



# JavaScript

CSCI 201

Principles of Software Development

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# Outline

- JavaScript
- Program

# JavaScript



- JavaScript is a front-end interpreted language that gives the programmer more control and functionality than HTML and CSS
- JavaScript can be included
  - › In an attribute of a tag
  - › In a `<script>` tag
  - › In an external JavaScript file (typically named with a .js extension)
- JavaScript is officially known as ECMAScript
  - › ECMAScript was first standardized in 1997
  - › The current version of ECMAScript is 5.1, corresponding to JavaScript version 1.8.5, released in 2011



Is this image correct for JavaScript?

# Front-End or Back-End



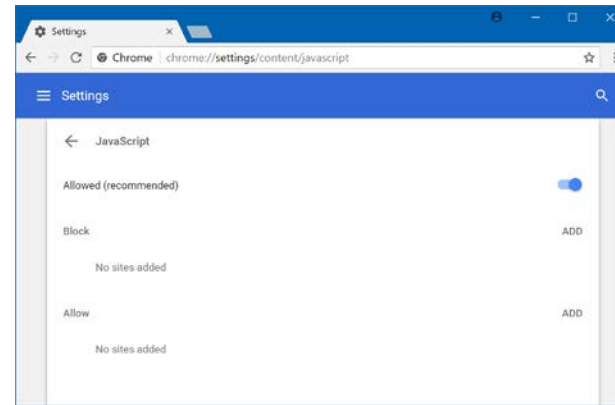
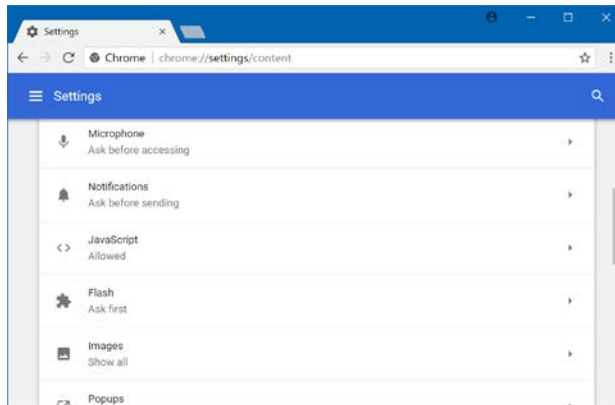
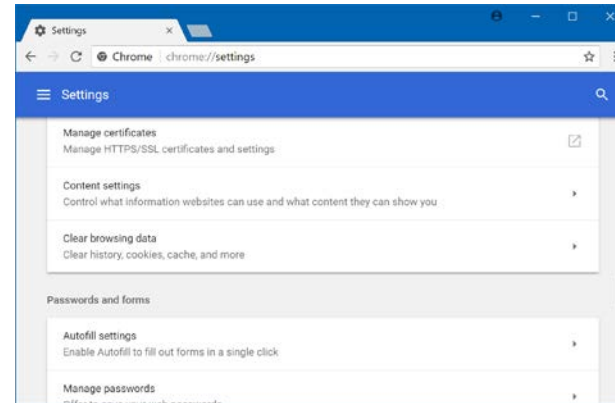
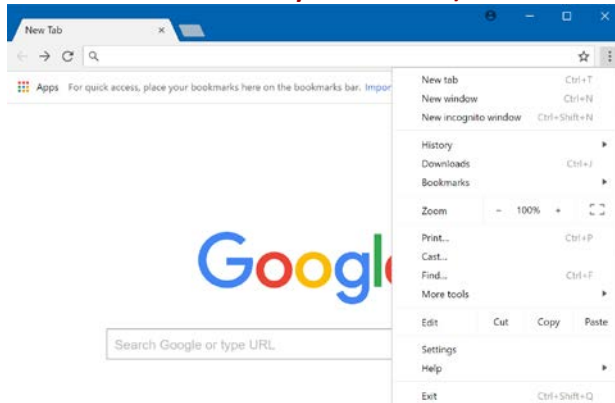
- Is JavaScript a front-end or back-end language?
  - › Traditionally it has been a front-end language, but there has been an increase in server-side JavaScript recently (such as `node.js`)
- Be careful if you are using client-side JavaScript because users can disable JavaScript in their browsers
  - › Form validation and other critical items should be done on the server-side (and possibly on the client-side as well if you want)



# Client-Side JavaScript



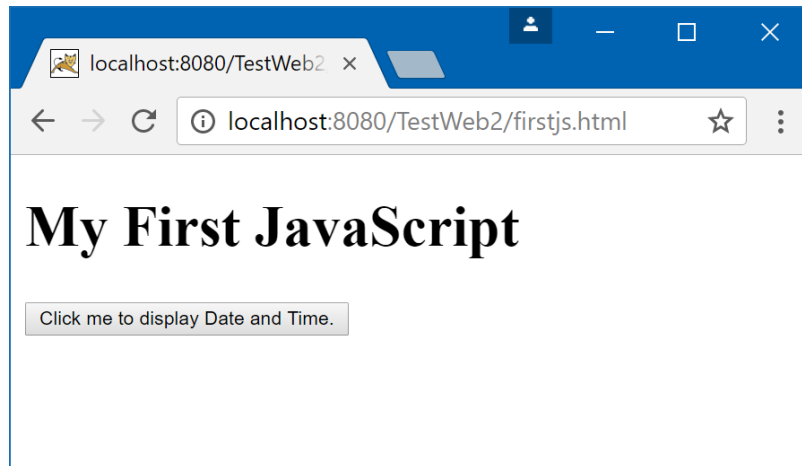
- Client-side JavaScript can be disabled in browsers
  - Form validation and other critical items should be done on the server-side (and possibly on the client-side as well if you want)



# My First JavaScript



```
1 <!DOCTYPE html>
2 <html>
3   <body>
4     <h1>My First JavaScript</h1>
5     <button type="button"
6       onclick="document.getElementById('demo').innerHTML = Date()">
7       Click me to display Date and Time.
8     </button>
9     <p id="demo"></p>
10  </body>
11 </html>
```



# My Second JavaScript



```
1 <!DOCTYPE html>
2 <html>
3   <body>
4     <h1>CSCI 201 JavaScript</h1>
5     <p>Click the button to see some hidden text.</p>
6     <p id="hello" style="display:none">Hello CSCI 201!</p>
7     <button type="button" onclick="document.getElementById('hello').style.display='block'">
8       Click Me!
9     </button>
10  </body>
11 </html>
```

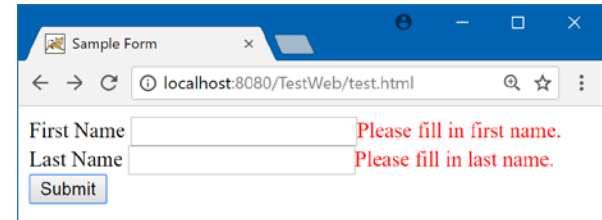
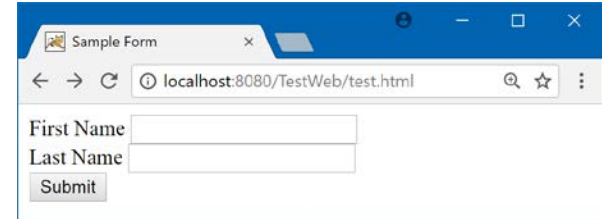


# JavaScript Functions 1



- JavaScript functions belong in the <head> tag or in an external JavaScript file

```
1 <!DOCTYPE html>
2 <html>
3   <head>
4     <title>Sample Form</title>
5     <script>
6       function validate() {
7         var hasError = false;
8         document.getElementById("fError").innerHTML = "";
9         document.getElementById("lError").innerHTML = "";
10        if (document.myform.fname.value.length <= 0) {
11          document.getElementById("fError").innerHTML = "<font color=\"red\">Please fill in first name.</font>";
12          hasError = true;
13        }
14        if (document.myform.lname.value.length <= 0) {
15          document.getElementById("lError").innerHTML = "<font color=\"red\">Please fill in last name.</font>";
16          hasError = true;
17        }
18        return !hasError;
19      }
20    </script>
21  </head>
22  <body>
23    <form name="myform" method="GET" action="form.jsp" onsubmit="return validate();">
24      First Name <input type="text" name="fname" /><span id="fError"></span><br />
25      Last Name <input type="text" name="lname" /><span id="lError"></span><br />
26      <input type="submit" name="submit" value="Submit" />
27    </form>
28  </body>
29 </html>
```





# JavaScript Functions 2



```
1 <!DOCTYPE html>
2 <html>
3   <head>
4     <title>Sample Form</title>
5     <script>
6       function sort() {
7         var arr = new Array();
8         arr[0] = Number(document.myform.num1.value);
9         arr[1] = Number(document.myform.num2.value);
10        arr[2] = Number(document.myform.num3.value);
11        arr[3] = Number(document.myform.num4.value);
12        arr[4] = Number(document.myform.num5.value);
13        for (var i=0; i < arr.length; i++) {
14          for (var j=i+1; j < arr.length; j++) {
15            if (arr[i] > arr[j]) {
16              var temp = arr[i];
17              arr[i] = arr[j];
18              arr[j] = temp;
19            }
20          }
21        }
22        var sortedArray = "";
23        for (var i=0; i < arr.length; i++) {
24          sortedArray += arr[i];
25          if (i != arr.length - 1) {
26            sortedArray += ",";
27          }
28        }
29        document.getElementById("sortednumbers").innerHTML = sortedArray;
30        return false;
31      }
32    </script>
33  </head>
```

```
34 <body>
35   <form name="myform" method="GET" onsubmit="return sort();">
36     Number 1 <input type="text" name="num1" /><br />
37     Number 2 <input type="text" name="num2" /><br />
38     Number 3 <input type="text" name="num3" /><br />
39     Number 4 <input type="text" name="num4" /><br />
40     Number 5 <input type="text" name="num5" /><br />
41     <input type="submit" name="submit" value="Submit" />
42   </form>
43   <div id="sortednumbers"></div>
44 </body>
45 </html>
```

Sample Form

localhost:8080/TestWeb2/form.html

Number 1

Number 2

Number 3

Number 4

Number 5

Sample Form

localhost:8080/TestWeb2/form.html

Number 1

Number 2

Number 3

Number 4

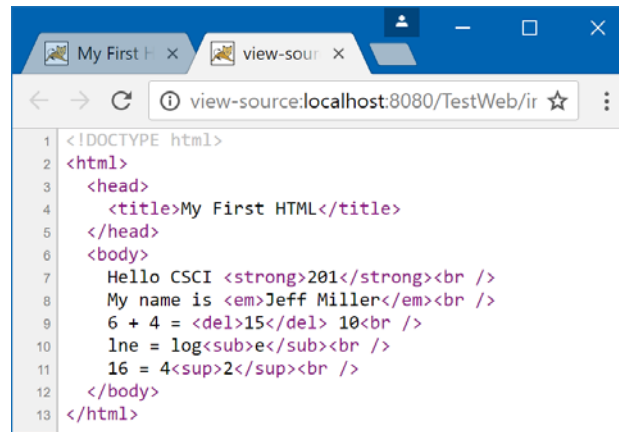
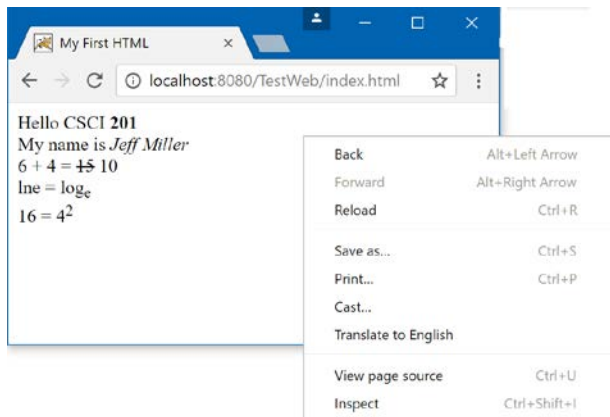
Number 5

4,5,7,10,11

# More JavaScript



- For more information on JavaScript
  - › Go to <http://www.w3schools.com/js/>
  - › View the source of any web page to see the JavaScript that was used on that page
  - › Go through one of many tutorials you find online





# Outline

- JavaScript
- Program

# Program



- Write a program that validates the form based on rules for different types of fields
  - Email should have an @ with at least one . After
  - Passwords should be at least 8 characters long with at least 1 number
  - Birthday must be a date in the past
  - New Student must have one option selected
  - College must have a value
  - Favorite color must have a value other than Black
  - Terms and Conditions must be checked
- Do not allow the form to be submitted otherwise.
- Put a message next to each field that is not formatted correctly

The screenshot shows a web browser window with the URL localhost:8080/TestWeb/schoolform.html. The form is titled "School Form" and contains the following fields:

- Email: jeffrey.miller@usc.edu
- Password: masked with asterisks
- Birthday: 01/01/2017
- New Student?: Radio buttons for Yes (selected) and No
- College: USC
- Major: Computer Science (dropdown menu)
- Favorite Color: Yellow (color picker)
- Terms and Conditions:  I agree.

At the bottom of the form are two buttons: "Reset Form" and "Submit Form".