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/gsvZWWoo (hw1 repo)
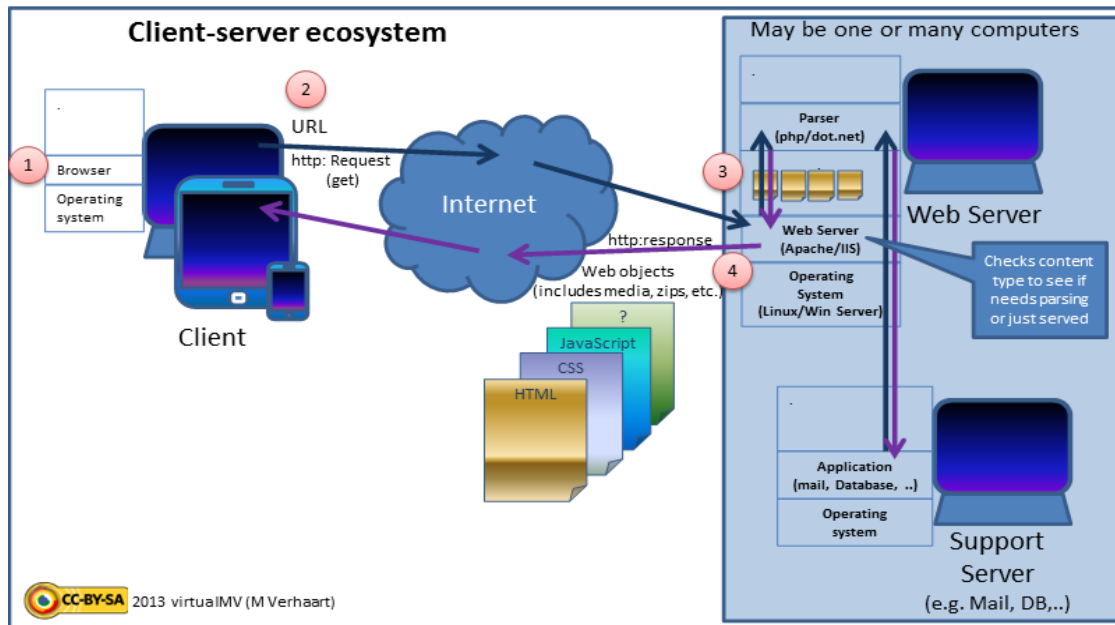
Hypertext Transfer Protocol (HTTP)

- Request-response protocol

- Client sends request

- Server replies with response (typically returns a resource)
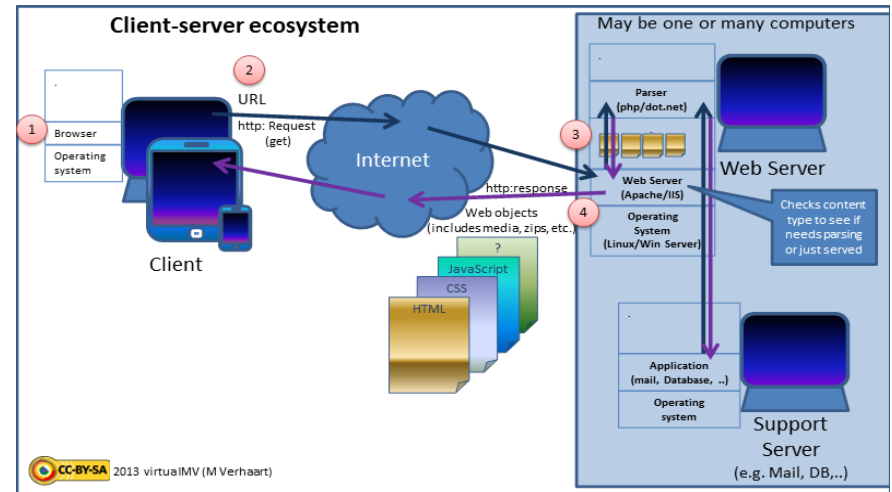
Common Status Codes

- Successful (2xx)
  - 200 = OK

- Redirection (3xx)
  - 302 = Found

- Client Error (4xx)
  - 400 = Bad Request
  - 401 = Unauthorized
  - 403 = Forbidden
  - 404 = Not Found

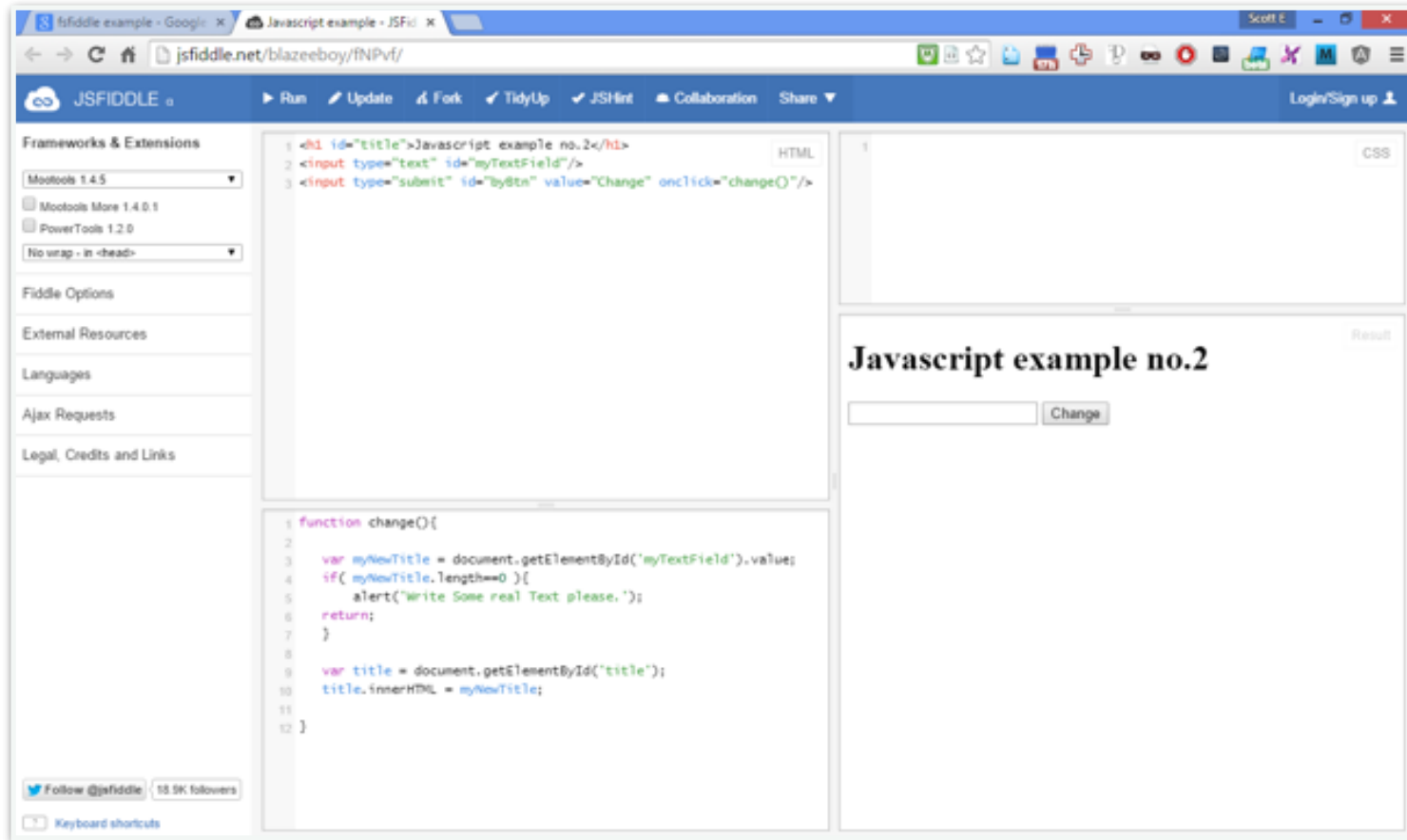- Server Error (5xx)
  - 500 = Internal Server Error

Where is JavaScript?

- In your browser

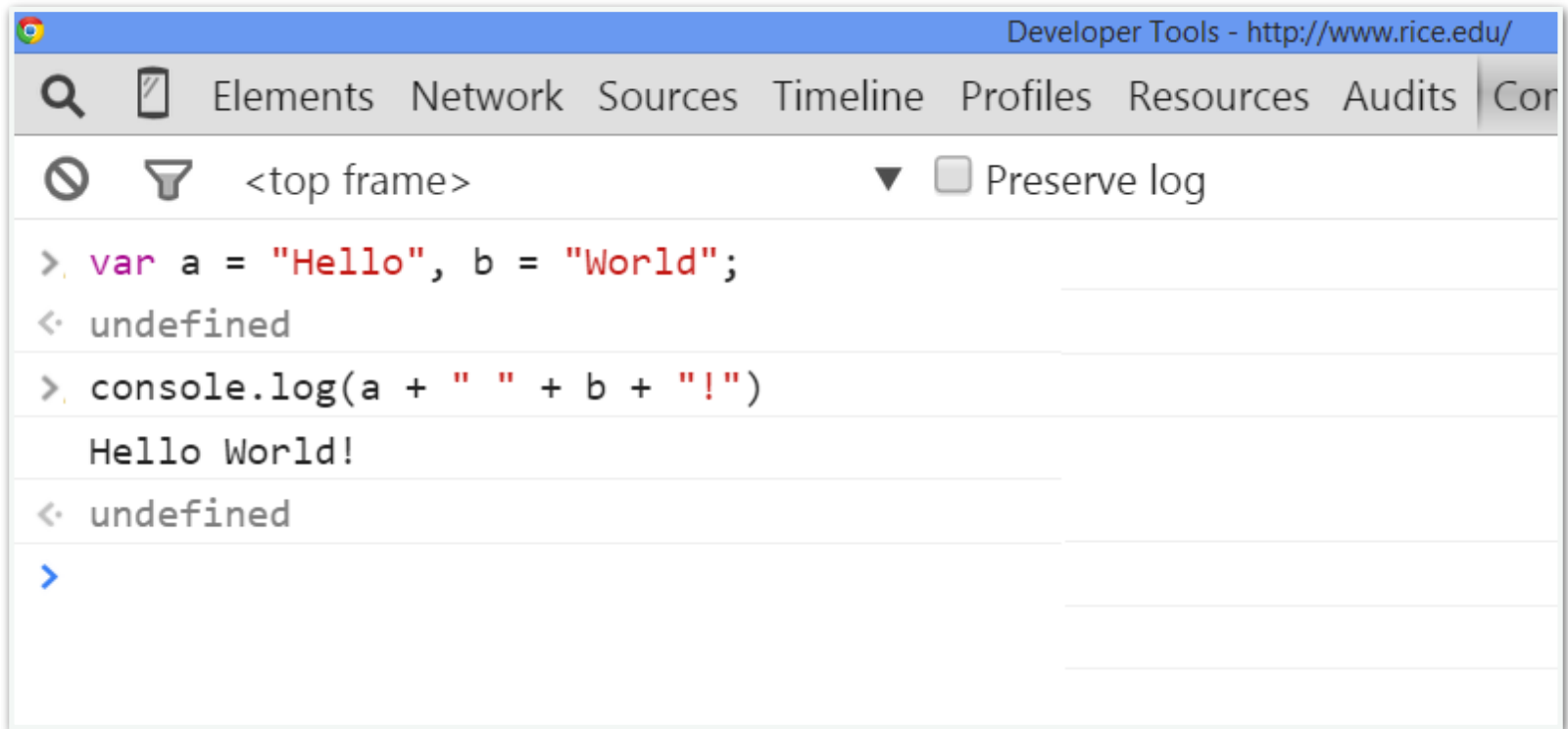- Add a script tag to a HTML page and view it in the browser

> JavaScript does not necessarily play well through file://
> …

Online Frontend Playground: jsfiddle.net

COMP 431/531, Fall 2025 (M.Joyner)

Hello World in console

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"

Hello World

JavaScript Alert ✕

Hello World!

OK

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

⚠ Please match the requested format.

Go!

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


```html
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>
```
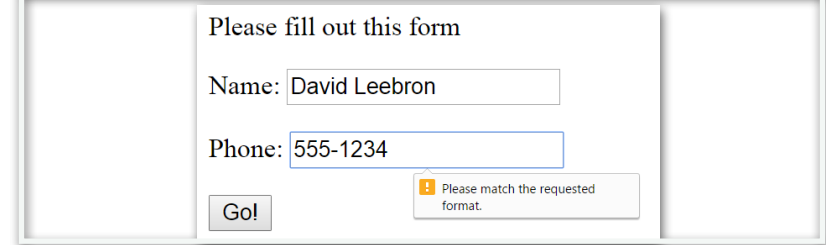
Please fill out this form

Name: David Leebron

Phone: 555-1234

Go!   ⚠ Please match the requested format.

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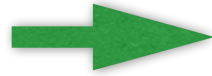
```
> location
< ▶ Location {ancestorOrigins: DOMStringList, origin: "file://", hash: "",
    search: "?arg=value&second=string&number=15", pathname:
> location.search
< "?arg=value&second=string&number=15"
>
```

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

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>
```

Name: [   ]

Phone: [   ] ⚠ Please fill out this field.

Go!

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

Please fill out this form

Name: [   ]

Phone: [   ]

[Go!]

Name: [This One   ]

Phone: [456   ]

[Go!]

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

▼ 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)
```

Encoding

Advice: use JavaScript console to help figure this out

Name: `This is a test?`

▼ **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"
```