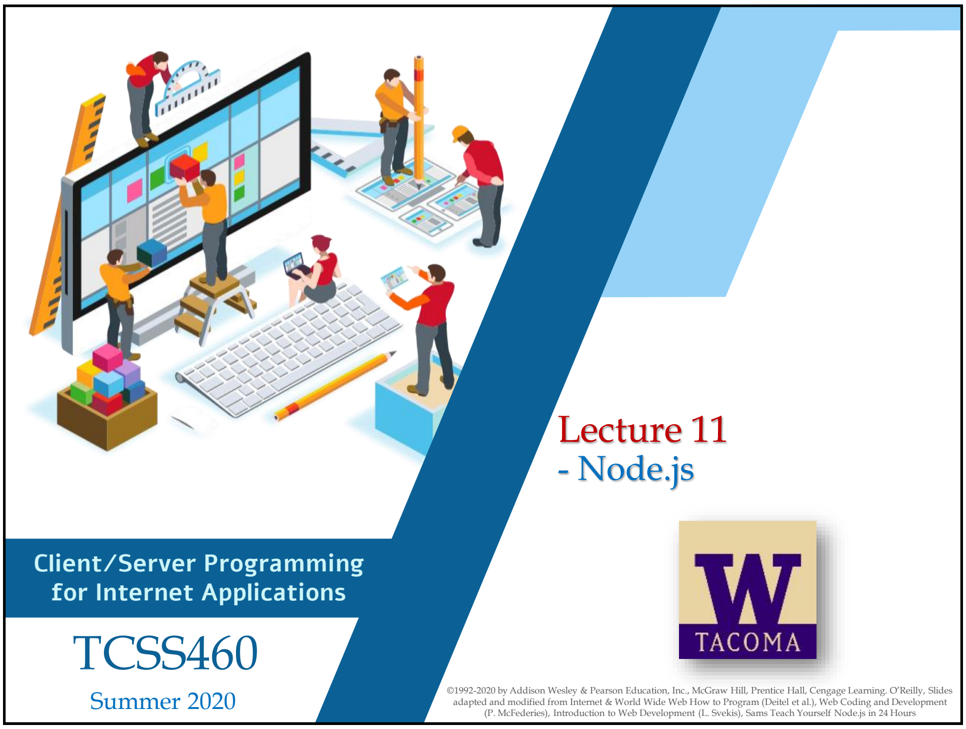
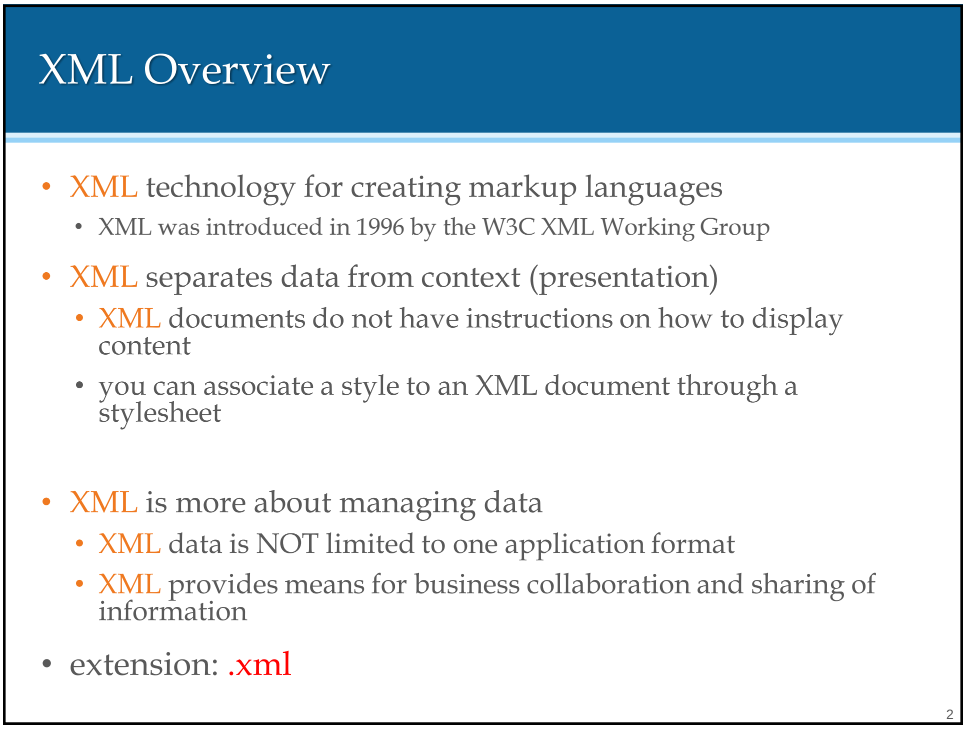


Lecture 11
- Node.js

Client/Server Programming for Internet Applications

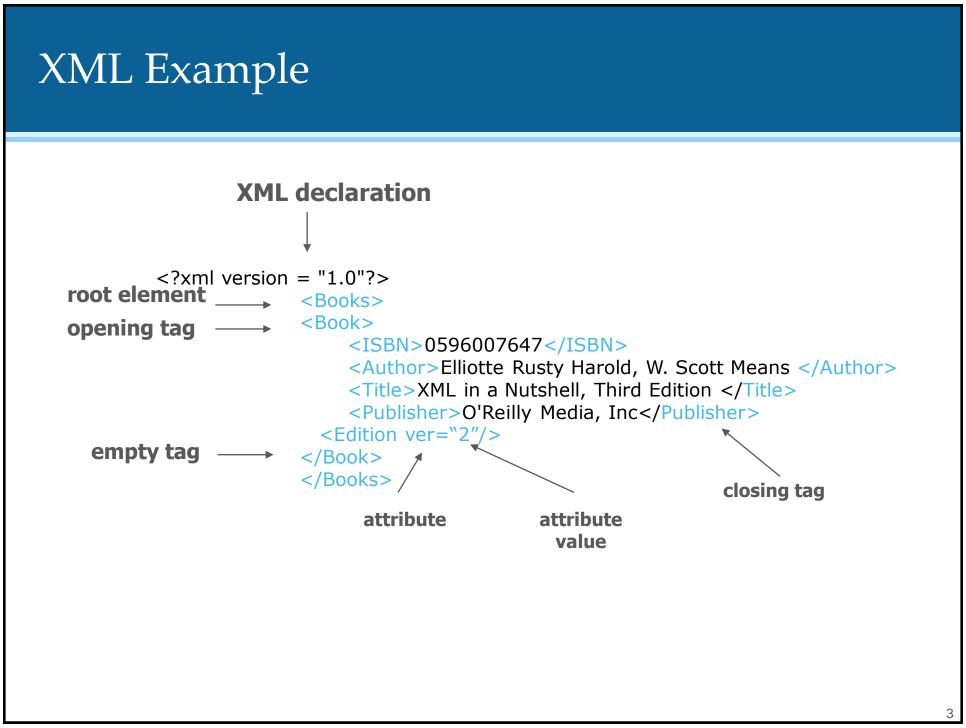
TCSS460

Summer 2020



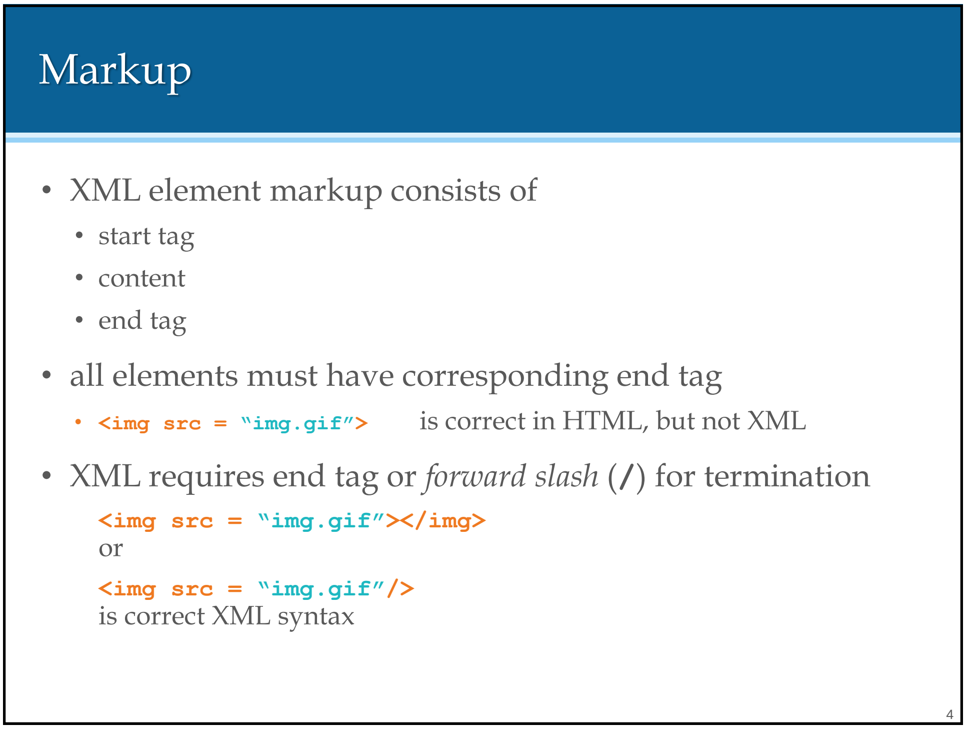
XML Overview

- XML technology for creating markup languages
  - XML was introduced in 1996 by the W3C XML Working Group
- XML separates data from context (presentation)
  - XML documents do not have instructions on how to display content
  - you can associate a style to an XML document through a stylesheet
- XML is more about managing data
  - XML data is NOT limited to one application format
  - XML provides means for business collaboration and sharing of information
- extension: .xml



XML Example

```
   <?xml version = "1.0"?>
         <Books>
         <Book>
             <ISBN>0596007647</ISBN>
             <Author>Elliotte Rusty Harold, W. Scott Means </Author>
             <Title>XML in a Nutshell, Third Edition </Title>
             <Publisher>O'Reilly Media, Inc</Publisher>
           <Edition ver="2"/>
         </Book>
         </Books>
```



Markup

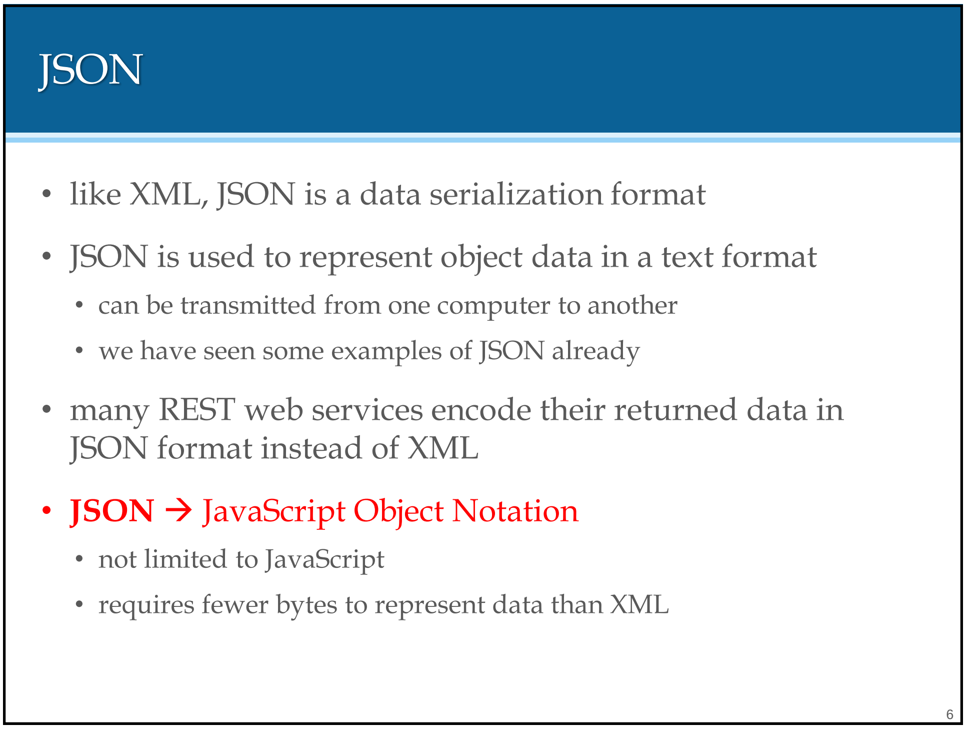
- XML element markup consists of
  - start tag
  - content
  - end tag
- all elements must have corresponding end tag
  - `<img src = "img.gif">` is correct in HTML, but not XML
- XML requires end tag or *forward slash* (**/**) for termination

  `<img src = "img.gif"></img>`
  or

  `<img src = "img.gif"/>`
  is correct XML syntax

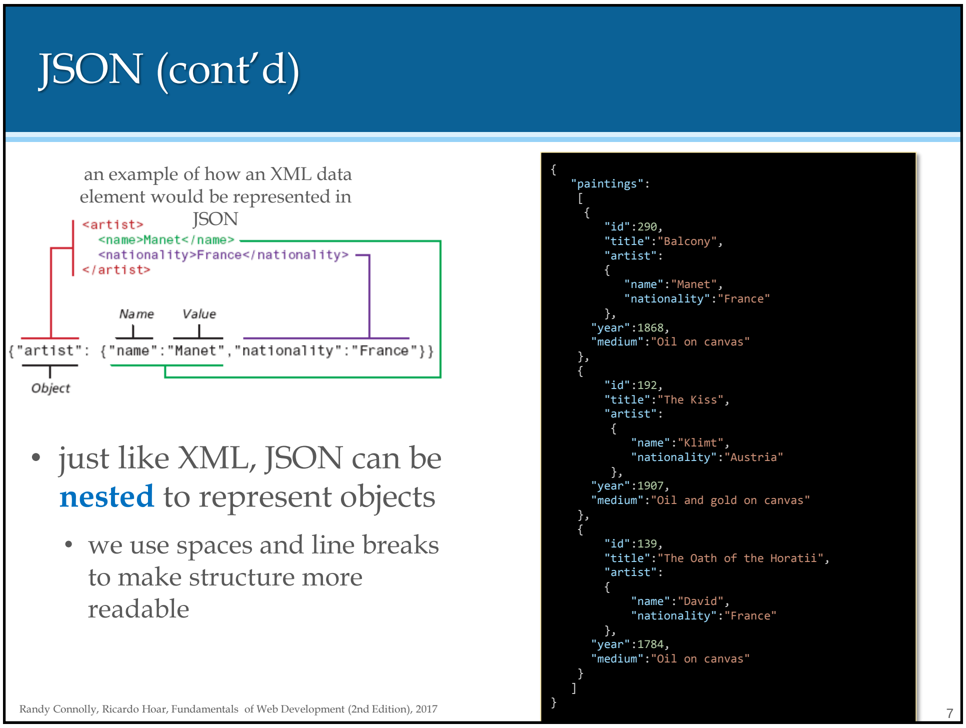
JSON

JavaScript Object Notation



JSON

- like XML, JSON is a data serialization format
- JSON is used to represent object data in a text format
  - can be transmitted from one computer to another
  - we have seen some examples of JSON already
- many REST web services encode their returned data in JSON format instead of XML
- **JSON** → JavaScript Object Notation
  - not limited to JavaScript
  - requires fewer bytes to represent data than XML



JSON (cont'd)

an example of how an XML data element would be represented in JSON

```
<artist>
   <name>Manet</name>
   <nationality>France</nationality>
</artist>
```

```
{"artist": {"name":"Manet","nationality":"France"}}
```

Name
Value
Object

- just like XML, JSON can be **nested** to represent objects
  - we use spaces and line breaks to make structure more readable

```
{
   "paintings":
    [
     {
        "id":290,
        "title":"Balcony",
        "artist":
        {
           "name":"Manet",
           "nationality":"France"
        },
      "year":1868,
      "medium":"Oil on canvas"
    },
    {
        "id":192,
        "title":"The Kiss",
        "artist":
         {
            "name":"Klimt",
            "nationality":"Austria"
         },
      "year":1907,
      "medium":"Oil and gold on canvas"
    },
    {
        "id":139,
        "title":"The Oath of the Horatii",
        "artist":
        {
            "name":"David",
            "nationality":"France"
        },
      "year":1784,
      "medium":"Oil on canvas"
    }
   ]
}
```

Randy Connolly, Ricardo Hoar, Fundamentals of Web Development (2nd Edition), 2017

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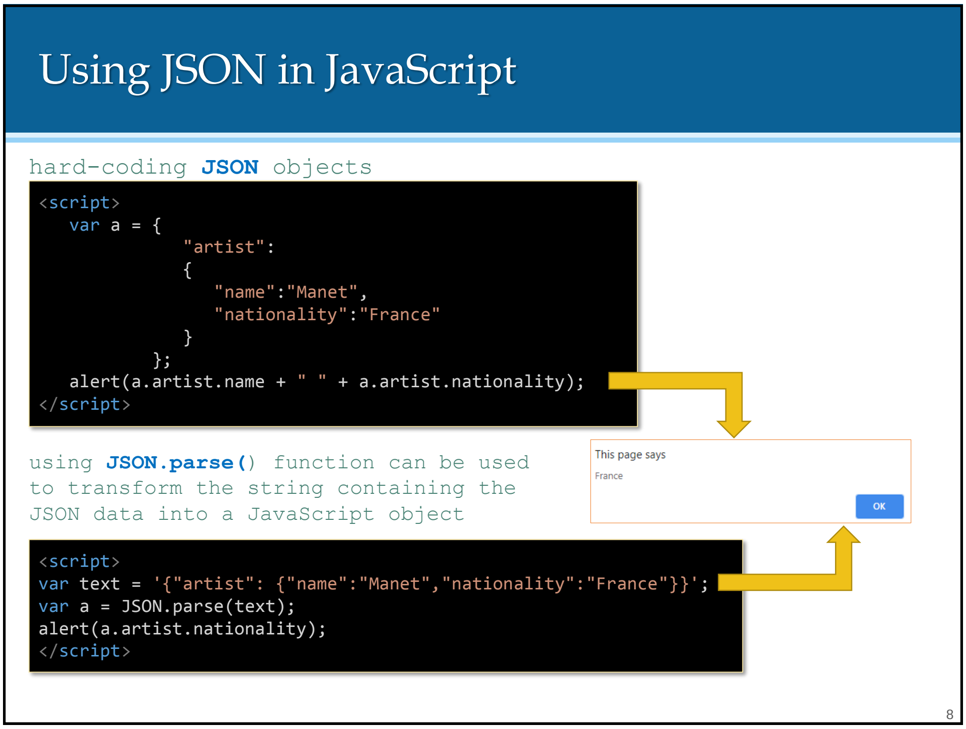

Using JSON in JavaScript

hard-coding **JSON** objects

```
<script>
   var a = {
              "artist":
              {
                 "name":"Manet",
                 "nationality":"France"
              }
           };
   alert(a.artist.name + " " + a.artist.nationality);
</script>
```

This page says

France

using **JSON.parse()** function can be used to transform the string containing the JSON data into a JavaScript object

```
<script>
var text = '{"artist": {"name":"Manet","nationality":"France"}}';
var a = JSON.parse(text);
alert(a.artist.nationality);
</script>
```

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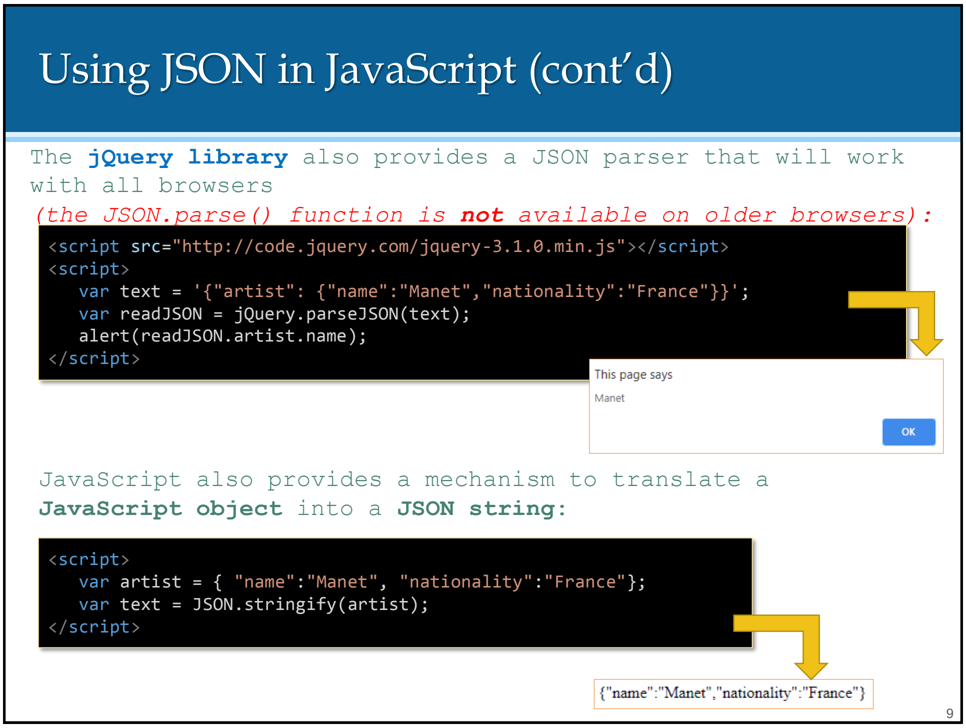

Using JSON in JavaScript (cont'd)

The **jQuery library** also provides a JSON parser that will work with all browsers

*(the JSON.parse() function is **not** available on older browsers):*

```
<script src="http://code.jquery.com/jquery-3.1.0.min.js"></script>
<script>
   var text = '{"artist": {"name":"Manet","nationality":"France"}}';
   var readJSON = jQuery.parseJSON(text);
   alert(readJSON.artist.name);
</script>
```

This page says

Manet

OK

JavaScript also provides a mechanism to translate a **JavaScript object** into a **JSON string:**

```
<script>
   var artist = { "name":"Manet", "nationality":"France"};
   var text = JSON.stringify(artist);
</script>
```

```
{"name":"Manet","nationality":"France"}
```

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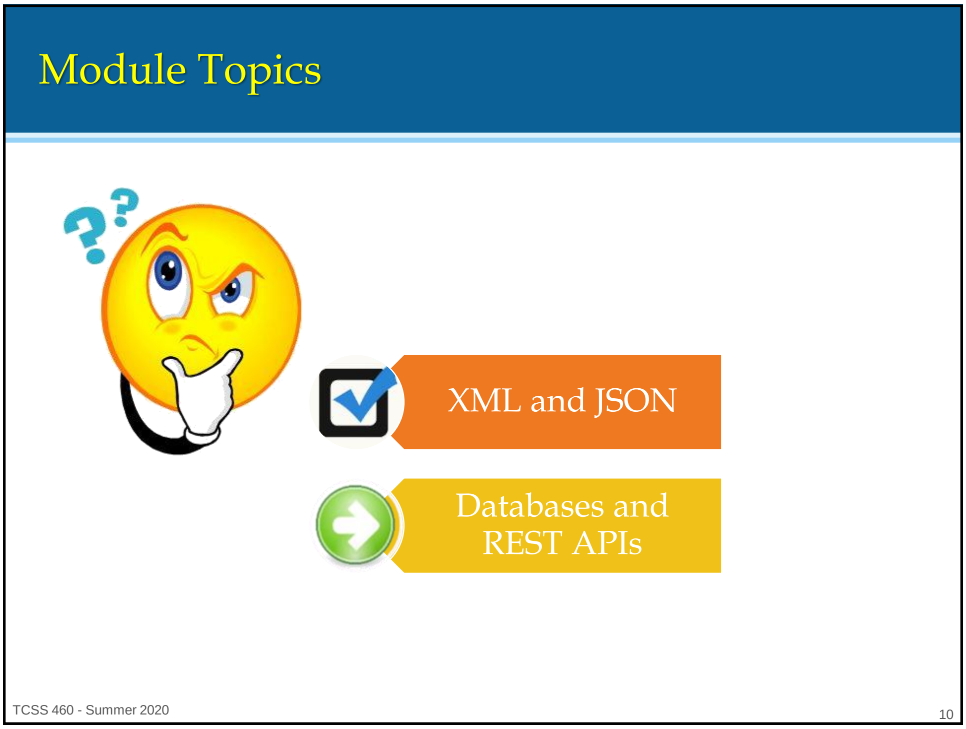

Module Topics

☑ XML and JSON

Databases and REST APIs

TCSS 460 - Summer 2020

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