1</a> <br>
    <a href="practice2.html">Practice2</a> <br>
    <a href="practice3.html">Practice3</a> <br>
    <a href="practice4.html">Practice4</a> <br>
</body>

</html>
```

Insert images

- Type `<IMG SRC = “image.png”>` , where image. png indicates the location of the image file, it could be a local picture or a website picture URI
- The `WIDTH=n` and `HEIGHT=n` attributes can be used to adjust the size of an image
- The attribute `BORDER=n` can be used to add a border n pixels thick around the image

Insert videos

- How to insert complex things like a video?
  - Some websites offer the codes for you, just use it!



Links

- A link lets you move from one page to another, play movies and sound, send email, download files, and more….
- A link has three parts: a **destination**, a **label**, and a **target**
- To create a link type

```
<A HREF="page.html"> label </A>
```

- The label is the text that will appear underlined or highlighted on the page

What is JavaScript?

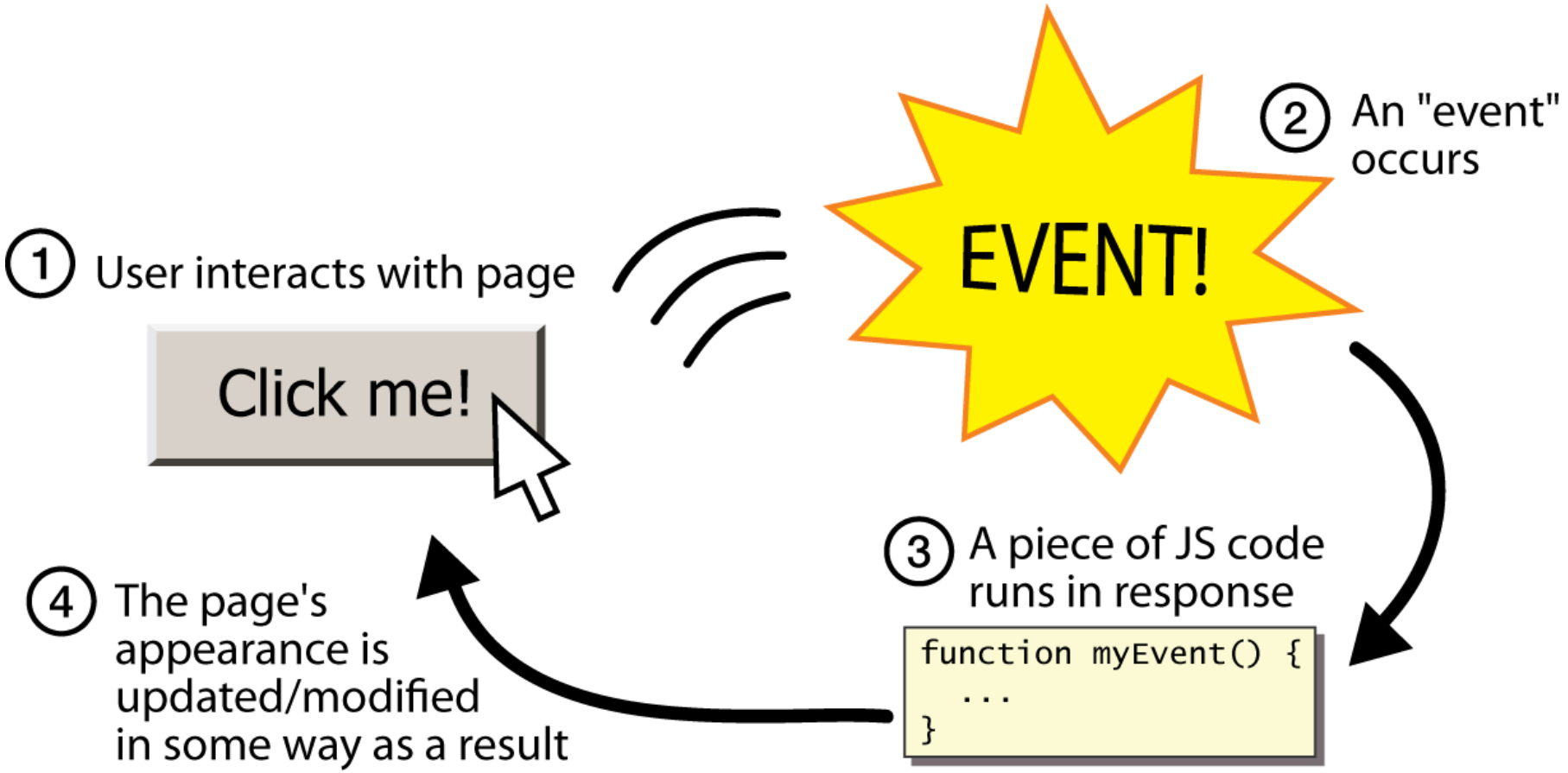
- A lightweight programming language ("scripting language")
  - used to make web pages interactive
  - insert dynamic text into HTML (e.g., user name)
  - **react to events** (ex: page load user click)
  - get information about a user's computer (ex: browser type)
  - perform calculations on user's computer (ex: form validation)
- A web standard (but not supported identically by all browsers)
- **Not** related to Java other than by name and some syntactic similarities

Linking to a JavaScript file: script

```
<script src="filename" type="text/javascript"></script>
```

- Script tag should be placed in HTML page's head
- Script code is stored in a separate `.js` file
- JS code can be placed directly in the HTML file's body or head (like CSS)
  - But this is bad style (should separate content, presentation, and behavior

Event-driven programming



Get user input

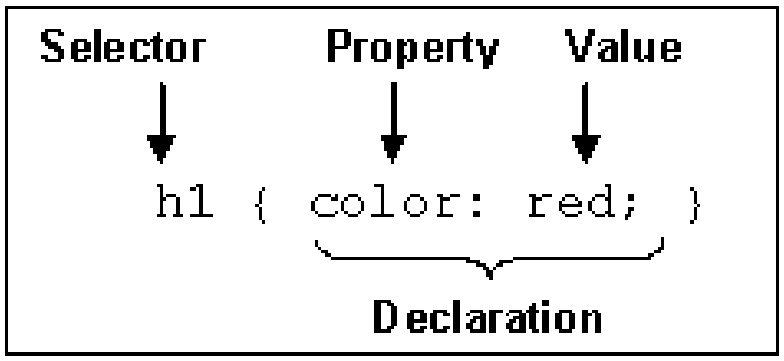
- HTML `<input type="text" id="input" value="">`
- Id is very important, JS use id to identify the variable to read or to write in HTML
- JS `var input = document.getElementById("input").value;`
- JS `document.getElementById("input").value = input;`

What is CSS?

- Cascading Style Sheet
  - Stylesheet Language
    - Standards-based set of properties and attributes to define styles
  - To describe the presentation a document written in a 'markup language' like HTML or XML
    - Markup encoding: My paragraph here.
    - Defines the style of how things in tags appear.
    - Font, color, size, margins, etc.
  - Cascading
    - Rules to determine how to
    - apply markup that contains
    - other markup

CSS syntax

- Three elements to a CSS statement
  - Selector
    - What HTML sections does it affect?
  - Property
    - What attribute of that HTML section will be affected?
  - Value
    - What change will be made to that attribute?



Why CSS

- Separate Content from form
  - Specify the style once for every instance of that class.
    - Example: Specify the font once for all text on the HTML page that you've identified as a "header"
  - The stylesheet can be a separate file which all HTML pages on your entire site can link to.
    - Only have to specify the style once for your ENITRE SITE
  - Can change the style for your entire site by editing only *one file*

Why CSS?

- Separate content from the form
  - Content is the text and images, marked up to define regions of specific types
  - Form defines the "style" for the content

The old way:

```
<font size="14px">
My First Header
</font>
<font size="12px" color="red"
face="Verdana">
My information 1 goes here.
</font>
<font size="14px">
My Second Header
</font>
<font size="12px" color="red"
face="Verdana">
Different information goes here.
</font>
```

Why CSS?

- Separate content from the form
  - Content

```
<div id="paragraph">
    Paragraph to be altered.
</div>
```

  - Form or Style

```
<style>
    #paragraph {
        border-style: solid;
        border-width: 10;
        background-color: burlywood;
        color: black;
        font-size: 18pt;
        background-image: url("");
    }
</style>
```

Three CSS definition locations

- Inline: the "style" attribute

```
<p style="font-color:red;font-size:10px;">Content</p>
```

  - Note, the selector for inline CSS is the tag that contains the style attribute

- Internal: the `<style>` markup tag

```
<html><head><style>
p {background-color: Red;
   font-family: serif;
   font-color: White; }
</style></head><body>
<p>Content</p>
</body></html>
```

- External: the .css stylesheet file

```
<link rel="stylesheet" type="text/css" href="mystylesheet.css" />
```

CSS syntax: selectors

- There are many kinds of selectors and many ways to reference them:
  - Type, Class, ID, etc.
- HTML Type Tag – selected with the tag type

```
p { font-size: 10px;
    font-color: White; }

<p>Content</p>
```

- The Class Attribute – precede the class with a period

```
.myinfo { font-size: 10px;
    font-color: White; }

<p class="myinfo">Content</p>
<div class="myinfo">Other content</div>
```

PHP

- A widely-used open-source scripting language
  - Free to download (php.net)
- Stands for Hypertext Preprocessor
- PHP scripts are executed on the server side
  - Not on a local machine (unless PHP is installed, and you are running a local webserver)

PHP files

- Have a default `.php` file extension
- May contain text, HTML, JavaScript, and PHP code
- PHP code is executed on the server, and the result is returned to the browser as plain HTML

Why PHP?

- PHP runs on different platforms (Windows, Linux, Unix, Mac OS X, etc.)
- PHP is compatible with almost all servers (Apache, IIS, etc.)
- PHP has support for a wide range of databases
- PHP is relatively easy to learn and runs efficiently on the server side
  - Lots of built-in functionality; familiar syntax
- PHP is well-documented:
  - Type `php.net/functionName` in browser address bar to get docs for any function

Basic syntax

- A PHP script starts with `<?php` and ends with `?>`

```
<?php
// PHP code goes here
?>
```

- The default file extension for PHP files is ".`php`".
- A PHP file normally contains HTML tags, and some PHP scripting code
- Each code line in PHP must end with a semicolon
  - The semicolon is a separator and is used to distinguish one set of instructions from another
- Two statements to output: `echo` and `print`

PHP variables

- Variable names start with `$` followed by the name
- A variable name must begin with a letter or the underscore character
- A variable name can only contain alphanumeric characters and underscores (A-z, 0-9, and _) and no spaces
- Variable names are case sensitive (`$y` and `$Y` are two different variables)

For loop (similar to C++ and Java)

```
for (initialization; condition; update) {
  statements;
}
```

Example

```
for ($i = 0; $i < 10; $i++) {
  print "$i squared is " . $i * $i . ".\n";
}
```

In the future

- Use the existing framework rather than writing HTML files by yourself
- Markdown + GitHub + Hugo/Hexo/Jekyll + (Netlify)