Computer Science 571 2nd Exam
Prof. Papa
Thursday, December 8, 2016, 6:00pm – 7:20pm

Name: **Student ID Number:**

1. **This is a closed book exam.**
2. **Please answer all questions on the test**

JSON Question [10 pts]

The REST Flickr Service includes a "getRecent" API, flickr.photos.getRecent, which returns a list of the latest public photos uploaded to flickr. It is defined as follows:

flickr.photos.getRecent

Returns a list of the latest public photos uploaded to flickr.

Authentication

This method does not require authentication.

Arguments

`api_key` (Required)
Your API application key.

`extras` (Optional)
A comma-delimited list of extra information to fetch for each returned record. Currently supported fields are: `license`, `date_upload`, `date_taken`, `owner_name`, `icon_server`, `original_format`, `last_update`, `geo`, `tags`, `machine_tags`, `o_dims`, `views`, `media`, `path_alias`, `url_sq`, `url_t`, `url_s`, `url_m`, `url_o`

`per_page` (Optional)
Number of photos to return per page. If this argument is omitted, it defaults to 100. The maximum allowed value is 500.

`page` (Optional)
The page of results to return. If this argument is omitted, it defaults to 1.

A sample XML REST call is shown below:

http://api.flickr.com/services/rest/?method=flickr.photos.getRecent&api_key=626cf9c993df85b49d193b9645fd2c0d

When the format is XML (the default), the following is an example of the data returned:

```
<?xml version="1.0" encoding="utf-8" ?>
<rsp stat="ok">
<photos page="1" pages="100" perpage="2" total="200">
     <photo id="4144809437" owner="9755447@N04"
secret="5d5e5dc80e" server="2582" farm="3" title="Big
Springs Monument Talladega" ispublic="1" isfriend="0"
isfamily="0" />
     <photo id="4144809495" owner="40432260@N04"
secret="2f3880845a" server="2689" farm="3"
title="IMG_1247" ispublic="1" isfriend="0"
isfamily="0" />

</photos>
</rsp>
```

When the "format=JSON", a JSONP response is returned. A sample JSON REST call is shown below:

A sample XML REST call is shown below:
http://api.flickr.com/services/rest/?method=flickr.photos.getRecent&api_key=626cf9c993df85b49d193b9645fd2c0d&format=json

Please fill in the missing JSON code that duplicates the XML result above:

```
jsonFlickrApi({"photos":{"page":1, "pages":100,
"perpage":2, "total":200,

"photo":[

{"id":"4144809437", "owner":"9755447@N04",
"secret":"5d5e5c80e", "server":"2582", "farm":3,
"title":"Big Spring Monument Talladega", "ispublic":1,
"isfriend":0, "isfamily":0},

{"id":"4144809495", "owner":"40432260@N04",
"secret":"2f3880845a", "server":"2689", "farm":3,
"title":"IMG_1247", "ispublic":1, "isfriend":0,
"isfamily":0}

]
```

```
}, "stat":"ok"})
```

Web Performance Questions [10 pts]

List any 3 rules out of the 14 rules for faster Web pages from Steve Souders that help speed up delivery of HTML.

Speed Up HTML (3 points):

Gzip components

Move scripts to the bottom

Make CSS external

Make JS external

List 3 ways to reduce the number of HTTP requests.

Reduce HTTP requests (3 points):

Any 3 of:

Combine JS Scripts

Combine CSS style sheets

Combine images into image maps

Combine images into "sprites"

List 4 headers that can help to improve caching.

Improve Caching (4 points):

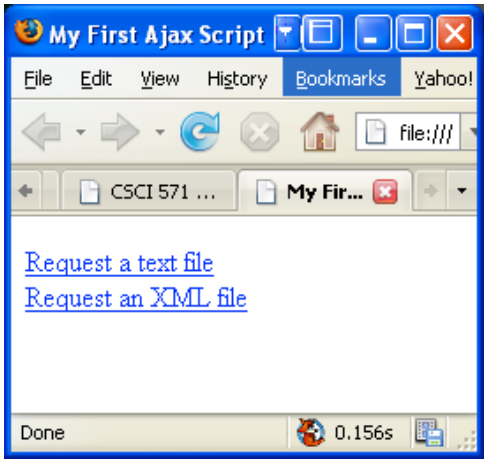
Expires header

Cache-Control header

Last-Modified header

Etag header

JavaScript + AJAX Questions [10 pts]



Below is the source code that generated the web page above. There are two links on the page. The first one causes a text file to be displayed in the page beneath the links. The second link causes an XML file to be displayed in the same place.

```
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN">
<html><head>
      <title>First Ajax Script</title>
      <script src="script01.js" type="text/javascript"
language="Javascript">
      </script>
</head><body>
      <p><a id="makeTextRequest" href="gAddress.txt">Request a
text file</a><br />
      <a id="makeXMLRequest" href="us-states.xml">
Request an XML file</a></p>
      <div id="updateArea"> </div>
</body>
</html>
```

Below is the JavaScript source that was imported into the HTML above, but some of the lines are missing, replaced by XXXXXXXs. Fill in the missing lines on the answer sheet. Each line is worth 1 point.

```
window.onload = initAll;
var xhr = false;

function initAll() {
document.getElementById("makeTextRequest").onclick = getNewFile;
document.getElementById("makeXMLRequest").onclick = getNewFile;}

function getNewFile() {
      makeRequest(this.href);
      return false;}

function makeRequest(url) {
      if (window.XMLHttpRequest) {
            xhr = new XMLHttpRequest();}
      else { if (window.ActiveXObject) {
```

```
            try { xhr = new ActiveXObject("Microsoft.XMLHTTP"); }
                  catch (e) { }
            }   }
      if (xhr) {
            xhr.onreadystatechange = showContents;
            xhr.open("GET", url, true);
            xhr.send(null);  }
      else {
document.getElementById("updateArea").innerHTML = "Sorry, but I
couldn't create an XMLHttpRequest";
    }  }

function showContents() {
      if (xhr.readyState == 4) {
            if (xhr.status == 200) {
                  var outMsg = (
xhr.responseXML && xhr.responseXML.contentType=="text/xml") ?
xhr.responseXML.getElementsByTagName("choices")[0].textContent :
xhr.responseText;
      } else {
           var outMsg = "There was a problem with the request " +
xhr.status; }

document.getElementById("updateArea").innerHTML = outMsg;
} }
```

HTML5 Questions [10 pts]

Each question is worth 2 points. Note that there is no partial credit for any of these questions.

Q1: Name 4 types of video "containers"?

A1: Any 4 of:

MPEG4 (mp4 or m4v)
Quicktime (.mov)
Flash (.flv)
Ogg (.ogv)
WebM
Audio Video Interleave (AVI)

Q2: Which of the following are <u>new</u> in HTML5?

[X] video and audio support
[X] graphics support
[X] local storage
[ ] plugin support
[X] session storage
[ ] SQL support

[X] Geocoding support
[X] Sectioning elements
[X] Forms validation
[X] CSS3 support
[X] Offline Support
[ ] ALL OF THE ABOVE

Q3: What happened to the HTML 4.01 elements and <font> in HTML5?

A3: They have been moved to CSS

Q4: Name 4 Audio Codecs

A4: Any 4 from MP3, AAC, AAC+, VORBIS, FLAC, WAVE

Q5: If you needed to make sure that your video files could be viewed on the large majority of desktop browsers and all mobile devices, what two (2) video containers would you pick?

A5: MPEG4 and WebM

Web Security Questions [10 pts]

Each question is worth 2 points.

Q1: What does the TOR network provide?

A1: A protective layer between the user and the Internet, which 1) encrypts all information and 2) makes the user anonymous.

Q2: What do PGP and S/MIME provide?

A2: Data encryption technology for encrypting and signing e-mails

Q3: What software library is vulnerable to the Heartbleed Bug?

A3: OpenSSL

Q4: What type of attack is Stuxnet?

A4: a worm

Q5: Name one of the most recommended way to generate strong passwords?

A5:

Any one (1) of these:

A) Using a very large number of characters
B) Use Diceware generated passwords
C) Use first letters of a very long phrase

JQuery Questions [10 pts]

Q1: This code is an example of what selector?

```
var elementCount = $("*").css("border", "3px solid red" ).length;
```

A1: The JQuery "All Selector" or "Basic All Selector"

Q2: This code an example of what selector category?

```
$("div:contains('John')").css( "text-decoration", "underline" );
```

A2: A JQuery "Content Filter"

Q3: [This question is worth 6 points] Consider the following example without JQuery:

```
<input id='countTags' type='button' onclick='handleAllTags()'>

function handleAllTags()
  { var arrayOfDocFonts;
    if (document.all || document.getElementById)
     { arrayOfDocFonts = document.getElementsByTagName("font"); }
    else { document.write("Unrecognized Browser Detected"); }
   alert("Number of font tags in this document are " +
arrayOfDocFonts.length + ".");
  }
```

A3: Rewrite it using JQuery.

```
$(function() { // when document is ready
      // when countTags is clicked,
      $("#countTags").click(function() {
            // alert the number of font tags in the HTML
            alert("Number of font tags in this document are " +
$("font").length + ".");

      });
});
```

JavaScript Frameworks Questions [10 pts]

Q1: Name a JavaScript runtime, built on Chrome V8 and that uses an event-driven, non-blocking I/O model?

A1: Node.js

Q2: Complete the missing code in the Angular instantiation below:

```
<script>
var app = angular.module("myApp", []);
app.controller("myController", function($scope,$http) {

    $scope.topic = "CSCI 571";
});
</script>
<body ng-app="myApp" ng-controller="myController">
</body>
```

Q3: Which of the following is true in AngularJS?

[X] A module defines an application
[X] A module is a container for controllers
[X] Controllers always belong to a module
[ ] Filter sorts the rows in the model
[X] ng-repeat works like a for loop
[X] $http holds the HTTP request handler
[ ] ALL OF THE ABOVE

Q4: Which of the following are Angular directives?

[ ] ng-app
[ ] ng-controller
[ ] ng-bind
[ ] ng-init
[ ] ng-model
[ ] ng-class
[ ] ng-repeat
[ ] ng-form
[X] ALL OF THE ABOVE

Q5: What library is this code using and for what kind of layout?

```
<div class="row">
  <div class="col-md-4">.col-md-4</div>
  <div class="col-md-4">.col-md-4</div>
  <div class="col-md-4">.col-md-4</div>
</div
```

A5: Bootstrap library and Grid Layout

Cookies and Privacy Questions [10 pts]

Assuming we already know the elements of a cookie, define the following three terms.

Q1: Define a Session cookie (2 pts)

A1: A cookie that is erased when the user closes the Web browser. The session cookie is stored in temporary memory and is not retained after the browser is closed.

Q2: Define a Persistent cookie (2 pts)

A2: A cookie that is stored on a user's hard drive until it expires (persistent cookies are set with expiration dates) or until the user deletes the cookie.

Q3: Define a Third-party cookie (2 pts)

A3: Third-party cookies originate from (or will be sent to) a Web site that is not the site you are visiting.

Q4: Below are two functions for manipulating cookies, createCookie and readCookie. Some of the code in readCookie has been removed. Complete the missing code. (4 pts)

```
function createCookie(name,value,days) {
        if (days) {
                var date = new Date();
                date.setTime(date.getTime()+(days*24*60*60*1000));
            var expires = "; expires="+date.toGMTString();
      }
      else var expires = "";
      document.cookie = name+"="+value+expires+"; path=/";
}

function readCookie(name) {
      var nameEQ = name + "=";
      var ca = document.cookie.split(';');
      for (var i=0;i < ca.length;i++) {
            var c = ca[i];
            while (c.charAt(0)==' ') c = c.substring(1,c.length);
            if (c.indexOf(nameEQ) == 0) return
c.substring(nameEQ.length,c.length);
      }
      return null;
}

function eraseCookie(name) {
        createCookie(name,"",-1);
}
```

Lynda.com Questions [10 pts]

Q1: What attack is this code an example of?

```
<script>
var user_list = <%= @users.to_json %>;
</script>

email = "fake@email.com\"}; alert('Gotcha!'); //"
```

A1: Cross-Site Scripting

Q2: What attack is this code an example of?

```
<img src="https://bank.com/transfer?amount=1000&to=987654321" />
```

A2: Cross-Site Request Forgery (CSRF)

Q3: What attack is this code an example of?

```
before:

SELECT * FROM users
WHERE username = '${username}' AND Password = '${password}';

username= "jsmith" OR 1 = 1; --"
password = "blank"

after:

SELECT * FROM user
WHERE username = 'jsmith' OR 1 = 1; --' AND Password = 'blank';
```

A3: SQL Injection

Q4: What attack is this code an example of?

```
http://yoursite.com?SESSIONID=AG88HNG96BGF985
```

A4: URL Manipulation

Q5: What does the following code represent?

```
media="screen and (min-width: 960px), screen and (orientation: landscape"
```

A5: A media query

Secure Web Communication (Web Server Performance) Questions [10 pts]

Each question is worth 2 points. <u>There is no partial credit.</u>

Q1: In Public Key Encryption, who generates the keys used for "privacy"?

A1: The Receiver

Q2: Why the RSA algorithm cannot be used for encrypting data on Web?
A2: Because it is too slow, as it involves complex mathematical calculations involving prime number ("slow" is enough)

Q3: List one of the major difference between a "bulk cypher" and RSA?

A3: 1) Bulk cyphers use the same key for encrypt/decript –OR- 2) bulk cyphers are fast

Q4: List two well-known cryptographic hash functions

A4: Any 2 of MD5, SHA-1 or SHA-2

Q5: Complete the following statements. In SSL,

Authentication of both parties is done using "Digital Certificates"

Message integrity is accomplished using "Message Digests"