



RICE[®]

Web Development

COMP 431 / COMP 531

HTTP and Forms

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January 14, 2016

Recap

- Administration
- Office Hours
- HTML
- Homework Assignment 1 (Simple Page)
 - Due Tuesday after class by 2 AM

There is a class at 4PM
in Sym II Tuesday

We'll see about today...

Our class ends at 3:45PM
if you still want help from me
we can go to my office DCH 2062
(otherwise I disappear)

QUESTIONS?

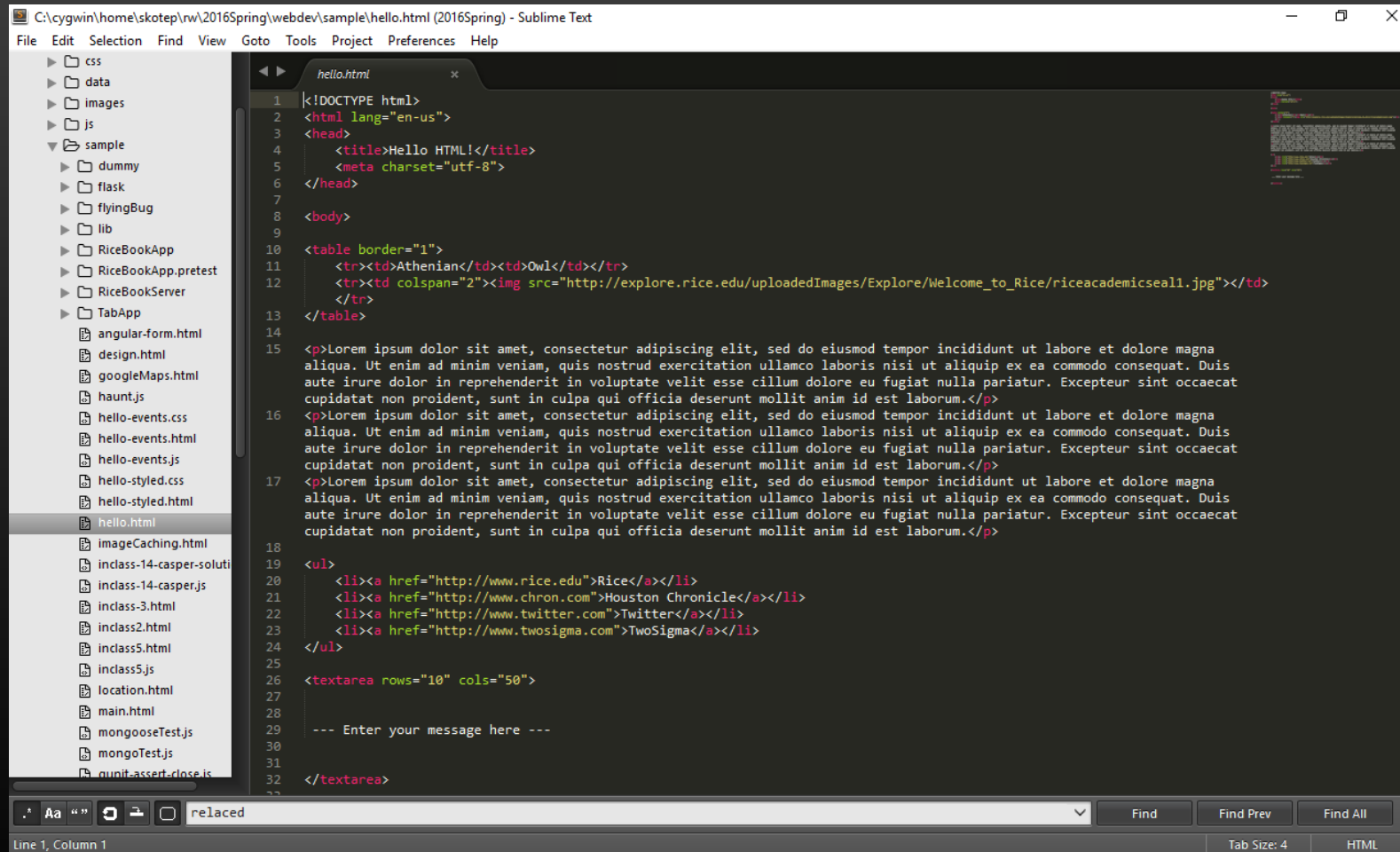


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Editors: I use Sublime Text 3



inclass-1: hello.html

Good practice to include "lang" and "charset"
Mandatory to include DOCTYPE !

```
<!DOCTYPE html>
```

```
<html lang="en-us">
```

```
  <head>
```

```
    <meta charset="utf-8">
```

```
    <meta name="author" content="Scott Pollack">
```



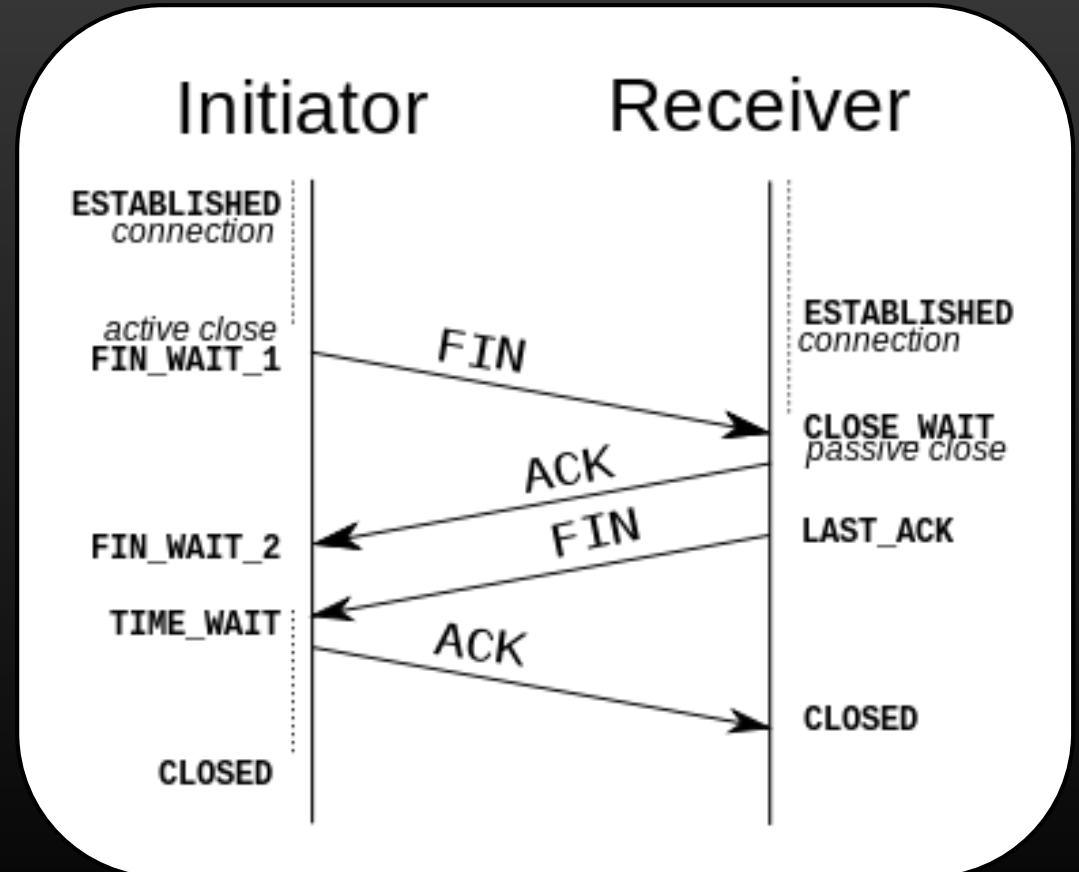
No spaces between attribute and value

Today's Agenda

- HTTP
- JavaScript
- Forms
- In Class Form Exercise

Transmission Control Protocol

- Clients (initiator) and Servers (receiver)
- Resilient
- http (https) is *generally* routed on port 80 (443)
- https is “**HTTP over TLS**” (transport layer security)
 - successor to SSL (secure sockets layer)
 - No good reason *not* to use it...



Hypertext Transfer Protocol (HTTP)

- 1965 – hypertext
 - 1989 – WWW
 - 1991 – HTTPV0.9
 - 1996 – HTTPV1.0
 - Mid-1996 – HTTP/1.1
 - May 2015 – HTTP/2
(0.4% websites support 7/2015)
(Likely TLS only)
(server push)
(parallel loading)
- Request-response protocol
 - Client sends request
 - Server replies with response
 - Typically returning a resource


```
#> telnet 128.42.208.7 80
Trying 128.42.208.7...
Connected to 128.42.208.7.
Escape character is '^]'.
GET / HTTP/1.1
Host: www.clear.rice.edu
```

telnet <host> <port>

```
GET / HTTP/1.1
Host: www.clear.rice.edu
```

```
HTTP/1.1 302 Found
Date: Sun, 23 Aug 2015 14:32:59 GMT
Server: Apache/2.2.15 (Red Hat)
Location: https://www.clear.rice.edu/
Content-Length: 296
Content-Type: text/html; charset=iso-8859-1
```

```
<!DOCTYPE HTML PUBLIC "-//IETF//DTD HTML 2.0//EN">
<html><head>
<title>302 Found</title>
</head><body>
<h1>Found</h1>
<p>The document has moved <a href="https://www.clear.rice.edu/">here</a>.</p>
<hr>
<address>Apache/2.2.15 (Red Hat) Server at www.clear.rice.edu Port 80</address>
</body></html>
```

```
telnet> quit
Connection closed.
#> █
```

```
#> openssl s_client -connect www.clear.rice.edu:443  
CONNECTED(00000004)
```

...

```
Timeout      : 300 (sec)  
Verify return code: 0 (ok)
```

```
GET / HTTP/1.1  
Host: www.clear.rice.edu
```

```
HTTP/1.1 200 OK  
Date: Sun, 23 Aug 2015 14:35:13 GMT  
Server: Apache/2.2.15 (Red Hat)  
Last-Modified: Mon, 17 Feb 2014 22:09:36 GMT  
ETag: "354ebd-14fe-4f2a1693b7ecd"  
Accept-Ranges: bytes  
Content-Length: 5374  
Content-Type: text/html; charset=UTF-8
```

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN" "http://www.w3.c  
1-transitional.dtd">  
<html xmlns="http://www.w3.org/1999/xhtml">  
<head>  
<meta http-equiv="Content-Type" content="text/html; charset=ISO-8859-1" />  
<title>Rice University</title>  
<link rel="stylesheet" href="style.css" type="text/css" media="all" />
```



<host>:<port>

GET / HTTP/1.1
Host: www.clear.rice.edu

Requests

```
GET / HTTP/1.1
Host: www.clear.rice.edu
```

<verb> <url> <protocol>
<fieldKey>: <fieldValue>

- Verbs (aka method): GET, HEAD, POST, PUT, DELETE, TRACE, OPTIONS, CONNECT, PATCH
- Guidelines
 - GET = no side effects
 - PUT / DELETE = idempotent

HTTP/1.1 additionally requires the **Host** header field

Request Header

- Handshake connection properties
 - E.g., upgrade requests
- Resource caching
- Redirects
- ...

Request Header Field Examples

`Accept: text/html,application/xhtml+xml`

`Accept-Encoding: gzip, deflate`

`Accept-Language: en-US, en`

`Authorization: Basic`

`Connection: keep-alive`

`Cookie: blah=foo; gigo=true`

`User-Agent: Mozilla/5.0 (Windows NT 6.3) ...`

`Origin: http://myfavorite.pony.com:1905`




**Connection: Upgrade
to get WebSockets!**

Responses

- Status Line
 <protocol> <code> <reason>
- Header with fields and values
 - Confirms upgrade
 - Cached file info
 - ...
- Content

```
HTTP/1.1 200 OK
Date: Sun, 23 Aug 2015 14:35:13 GMT
Server: Apache/2.2.15 (Red Hat)
Last-Modified: Mon, 17 Feb 2014 22:09:36 GMT
ETag: "354ebd-14fe-4f2a1693b7ecd"
Accept-Ranges: bytes
Content-Length: 5374
Content-Type: text/html; charset=UTF-8

<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0
```



```
HTTP/1.1 302 Found
Date: Sun, 23 Aug 2015 14:32:59 GMT
Server: Apache/2.2.15 (Red Hat)
Location: https://www.clear.rice.edu/
Content-Length: 296
Content-Type: text/html; charset=iso-8859-1

<!DOCTYPE HTML PUBLIC "-//IETF//DTD HTML 2.0//EN">
```

Response Header Field Examples

`Access-Control-Allow-Origin: *`

`Allow: GET, POST`

`Upgrade: websocket`

`Connection: Upgrade`

`Content-Encoding: gzip`

`Set-Cookie: blah=bar`

Status Codes

- Informational 1XX
- Successful 2XX
 - 200 = OK
 - 201 = Created
 - 202 = Accepted
 - 204 No Content
- Redirection 3XX
 - 301 = Moved Permanently
 - 302 = Found
- Client Error 4XX
 - 400 = Bad Request
 - 401 = Unauthorized
 - 403 = Forbidden
 - 404 = Not Found
- Server Error 5XX
 - 500 Internal Server Error
 - 501 Not Implemented

Today's Agenda

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- Forms
- In Class Form Exercise

Where is JavaScript?

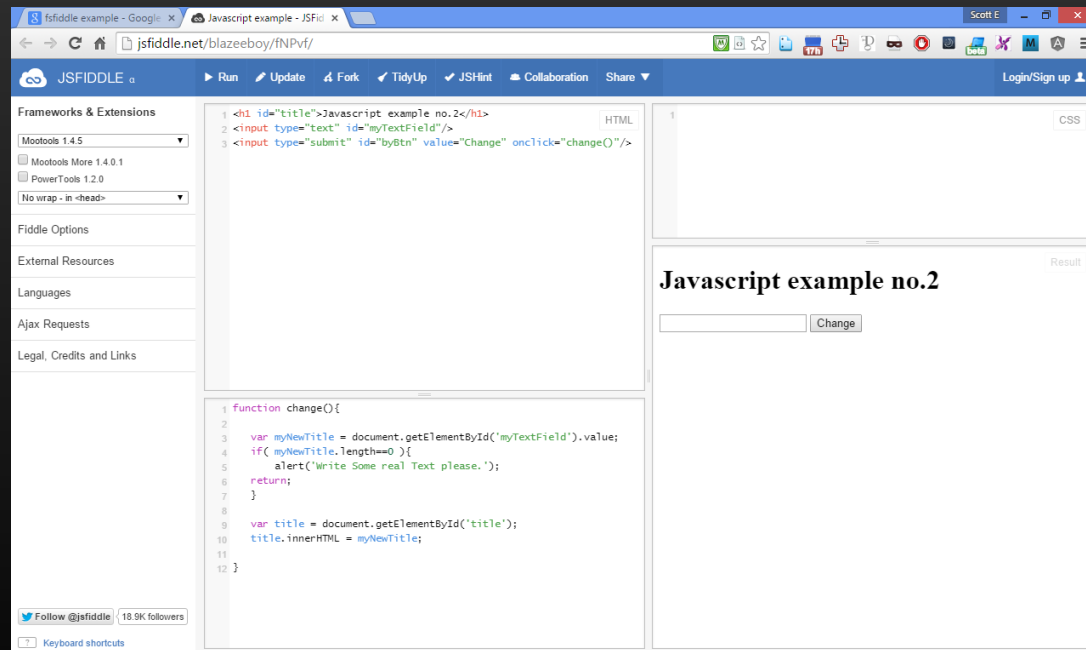
- In your browser
- Add a script to a HTML page and view in browser

JavaScript does not necessarily
play well through file://

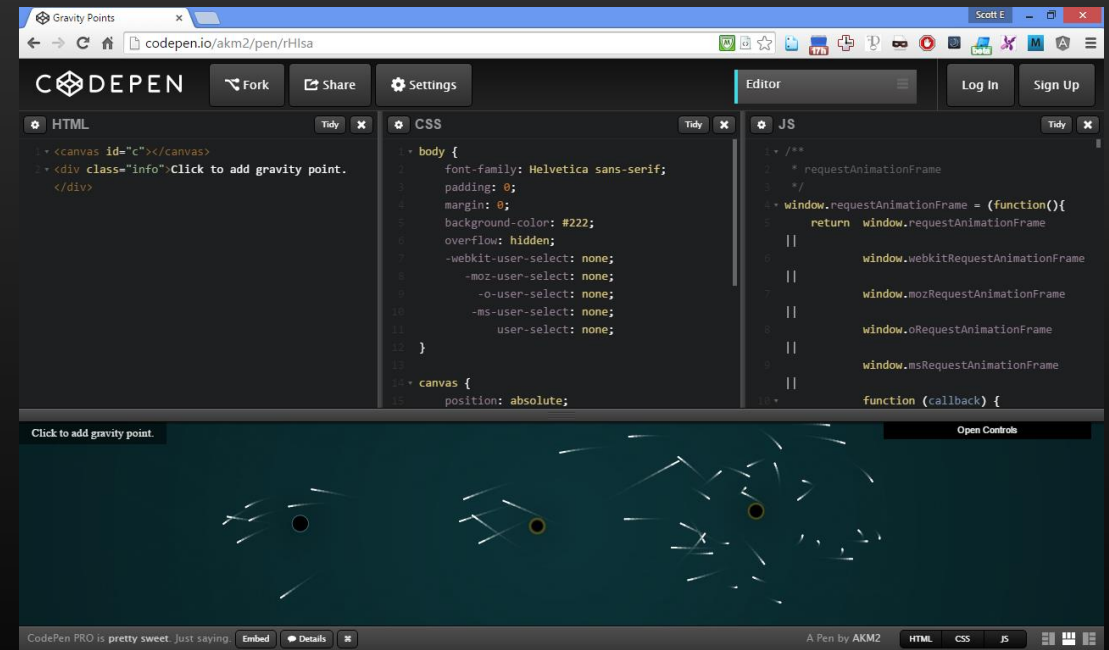
...

Online Frontend Playgrounds

- JavaScript can evaluate JavaScript
- Therefore we can easily create an online JavaScript environment (or use someone else's)

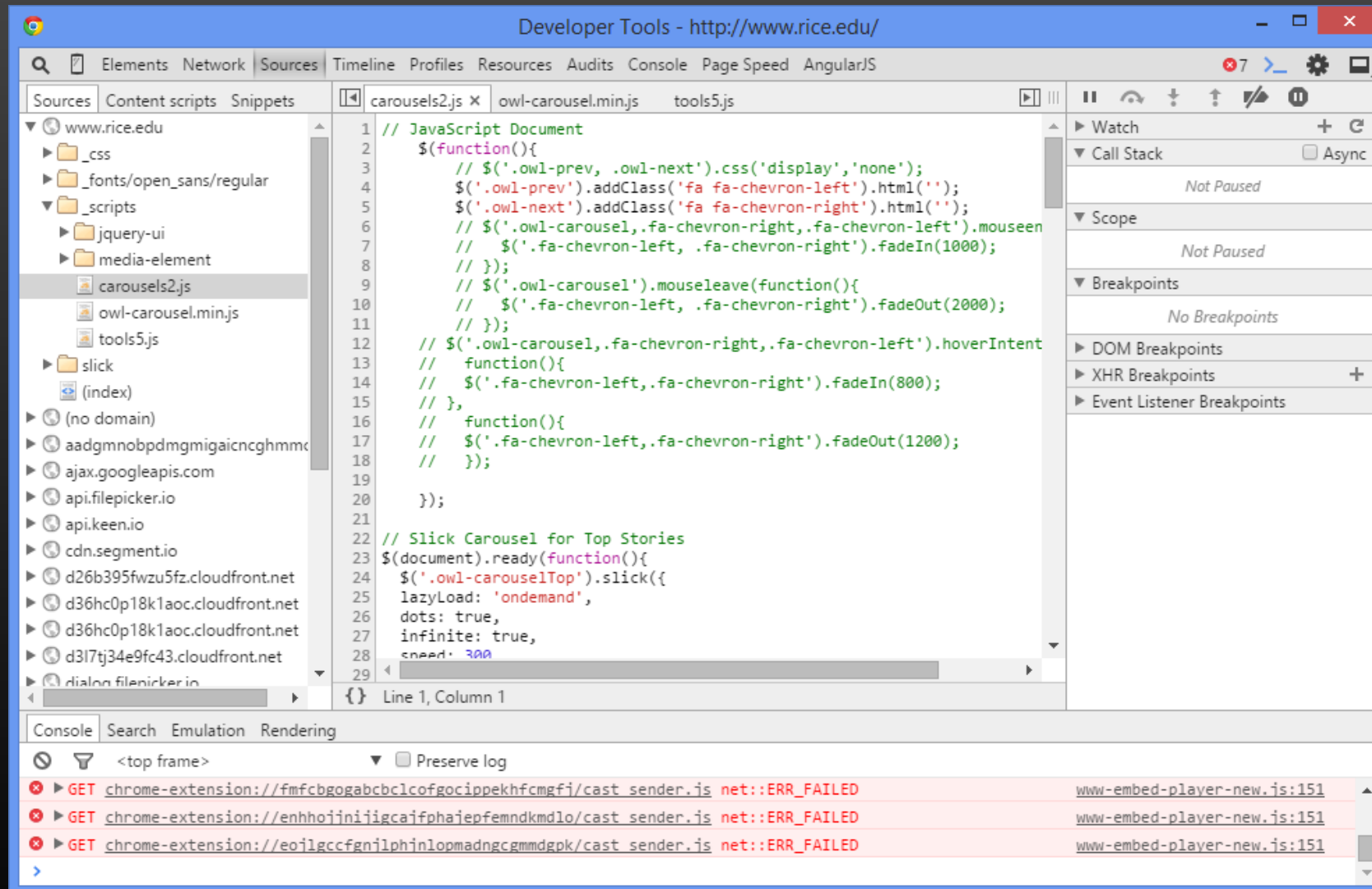


jsfiddle.net



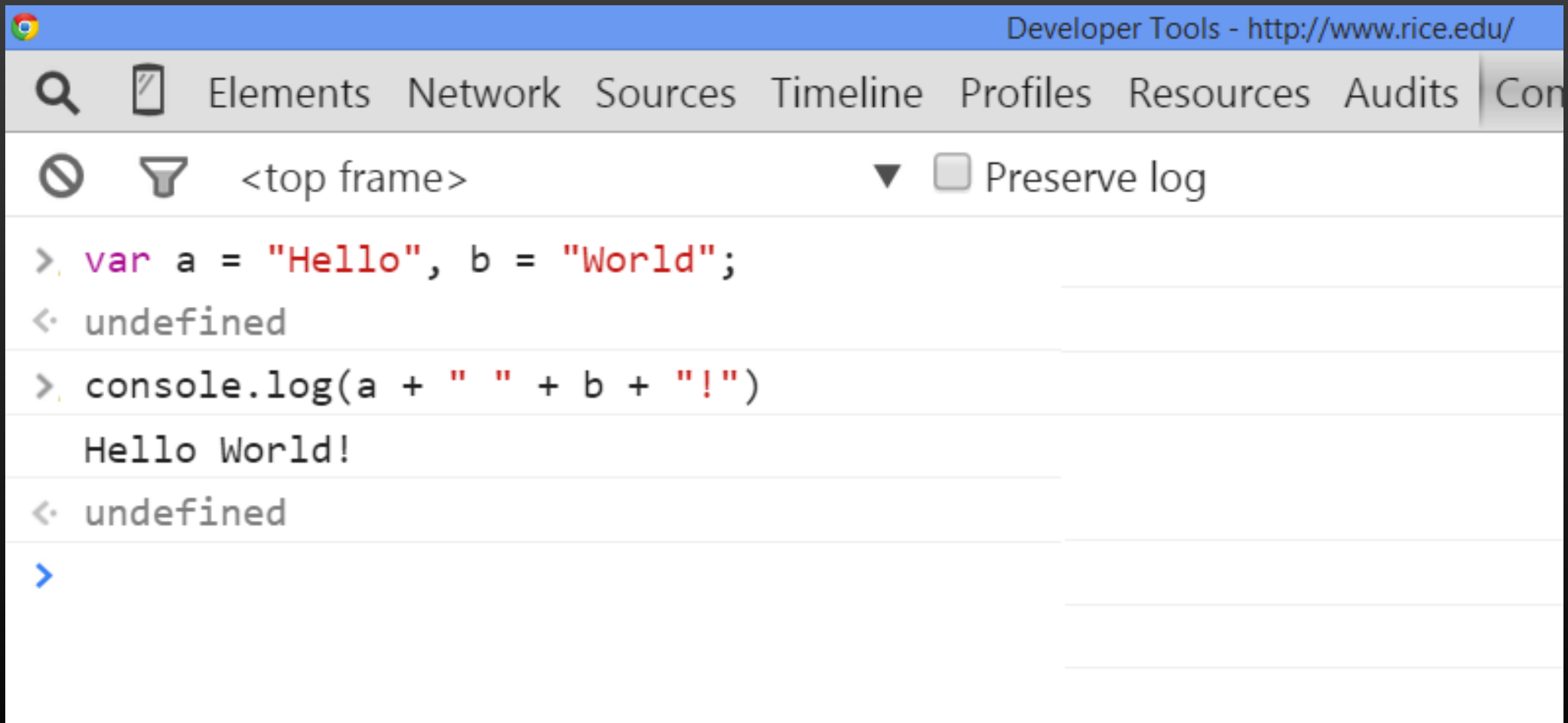
codepen.io

Chrome Developer Tools (Firebug)



FYI: You may need to enable Developer mode to get access to the console in Safari

Hello World in console



Script tag

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

- Previously needed a type attribute

`type="text/javascript"`

- Either has a source attribute

`src="https://ajax.googleapis.com/ajax/libs/jquery/2.1.3/jquery.min.js"`

or content

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

Hello world in a 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

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Query Parameters

- Can be attached to any URL

<http://somesite.com:8080/example/page.php?q=5&b=8#someAnchor>

- 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"
>
```

Forms

- The work horse of many a web page
- Typically used with **POST** requests
 - POST allows for a larger payload
- Contains `<input>` and `<button>` children

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

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

Form contents

```
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:

Phone:

Go!



Please match the requested format.

button?

Input Type

More on these later...

The Basics

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

HTML5

- search
- email
- url
- tel
- number
- range
- date
- color
- ...

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
- May update the server (watchout for repeated requests)
- In principle no limit to payload size
- Shouldn't be cached

The GET gotcha

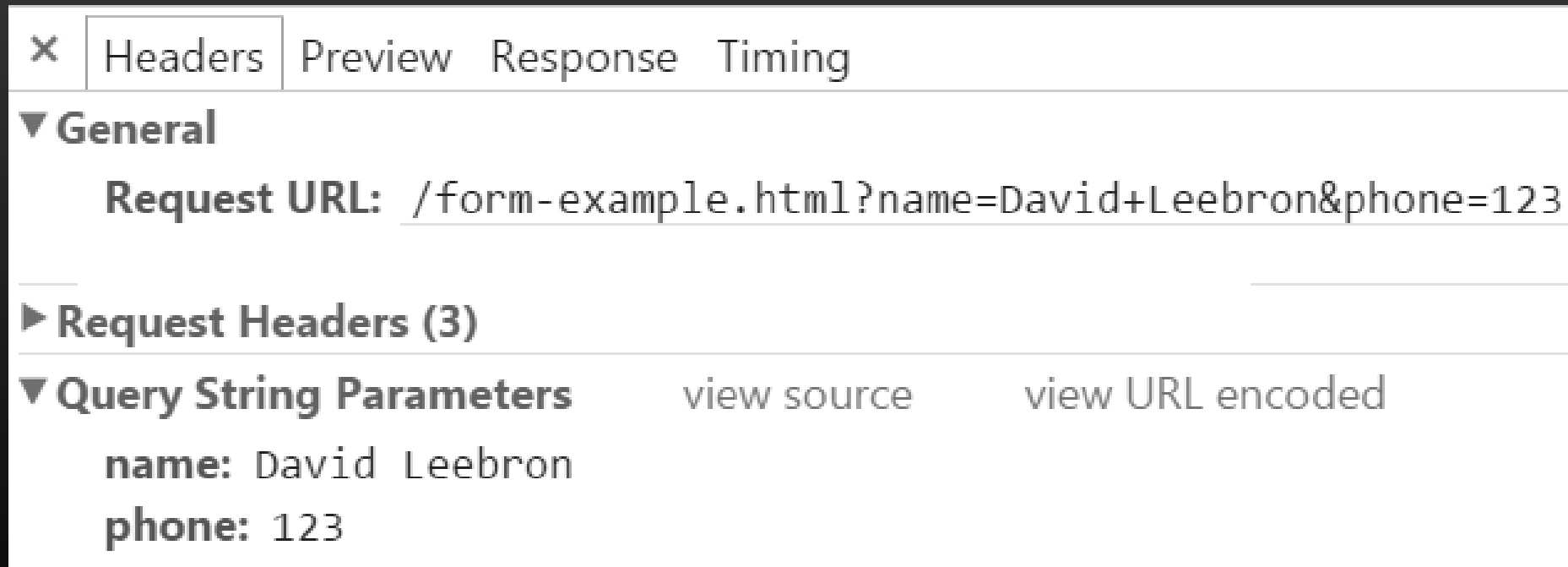
GET *should* have **NO** side-effects

- GET is **so** easy
- Parameters sent in URL is sweet and simple
- How about a **delete** button?
 - For example it might GET **/delete?id=2**
- Browser plugin: **Google Web Accelerator**
 - Scans a page and executes all GETs to cache
 - This is **great** because it speeds up our surfing experience
 - This is **bad** because we just hit all of those **delete** links... oops!

Form Submission (GET)

- Properly fill out form and click the button

`/form-example.html?name=David+Leebron&phone=123`



The screenshot shows a web browser's developer console with the 'Headers' tab selected. The console displays the details of a GET request to the URL `/form-example.html?name=David+Leebron&phone=123`. The 'General' section shows the 'Request URL' as `/form-example.html?name=David+Leebron&phone=123`. The 'Request Headers' section is collapsed. The 'Query String Parameters' section is expanded, showing two parameters: `name: David Leebron` and `phone: 123`. There are also links for 'view source' and 'view URL encoded'.

×	Headers	Preview	Response	Timing
▼ General				
Request URL: <code>/form-example.html?name=David+Leebron&phone=123</code>				
▶ Request Headers (3)				
▼ Query String Parameters				
name: David Leebron				
phone: 123				

Form Submission POST

```
<form id="myForm" method="POST" action="#">
```

× Headers Preview Response Timing

▼ General

Request URL: /form-example.html?name=David+Leebron&phone=123

► Request Headers (5)

▼ Query String Parameters

view source view URL encoded

name: David Leebron

phone: 123

▼ Form Data

view source view URL encoded

name: Try a POST

phone: 987

Hidden Fields

- Can be useful to store extra data that is 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\d\d"></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:

Go!

Name:

Phone:

Go!

▼ Query String Parameters

name: This One

phone: 456

secret: message

Aside on Date

- JavaScript has numerous built-ins
- Date object is modelled after JDK 1.0 `java.util.Date`

```
> 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)
```

```
< M6q vñ8 Jð 50T2 TT:00:00 CWL-0200 (C6UfL9J D9λJTḡμf 1Tω6)
```

```
> new Date(1440000000000)
```

Form Validation

- ... the bane of JavaScript?
- Why do we need it?

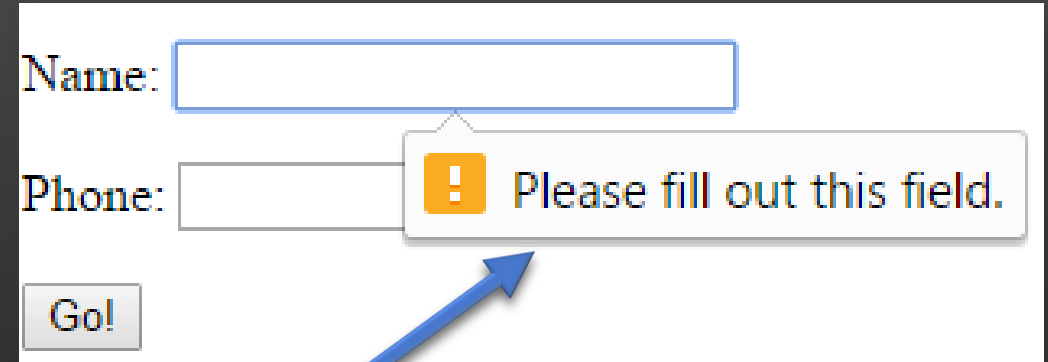
Form Validation

- HTML5 has some built-in validation
 - But it's not everything we'd ever want

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

- We pre-validate before the built-in HTML5 validation using an onclick event handler attached to the submit button

```
<input type="submit" value="Go!" onclick="return doSomething()">  
</form>  
<script>  
function doSomething() {  
    window.alert('something');  
    return false;  
}
```



onclick truthy says to submit form or not
We'll talk more about events later

Form Validation Example

```
36     <input type="submit" value="Go!" onclick="return doSomethingBetter()">
37 </form>
38                                     onclick="return doSomethingBetter(this.parent)"
39 <script>
40 function doSomethingBetter(form) {
41     if (!form) {
42         // find the right one?
43         var allFormsAsArray = document.forms;
44         // better to get by id
45         form = document.getElementById('myFormValidated')
46     }
47     console.log(form)
48
49     return (form.name.value === "Scott"
50         && form.phone.value == 123)
51 }
52 </script>
```

Encoding...

- How about

▼ 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"
```

In-Class Exercise:

Pizza Order Form

Make a validated Pizza Order Form

1. Text fields for customer name and street address
2. Phone number
3. User selects size of pizza (radio button group)
4. User selects toppings (check boxes)
5. Button to Place Order
6. Button to Clear form
7. Validate required name, address, valid phone number, size of pizza has been selected.
8. The Form should make a GET request to `formProcessor.html`
9. Write `formProcessor` to take the query string and displays it in a table, ala HW1

Turnin pizza.html to COMP431-S16:inclass-2

Pizza Guys!

Order # : 1 Date and Time: 12/6/2006 7:41:37 PM

Customer Name

First M.I. Last

Address

Street Name ST, LN, WY, CT, BLVD

Street

Phone Number

Area Code ### #####

() -

Pizza Size

☒ Large (\$20) ☐ Medium (\$15) ☐ Small (\$10) ☐ Personal (\$7)

Toppings (\$.75 each)

☐ Sausage ☐ Pepperoni ☐ Olives ☐ Anchovies ☐ Onions

Extra Cheese (\$.50)

☒ Yes or ☐ No

Quantity

Payment Type

☐ Visa ☐ MasterCard ☐ Debit ☐ Check ☒ Cash

C.C. #: CVC#:

Expiration Date:

Coupon ID #:

