

COMP 431/531: Web Development

Lecture 2: Forms

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<https://www.clear.rice.edu/comp431>



Homework

Homework Assignment 1 ([Simple Page](#))

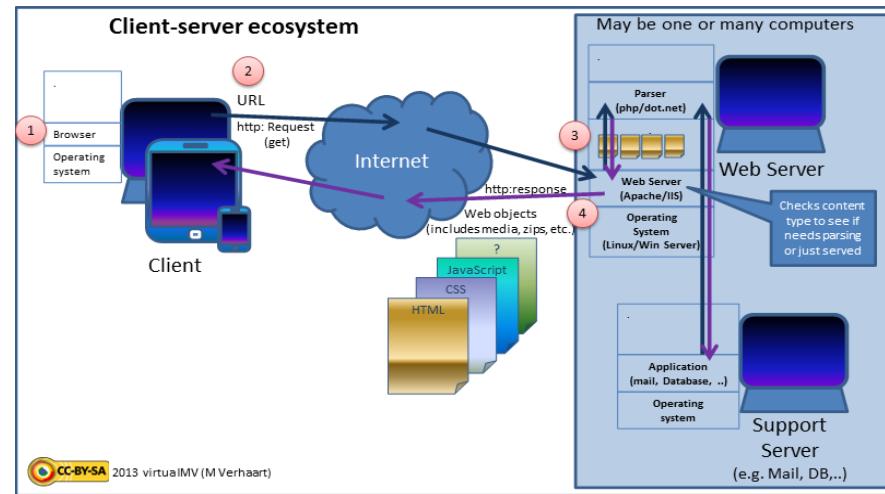
Due Thursday, 9/4 by 11:59 PM

<https://classroom.github.com/a/gsvZWVWoo> (hw1 repo)



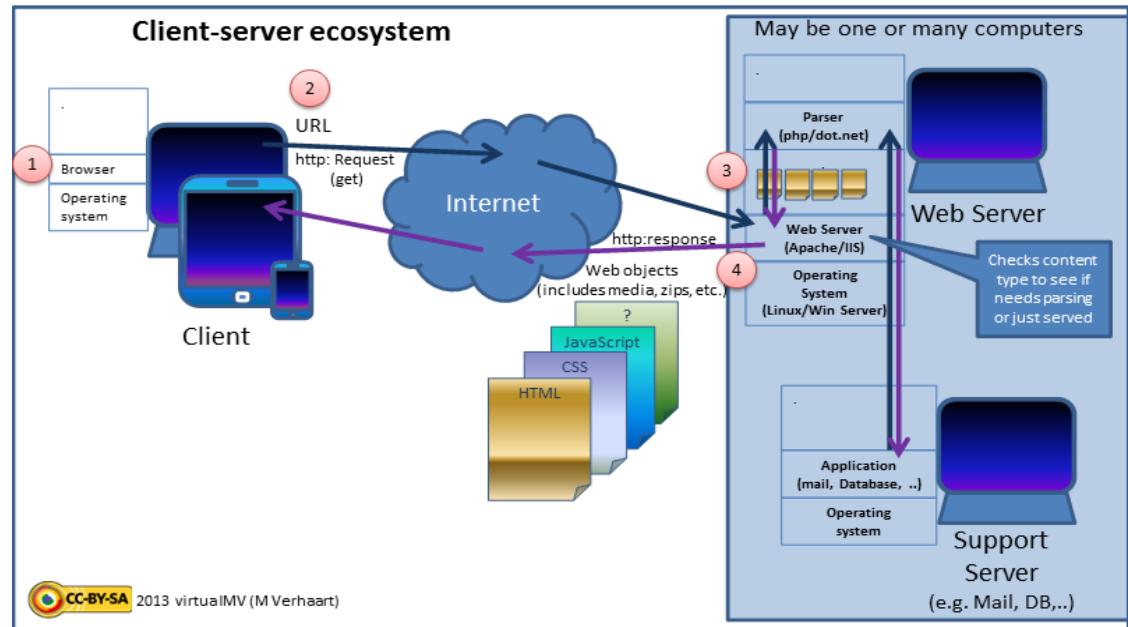
Hypertext Transfer Protocol (HTTP)

- Request-response protocol
- Client sends request
- Server replies with response
(typically returns a resource)



Common Status Codes

- Successful (2xx)
 - 200 = OK
- Redirection (3xx)
 - 302 = Found
- Client Error (4xx)
 - 400 = Bad Request
 - 401 = Unauthorized
 - 403 = Forbidden
 - 404 = Not Found
- Server Error (5xx)
 - 500 = Internal Server Error



Where is JavaScript?

- In your browser
- Add a script tag to a HTML page and view it in the browser

JavaScript does not necessarily play well through file://
...



Online Frontend Playground: jsfiddle.net

The screenshot shows the jsfiddle.net web application. The left sidebar contains various configuration options: Frameworks & Extensions (Mootools 1.4.5 selected), Fiddle Options, External Resources, Languages, Ajax Requests, and Legal, Credits and Links. Below these are social sharing links for Twitter and LinkedIn, and a Keyboard shortcuts link.

The main workspace is divided into three sections: HTML, CSS, and Result. The HTML section contains the following code:

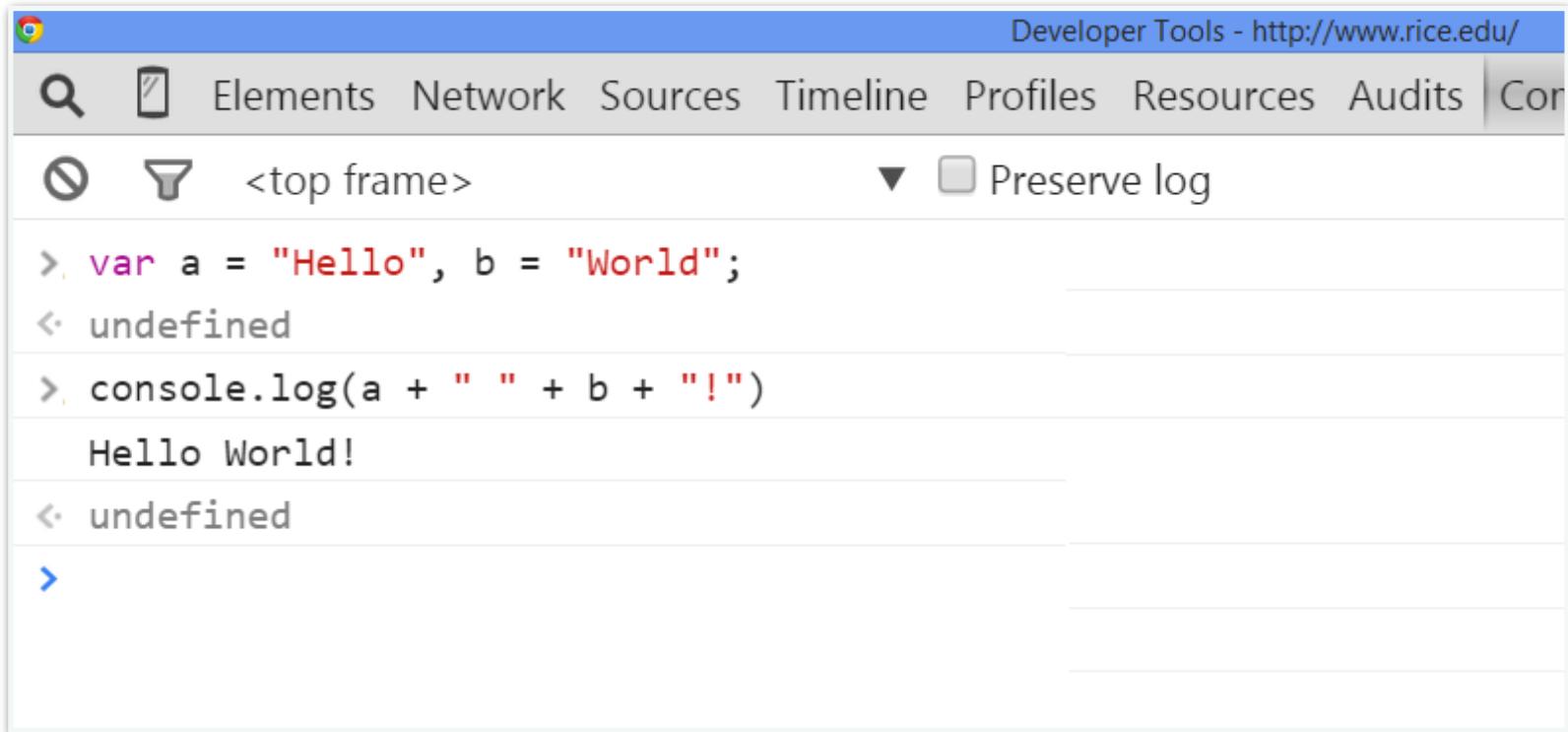
```
<h1 id="title">Javascript example no.2</h1>
<input type="text" id="myTextField"/>
<input type="submit" id="byBtn" value="Change" onclick="change()"/>
```

The CSS section is currently empty. The Result section displays the output of the code, showing a heading "Javascript example no.2" and a text input field with a "Change" button next to it.

At the bottom of the page, there is a footer bar with the text "Scott E" and standard browser navigation icons.



Hello World in console



The screenshot shows the Google Chrome Developer Tools interface, specifically the Console tab. The title bar reads "Developer Tools - http://www.rice.edu/". The toolbar includes icons for search, refresh, and various developer tools like Elements, Network, and Timeline. Below the toolbar, the frame selector shows "<top frame>" and a checkbox for "Preserve log" which is checked. The main console area contains the following code and output:

```
> var a = "Hello", b = "World";
<- undefined
> console.log(a + " " + b + "!")
Hello World!
<- undefined
>
```



Script tag

- The `<script>` tag defines a client-side script

```
<script>
  window.alert("Hello World!");
</script>
```

- Either has a source attribute or content:

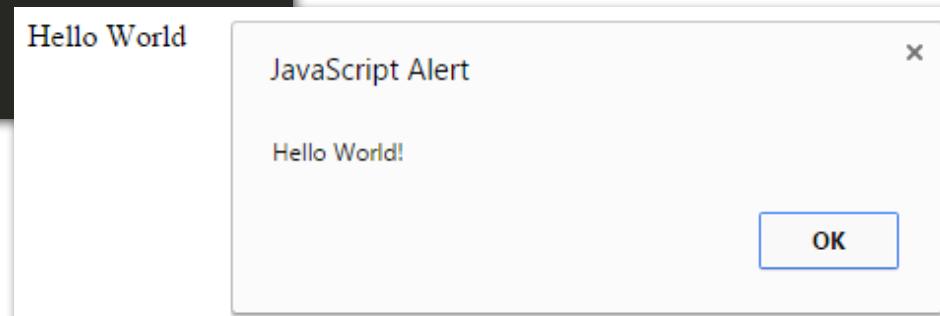
`src="https://code.jquery.com/jquery-3.7.1.js"`



Hello World in an HTML page

```
1 <html>
2 <body>
3 Hello World
4 </body>
5 <script>
6 | window.alert("Hello World!");
7 </script>
8 </html>
```

The “window” object is provided by the engine
Other built-ins include “navigator” and “document”





Forms

- Common in many web pages
- Typically used with a **POST** request
 - Larger payload, sensitive data
- GET is the default method
 - No payload, public data
- Contains **<input>** and **<button>** children
- Tag **<button>** similar to **<input type=submit>**.
- Labels with input tags are recommended, not required

```
<form  
method="" | "GET" | "POST")  
action=<url>  
id="myForm" >  
  
<input ... >  
</form>
```

id used for referencing
(**name** is deprecated)



Form Content

- Common `<form>` attributes are *id*, *method*, and *action*
- GET is the default form method
- In HTML5, can omit action attribute (stay on page)
- The action can be a url (e.g. <http://www.rice.edu>)
- Can use labels for input tags
- Input tags have name attribute
- Augment message for phone number, not useful on it's own

```
4 <form id="myForm" method="" action="#">
5   <p>Name: <input type="text" name="name"></p>
6   <p>Phone: <input type="tel" name="phone" pattern='\d\d\d'></p>
7   <input type="submit" value="Go!">
8 </form>
```

Please fill out this form

Name: David Leebron

Phone: 555-1234

Go!

! Please match the requested format.

button?



Useful Error Messages

- Error messages should be useful
 - HTML5 sometimes has helpful validations messages (i.e. email)
 - Validation message for phone number not really useful
- Augment error messages
 - Change the label to include format
 - Add a placeholder
 - Create custom validation message

A screenshot of a web browser displaying a form. The code for the form is shown at the top:

```
4 <form id="myForm" method="" action="#">
5   <p>Name: <input type="text" name="name"></p>
6   <p>Phone: <input type="tel" name="phone" pattern='\d\d\d'></p>
7   <input type="submit" value="Go!">
8 </form>
```

The form has two fields: 'Name' and 'Phone'. The 'Name' field contains 'David Leebron'. The 'Phone' field contains '555-1234'. A validation message 'Please match the requested format.' is displayed next to the 'Phone' input field. A button labeled 'Go!' is also present.

```
//enhance the error message when validating the phone number
const phone = document.getElementById("phone");
phone.addEventListener("input", function () {
  if (phone.validity.patternMismatch)
    phone.setCustomValidity("Expect proper format of 123-123-1234");
  else
    phone.setCustomValidity("");
});
```



Query Parameters

- Can be attached to any URL

<http://somesite.com:8080/example/?q=5&r=6>

- Most often used with GET requests



```
> location
<- ► Location {ancestorOrigins: DOMStringList, origin: "file://", hash: "",  
search: "?arg=value&second=string&number=15", pathname:  
> location.search
<- "?arg=value&second=string&number=15"
>
```



Input Type

The basics

- text
- password
- checkbox
- radio
- file
- submit
- reset

HTML 5

- search
- email  Please enter a part following '@'. 'mjoyner@' is incomplete.
- url
- tel (no validation)
- number
- range
- date
- color
- ...



Zip Code

- Zip code: number 5 digits
- Number type with pattern (allows 1 digit)
- Pattern works with the following input types:
 - text
 - date
 - search
 - url
 - tel
 - email
 - password



GET vs POST

- GET
 - Parameters in URL
 - Used to get data
 - Should have no side-effects
 - URL limit of 2083 characters (IE)
 - Browser can cache
- POST
 - Parameters in request body
 - Used to update server
 - In principle, no limit to payload size
 - Shouldn't be cached

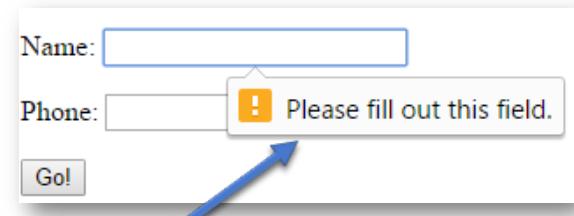
The screenshot shows a browser's developer tools Network tab with the Headers tab selected. The Request URL is /form-example.html?name=David+Leebron&phone=123. Under Request Headers, there are three entries: 'name' with value 'David Leebron' and 'phone' with value '123'. There are also links to 'view source' and 'view URL encoded'.



Form Submission

- Tag `<input>` has `onClick()` attribute
- Tag `<form>` has `onSubmit()` attribute
- Can validate forms prior to submission
 - Submit form when validation function returns true
 - Don't forget the `return`
- HTML5 has some builtin validation
 - Doesn't cover everything we'd want

```
8   <form method="get" id="regForm" action="https://www.netflix.com">
9     <label for="fname">Name:</label>
10    <input type="text" name="name" id="fname">
11    <input type="submit" value="Go" onclick="return goToPage()">
12  </form>
13  <script>
14    function goToPage() {
15      window.location.href = "https://www.rice.edu";
16      return false;
17    }
18  </script>
```



```
<input type="text" name="name" required></p>
<input type="tel" name="phone" pattern='\d\d\d\d'>
```



Radio Button

- Radio group: all radio buttons have same name
- Attribute `id` uniquely identifies html tag
- Only 1 button can be checked at a time

```
1 <p>Select a maintenance drone:</p>
2
3 <div>
4   <input type="radio" id="huey" name="drone" value="huey"
5     | checked>
6   <label for="huey">Huey</label>
7 </div>
8
9 <div>
10  <input type="radio" id="dewey" name="drone" value="dewey">
11  <label for="dewey">Dewey</label>
12 </div>
13
14 <div>
```

Select a maintenance drone:

- Huey
- Dewey
- Louie

Source: <https://developer.mozilla.org/en-US/docs/Web/HTML/Element/input/radio>



Checkbox

- Checkbox group: all check boxes attribute type “checkbox”
- Attribute `id` uniquely identifies html tag
- Multiple checkboxes can be checked at same time

```
1 <p>Choose your monster's features:</p>
2
3 <div>
4   <input type="checkbox" id="scales" name="scales"
5     checked>
6   <label for="scales">Scales</label>
7 </div>
8
9 <div>
10  <input type="checkbox" id="horns" name="horns">
11  <label for="horns">Horns</label>
12 </div>
```

Choose your monster's features:

Scales
 Horns

Source: <https://developer.mozilla.org/en-US/docs/Web/HTML/Element/input/checkbox>



Form Example

<https://codepen.io/aarongustafson/pen/KppxxY>



Hidden Fields

Store extra data sent with form, e.g. session id

```
11 <form id="myForm2" method="" action="#">
12   <p>Name: <input type="text" name="name"></p>
13   <p>Phone: <input type="tel" name="phone" pattern="^\d{3}\d{3}\d{4}$"></p>
14   <p><input type="hidden" name="secret" value="message"></p>
15   <input type="submit" value="Go!">
16 </form>
```

Please fill out this form

Name:

Phone:

Name:

Phone:

▼Query String Parameters

name: This One

phone: 456

secret: message



Date Object

- JavaScript has numerous builtins
- Date object is modeled after `java.util.Date` (JDK 1.0)
- Can obtain in local time (e.g. year) or UTC (universal) time.

```
> Date.now()
< 1440354508583
> new Date(Date.now())
< Sun Aug 23 2015 13:28:35 GMT-0500 (Central Daylight Time)
> new Date(1440000000000)
< Wed Aug 19 2015 11:00:00 GMT-0500 (Central Daylight Time)
< Wed Aug 19 2015 11:00:00 GMT-0200 (Central Daylight Time)
< new Date(1440000000000)
```



Encoding

Advice: use JavaScript console to help figure this out

Name:

▼ General

Request URL: /form-example.html?name=This+is+a+test%3F&phone=123

► Request Headers (3)

▼ Query String Parameters [view source](#) [view URL encoded](#)

name: This is a test?
phone: 123

```
> decodeURIComponent(location.search.substring(1).split('&')[0].split('=')[1])  
< "This+is+a+test?"  
> encodeURIComponent('a+b')  
< "a%2Bb"
```

