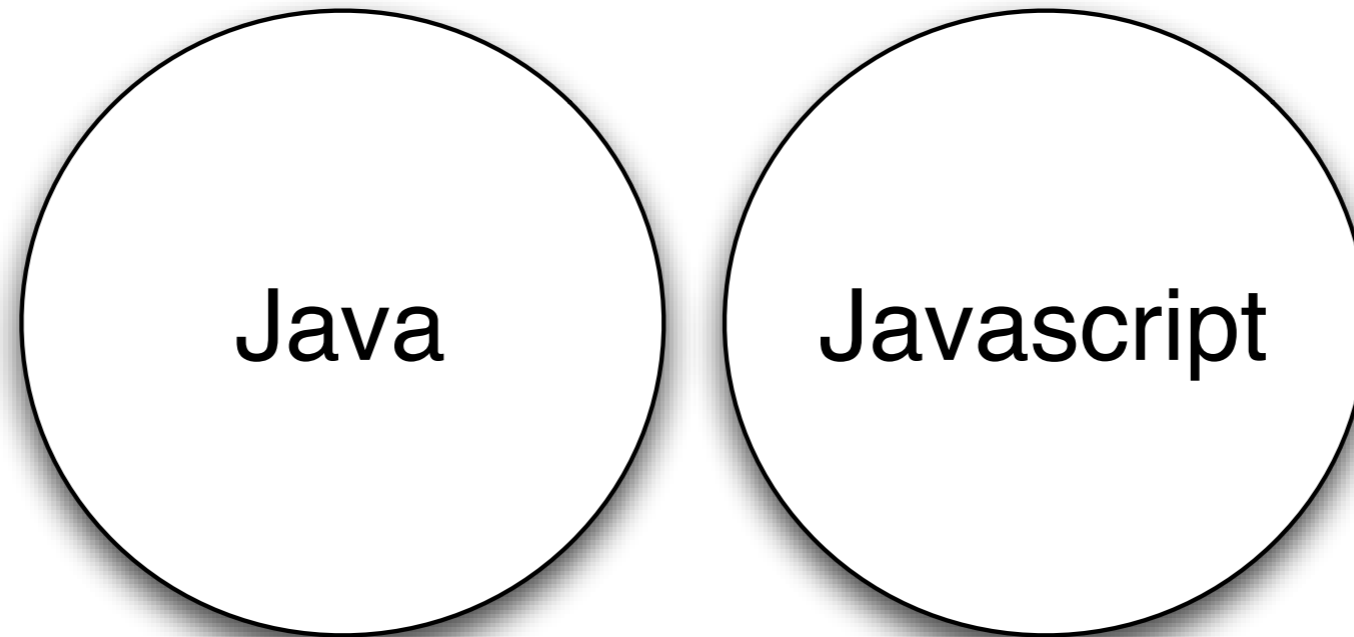


User Interaction: Introduction to Javascript

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INF 133 Fall 2012





- Java and Javascript are not the same
 - They unfortunately share the same name
 - They are different in what they are designed to do
 - They are different in how they came to be
- Java is more powerful and complex

- JavaScript gives web designers a programming tool
 - Simple syntax
 - Supports putting "snippets" of code into web pages
- JavaScript can put dynamic text into an HTML page
 - A JavaScript statement like this:
 - `document.write("<h1>" + name + "</h1>")`
 - can write the content of a variable into a web page
- JavaScript can react to events
 - A JavaScript can be set to execute when something happens, like when a page has finished loading or when a user clicks on an HTML element

Here is the most confusing thing

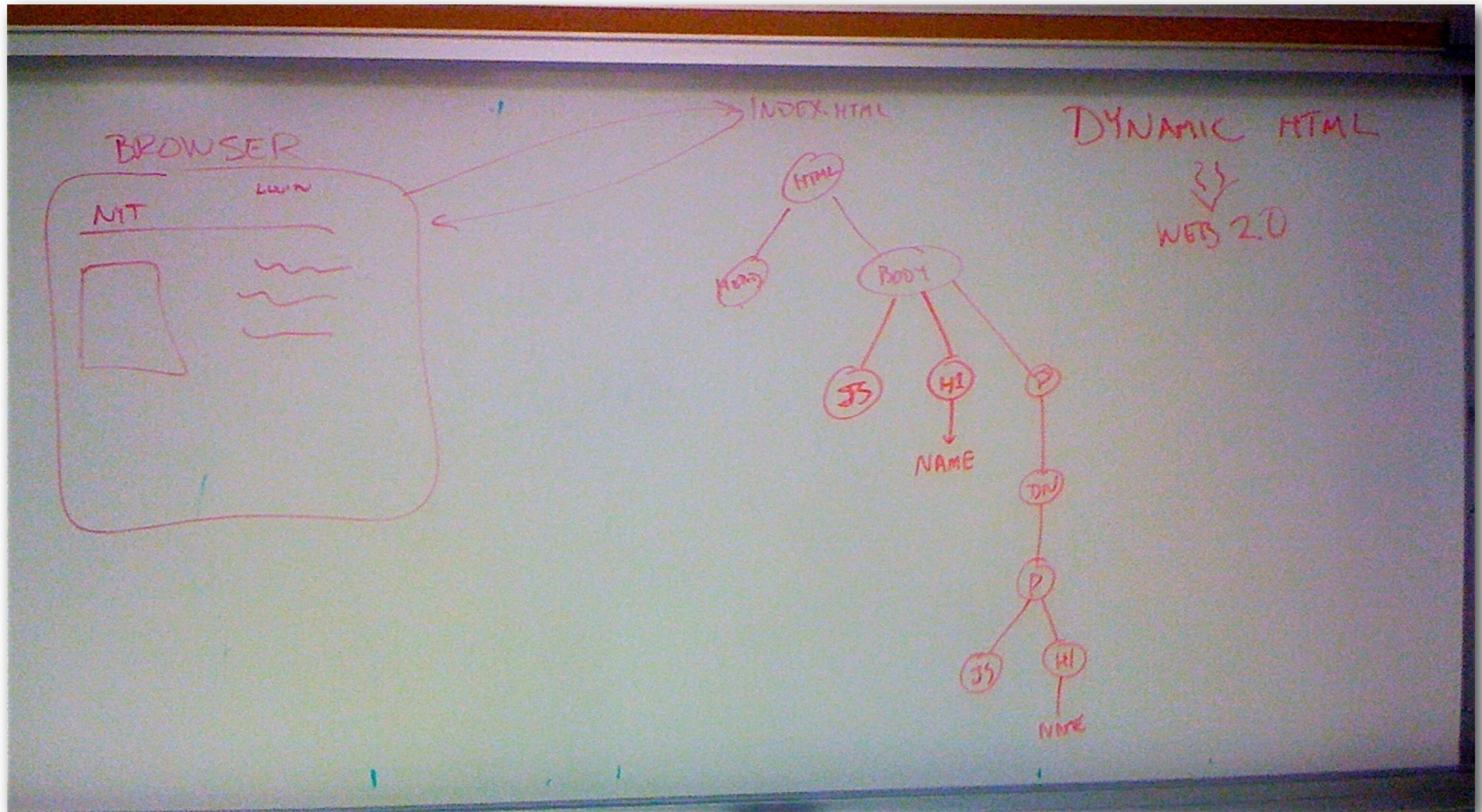
An HTML web page is the data that javascript works with

but

An HTML web page is also where the javascript is stored

and

the web browser is constantly redrawing the HTML (DOM)
as the Javascript changes it.



- Javascript can read and write HTML elements
 - A Javascript can read and change the content of an HTML element
- JavaScript can be used to validate data
 - A JavaScript can be used to validate form data before it is submitted to a server.

- The data structure that is rendered by the browser is called
 - The **DOM**
 - Document Object Model
 - “is a platform- and language-neutral interface that allows programs and scripts to dynamically access and update the content, structure and style of documents. The document can be further processed and the results of that processing can be incorporated back into the presented page.”

- get a Hello World running
 - This eliminates errors related to your hosting provider and web set up
 - It ensures that you have resources necessary on a web host
 - Hopefully this was solved in Assignment 01

```
<html>
  <head>
    <title>Step 1</title>
  </head>
  <body>
    Hello World
  </body>
</html>
```

- Let's put some Javascript in it
 - `<script>` tag
 - encloses javascript code that is run by the browser

```
<html>
  <head>
    <title>Step 2</title>
  </head>
  <body>
    <script type="text/javascript">
      document.write("This is my first JavaScript!");
    </script>
  </body>
</html>
```

```
<html>
  <head>
    <title>Step 3</title>
  </head>
  <body>
    <script type="text/javascript">
      document.write("<font color=\"red\">This is my second JavaScript!</font>");
    </script>
  </body>
</html>
```

- document.write()
 - when this command is run
 - the parameter is inserted into the html document just like it was written there without any javascript
- Compare “View Source” and “Inspect Element”

- JavaScripts in a page will be executed immediately while the page loads into the browser.
- This is not always what we want.
 - Sometimes we want to execute a script when a page loads, or at a later event, such as when a user clicks a button.
- Scripts to be executed when they are called, or when an event is triggered, are placed in functions.
- **TIP:** Put your functions in one place (e.g., the head section), this way they are all in one place, and they do not interfere with page content or confuse you.


```
<html>
  <head>
    <script type="text/javascript">
      function message()
      {
        alert("This alert box was called with the onload event");
      }
    </script>
  </head>

  <body onload="message()">
    Hello World!
  </body>
</html>
```

- Javascripts can be put in the head and the body
- Multiple javascripts are fine

- To reuse javascript in multiple different webpages
 - store it in another file
 - load it externally

```
function message()
{
    alert("This alert box was called from a remote library.");
}
```

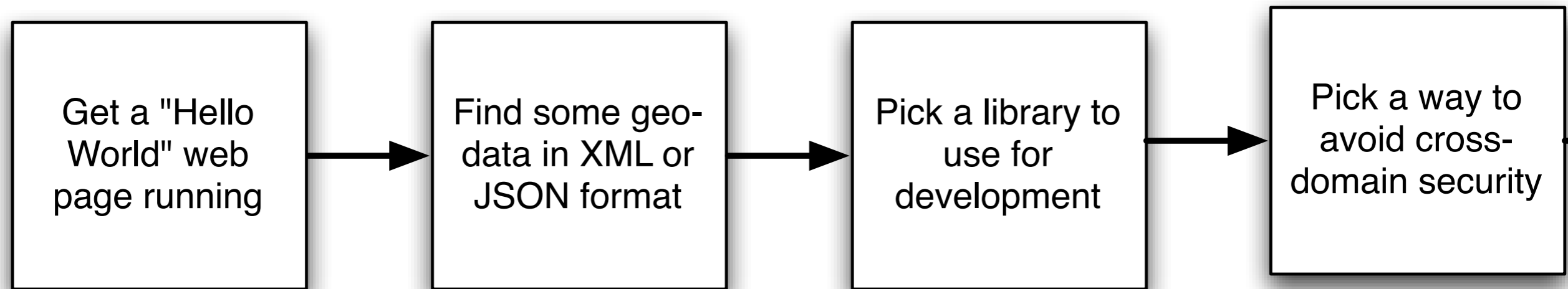
```
<html>
  <head>
    <script type="text/javascript" src="Step5.js"></script>
  </head>

  <body onload="message()">
    Hello World!
  </body>
</html>
```

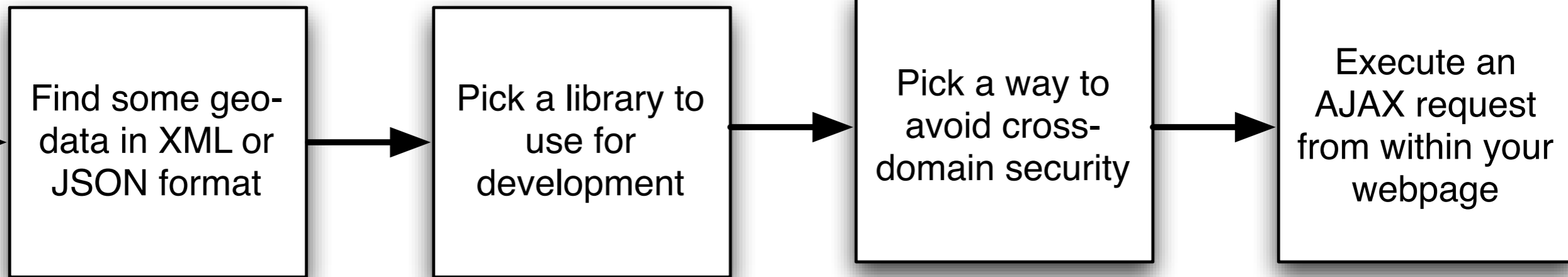
Assignment 4

- The goal is a web page
 - which has issued an AJAX request
 - parsed the data
 - and displayed it in a new way

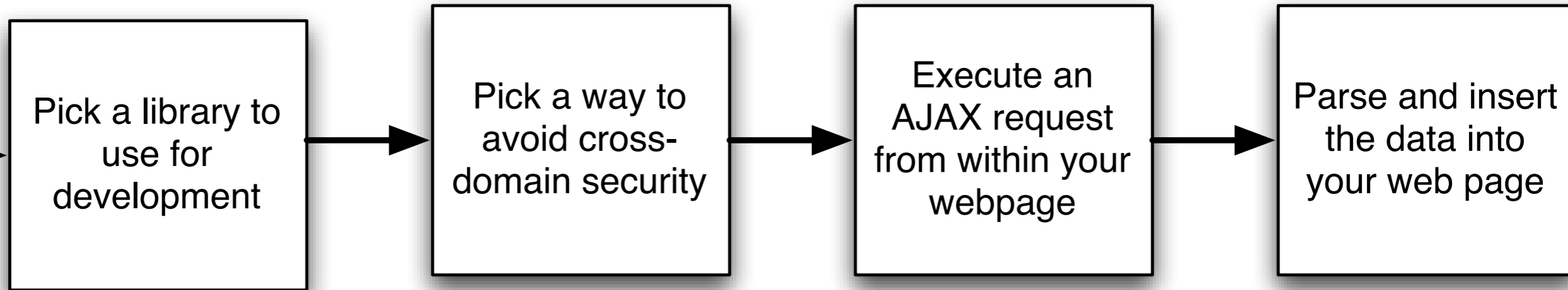
Assignment 4



Assignment 4



Assignment 4



Assignment 4

```
graph LR; A[Pick a way to avoid cross-domain security] --> B[Execute an AJAX request from within your webpage]; B --> C[Parse and insert the data into your web page];
```

Pick a way to avoid cross-domain security

Execute an AJAX request from within your webpage

Parse and insert the data into your web page

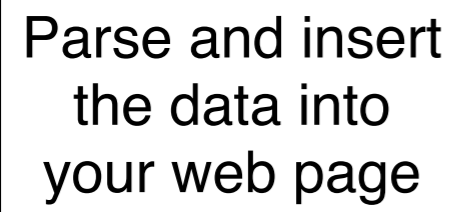
Assignment 4

```
graph LR; A[Execute an AJAX request from within your webpage] --> B[Parse and insert the data into your web page]
```

Execute an
AJAX request
from within your
webpage

Parse and insert
the data into
your web page

Assignment 4



Parse and insert
the data into
your web page

Assignment 4

- Find some geo-data in XML or JSON format
 - (Hint: RSS is a specific type of XML)
- What is geo-data?
 - Anything that relates data to a spot on the earth
 - Data with a latitude and longitude
 - Data with an address
 - Data with a zip code
 - Data with a county
- For example:
 - Photos taken in Los Angeles
 - <http://www.flickr.com/places/United+States/California/Los+Angeles>

Assignment 2

- use
 - jQuery (<http://jquery.com>)

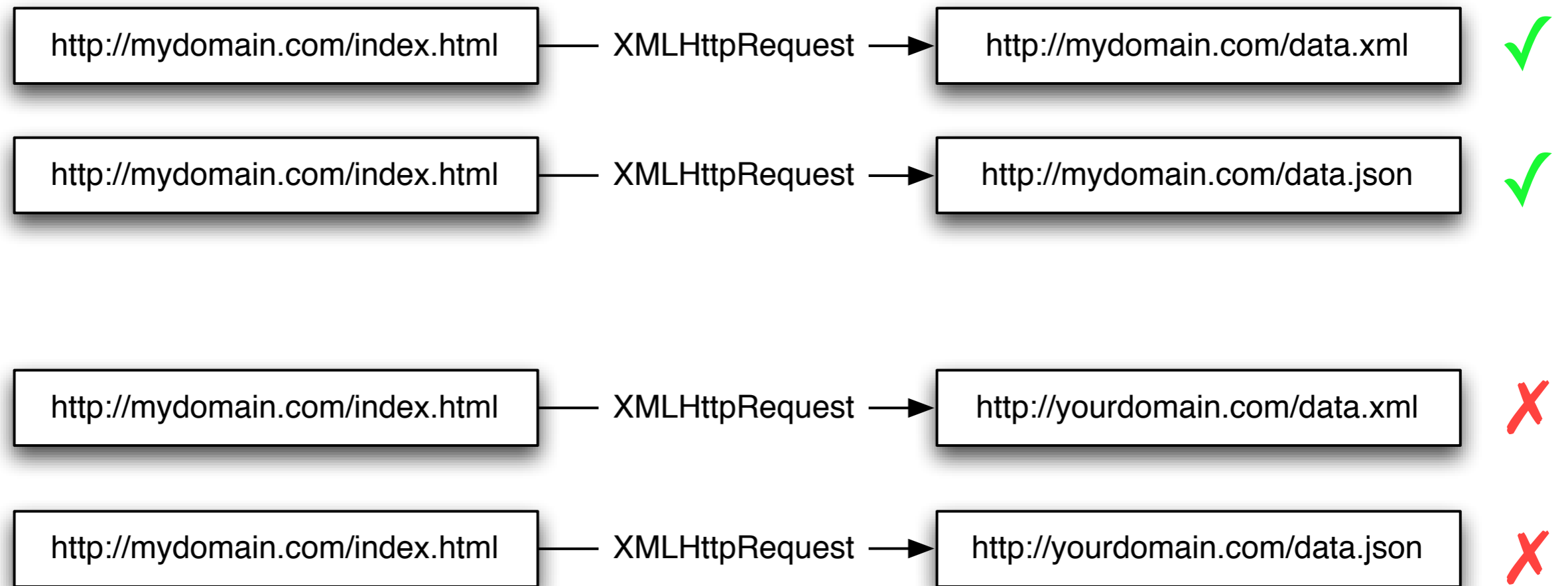
Assignment 4

- At a high-level requesting data asynchronously requires:
 - The location of where you want to get the data from
 - (for us these are the 5 geo-feeds)
 - What function to call when the data is ready
 - Because we aren't waiting
 - aka, "the call back function"
 - The native function call to do this is called
 - "XMLHttpRequest"

Assignment 4

- One problem:
 - Javascript does not allow you to make an XMLHttpRequest from an external domain
 - XMLHttpRequest is the javascript function which retrieves data asynchronously
 - Not just XML, but any data
 - For security reasons it was restricted

Assignment 4



Assignment 4

- Solutions to the cross-domain security restriction
 - Run a “proxy”
 - a php proxy
 - You request
 - <http://mydomain.com/proxy.php?http://yourdomain.com/data.xml>
 - Javascript thinks its coming from local server
 - proxy.php contains something like this code:

Assignment 4

- This is the contents of a file on your server
- It is running a language called php
- the language is interpreted by your web server code

```
<?php
//Get the requested url from our proxy url
$url = $_SERVER['QUERY_STRING'];

// initialize curl with given url
$ch = curl_init($url);

//Tell curl to write the response to a variable
curl_setopt($ch, CURLOPT_RETURNTRANSFER, 1);

//Tell curl to follow any redirects
curl_setopt($ch, CURLOPT_FOLLOWLOCATION, 1);

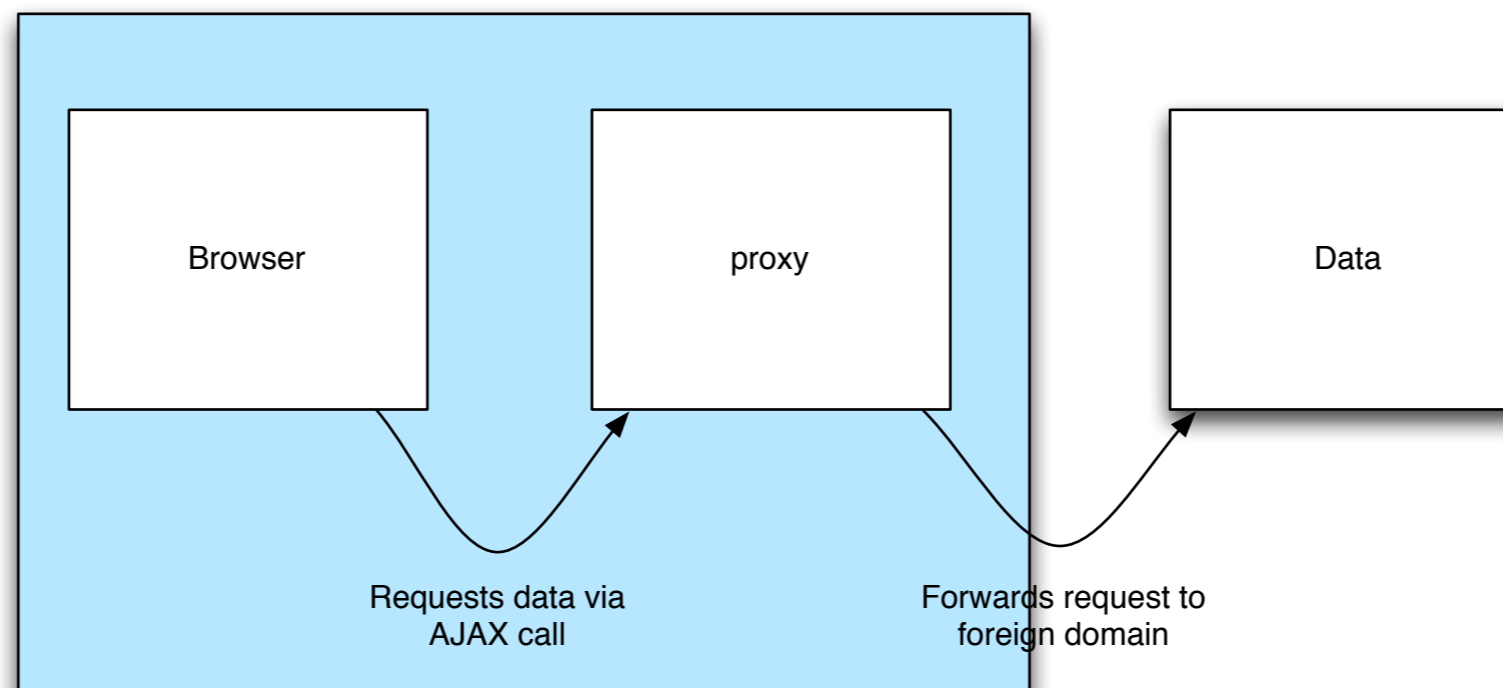
$response = curl_exec($ch);

$cType = curl_getinfo($ch,CURLINFO_CONTENT_TYPE);

//Output the right mime/type
header('Content-type: '.$cType);

//Pass through the data
print $response;

curl_close($ch);
?>
```



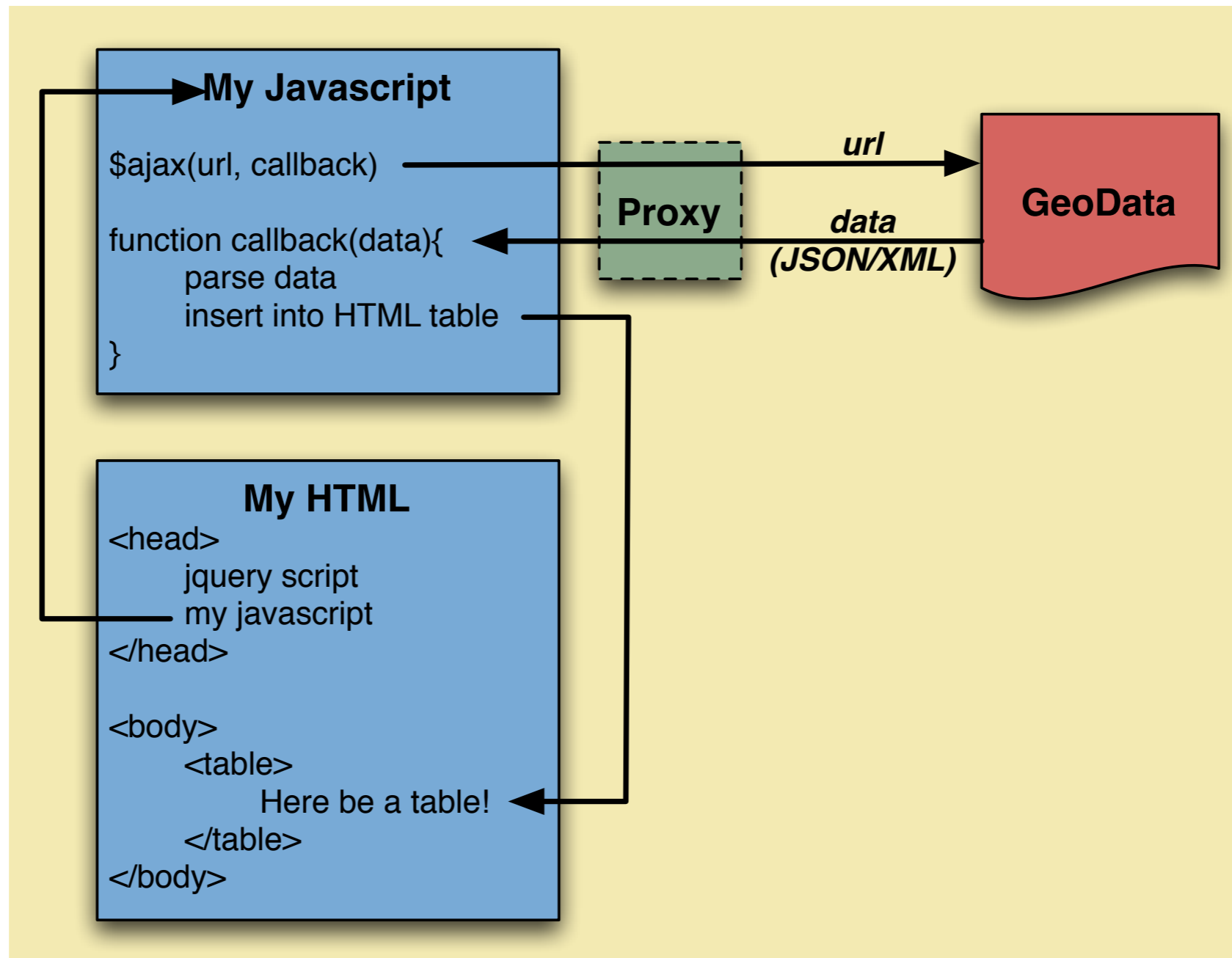
Assignment 4

- Solutions to the cross-domain security restriction
 - Use JSONP
 - Requires server support
 - Yahoo APIs support this
 - Leverages Javascript loophole
 - XMLHttpRequests are restricted
 - Remote Javascript is not

Assignment 4

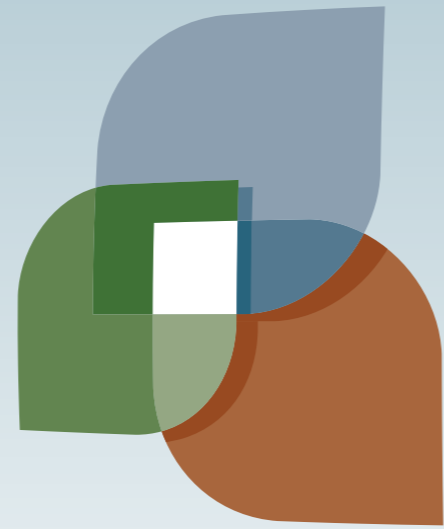
- JSONP adds a `<script src=>` element to your web page with the external URL as the src target
- Getting JSON looks like this:
 - Request: `http://yourdomain.com/data.json`
 - Return: `{"hello":"world"}`
- Getting JSONP looks like this:
 - Request `http://yourdomain.com/data.jsonp?callback=myCallback`
 - Return: `myCallback("{\"hello\":\"world\"}')`
- Your webpage writes a function called `myCallback` to deal with the data

Assignment 4



Assignment 4

- Security issue
 - You are running server generated code on your machine
 - !



L U C I

