Fall 2014

WEB VISUALIZATIONS DOCUMENTATION: HIGHCHARTS LIBRARY

Languages Covered: HTML, Javascript, jQuery, JSON

Color Legend

	Successful Executions
	In Progress
	Inquiry

First experiemented with replicating the line graph from Highcharts:
http://jsfiddle.net/gh/get/jquery/1.9.1/highslide-
software/highcharts.com/tree/master/samples/highcharts/demo/line-basic/.

Replaced hard-coded data values with arrays by hard-coding the data by declaring the arrays
prior to the function:
Source: http://learn.jquery.com/javascript-101/arrays/

```
  <script type='text/javascript' src='//code.jquery.com/jquery-1.9.1.js'></script>
  <script src="http://ajax.googleapis.com/ajax/libs/jquery/1.11.1/jquery.min.js"></script>
<script type='text/javascript'>//<![CDATA[

var myArray1 = new Array(7.0, 6.9, 9.5, 14.5, 18.2, 21.5, 25.2, 26.5, 23.3, 18.3, 13.9, 9.6);
var myArray2 = new Array(-0.2, 0.8, 5.7, 11.3, 17.0, 22.0, 24.8, 24.1, 20.1, 14.1, 8.6, 2.5);
var myArray3 = new Array(-0.9, 0.6, 3.5, 8.4, 13.5, 17.0, 18.6, 17.9, 14.3, 9.0, 3.9, 1.0);
var myArray4 = new Array(3.9, 4.2, 5.7, 8.5, 11.9, 15.2, 17.0, 16.6, 14.2, 10.3, 6.6, 4.8);

$(function () {
    $('#container').highcharts({
        title: {
            text: 'Monthly Average Temperature (edited)'
```

```
        },
        series: [{
            name: 'Tokyo',
            data: myArray1
        }, {
            name: 'New York',
            data: myArray2
        }, {
            name: 'Berlin',
            data: myArray3
        }, {
            name: 'London',
            data: myArray4
        }]
    }).
```

Parsing CSV files; storing the data in a csv file to avoid hardcoding altogether

> *Source:* http://papaparse.com/

***ALL CSV FILES SHOULD BE STORED IN THE SAME DIRECTORY AS THE HTML FILE

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Different JSON Formats:
Used converter: http://shancarter.github.io/mr-data-converter/

CSV Format
```
NAMEVALUE       COLOR       DATE
Alan   12       blue    Sep. 25, 2009
Shan   13       "green blue"   Sep. 27, 2009
John   45       orange Sep. 29, 2009
Minna 27        teal    Sep. 30, 2009
```

Column Arrays
```
{
  "NAME":["Alan","Shan","John","Minna"],
  "VALUE":[12,13,45,27],
  "COLOR":["blue","green\tblue","orange","teal"],
  "DATE":["Sep. 25, 2009","Sep. 27, 2009","Sep. 29, 2009","Sep. 30, 2009"]
}
```

Row Arrays (works!)
```
[
  ["Alan",12,"blue","Sep. 25, 2009"],
  ["Shan",13,"green\tblue","Sep. 27, 2009"],
  ["John",45,"orange","Sep. 29, 2009"],
  ["Minna",27,"teal","Sep. 30, 2009"]
]
```

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Online JSON Parsers:
http://chris.photobooks.com/json/
http://visualizer.json2html.com/
http://jsonmate.com/

CSV ←→ JSON Converters

   (1) http://www.convertcsv.com/csv-to-json.htm
   (2) http://jsfiddle.net/sturtevant/AZFvQ/
   (3) http://shancarter.github.io/mr-data-converter/

(4) JSON → JSON Array: http://jsonformatter.curiousconcept.com/

Method I used was to use a JSON array

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Javascript Documentation

LINKS USED:

getJSON(): http://api.jquery.com/jquery.getjson/
appendTo(): http://api.jquery.com/appendto/
join(): http://www.w3schools.com/jsref/jsref_join.asp
Ajax and getJSON: http://www.electrictoolbox.com/jquery-load-json-data/
Series: http://api.highcharts.com/highcharts#series
Setting Options: http://www.highcharts.com/docs/getting-started/how-to-set-options
Chart: http://api.highcharts.com/highcharts#Highcharts.Chart
Series.data: http://api.highcharts.com/highcharts#series.data
Javascript Arrays: http://www.w3schools.com/js/js_arrays.asp
Data Labels: http://www.highcharts.com/demo/line-labels
Stacked Bar Chart: http://www.highcharts.com/demo/bar-stacked
Chart tools: http://api.highcharts.com/highcharts#chart
Chart Margins: http://jsfiddle.net/gh/get/jquery/1.7.2/highslide-
software/highcharts.com/tree/master/samples/highcharts/legend/verticalalign/
Legend: http://api.highcharts.com/highcharts#legend
X-axis: http://api.highcharts.com/highcharts#xAxis
Y-axis: http://api.highcharts.com/highcharts#yAxis
Plot Options: http://api.highcharts.com/highcharts#plotOptions

Y-axis Labels: http://api.highcharts.com/highcharts#yAxis.labels

Modularizing HTML, Javascript Code
Create 2 separate files: HTML and Javascript (with jquery)

W3schools:
Script Tag: http://www.w3schools.com/tags/att_script_src.asp
Split Tag: http://www.w3schools.com/jsref/jsref_split.asp

        - split() → split an array into a string of substrings, and returns new array
Push method: http://www.w3schools.com/jsref/jsref_push.asp
        - push() → adds new items to an array, and returns the new length

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HTML Documentation

Drop Down Boxes:
      Highcharts: http://www.highcharts.com/docs/chart-design-and-style/design-and-style
      w3schools: http://www.w3schools.com/html/tryit.asp?filename=tryhtml_select2
      Select tag: http://www.w3schools.com/tags/tag_select.asp

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Highcharts Processing Data:
http://www.highcharts.com/docs/working-with-data/preprocessing
http://www.highcharts.com/docs/working-with-data/preprocessing-data-from-a-file-csv-xml-json
JSON: http://www.highcharts.com/docs/working-with-data/preprocessing-data-from-a-file-csv-xml-json#3
Cross Domain Data:
http://www.highcharts.com/docs/working-with-data/getting-data-across-domains-jsonp
      - make sure pure .json files are saved in the same directory as the HTML file

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Creating CSV Parsing Function

Highcharts: http://www.highcharts.com/docs/working-with-data/preprocessing-data-from-a-file-csv-xml-json

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Ajax Documentation

From w3schools.com: http://www.w3schools.com/ajax/default.asp

Ajax: Asynchronous Javascript and XML
Create an XMLHttpRequest Object
      - exchange data with a server
      - open() and send()

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Conceptual Idea of JSON

Main page: http://www.json.org/index.html
JSON Homepage: http://www.json.com/
From w3schools.com: http://www.w3schools.com/json/default.asp

- JSON arrays – the format that my CSV files are in
- Extension: .json
- name-value pairs
- curly braces hold objects
- square brackets hold arrays

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Creating JSON Function

Explicit JSON declaration:
http://codeinjs.blogspot.com/2013/07/preprocess-json-data-to-use-in.html

(Partway there)
W3schools: http://www.w3schools.com/jquery/ajax_getjson.asp
Stack Overflow: http://stackoverflow.com/questions/18822923/retrieving-json-data-for-highcharts-with-multiple-series → Success!

Highcharts Resources:
(Did not try) http://jsfiddle.net/5pjha/
(Did not try) http://jsfiddle.net/qmacro/NJMyD/

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Enhancing the Visualizations

Drilldown:
        - Highcharts: http://www.highcharts.com/demo/column-drilldown
        - {} → denote an object in javascript
        - [] → denote an array in javascript
        - $.map function: http://api.jquery.com/jquery.map/
        - indexOf: http://www.w3schools.com/jsref/jsref_indexof.asp
        - split: http://www.w3schools.com/jsref/jsref_split.asp
        - match: http://www.w3schools.com/jsref/jsref_match.asp
        - Drilldown documentation: http://api.highcharts.com/highcharts#drilldown
        - Javascript Highcharts Library: "drilldown.js" file
        - Series documentation: http://api.highcharts.com/highcharts#series
        - dataLabels: http://jsfiddle.net/gh/get/jquery/1.7.2/highslide-software/highcharts.com/tree/master/samples/highcharts/point/datalabels/
            - series.data.y: http://api.highcharts.com/highcharts#series.data.y

Example Drilldown: (I used)
Documentation: http://www.highcharts.com/docs/chart-concepts/drilldown

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JSFiddle: http://jsfiddle.net/gh/get/jquery/1.7.2/highslide-software/highcharts.com/tree/master/samples/highcharts/drilldown/basic/

Arrays: http://www.w3schools.com/js/js_arrays.asp
Multi-Dimensional Arrays: http://stackoverflow.com/questions/966225/how-can-i-create-a-two-dimensional-array-in-javascript

Combination Graph: Superimposing multiple plots on the same graph window
Documentation: http://www.highcharts.com/docs/chart-and-series-types/combining-chart-types
Highcharts Demo: http://www.highcharts.com/demo/combo
JSFiddle: http://jsfiddle.net/gh/get/jquery/1.9.1/highslide-software/highcharts.com/tree/master/samples/highcharts/demo/combo/

2 Graphs on a page: Individual Plots on the same Webpage
JSFiddle: http://jsfiddle.net/yw4Vh/

Loading Multiple CSV Files onto the same chart
Stack Overflow: http://stackoverflow.com/questions/15918532/load-multiple-csv-files-correct-order-in-one-chart

StackOverflow: http://stackoverflow.com/questions/17078277/how-do-i-get-two-highcharts-on-one-page
JS Fiddle: http://jsfiddle.net/engemasa/7cvCX/

***Advanced
Area Graph: http://jsfiddle.net/bCU2E/2/
Highcharts Demo: http://www.script-tutorials.com/highcharts-deeper-practice-for-real-statistics/

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Further Exploration

Drilldown with Line Chart:
Stack Overflow: http://stackoverflow.com/questions/15130503/drill-down-function-in-highcharts-in-case-of-line-charts
JSFiddle: http://jsfiddle.net/mv9FV/6/

Drilldown with Bar Chart: (not tried yet)

Example 1:
Stack Overflow: http://stackoverflow.com/questions/13364455/highcharts-drilldown-from-a-series
JSFiddle: http://jsfiddle.net/MuydK/

Example 2:
Stack Overflow: http://stackoverflow.com/questions/13364455/highcharts-drilldown-from-a-series
JSFiddle: http://jsfiddle.net/zaheerahmed/7xEhW/

Example 3:
Stack Overflow: http://stackoverflow.com/questions/12084123/stacked-column-inside-drilldown-highcharts
JSFiddle: http://jsfiddle.net/QnVPE/5/

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Work in Progress:

Database Connection in Highcharts
PHP-MySQL connection: http://www.highcharts.com/docs/working-with-data/preprocessing-data-from-a-database

Heat Maps
http://jsfiddle.net/gh/get/jquery/1.9.1/highslide-software/highcharts.com/tree/master/samples/highcharts/demo/heatmap/
Documentation: http://api.highcharts.com/highmaps#plotOptions.heatmap
http://www.highcharts.com/docs/chart-and-series-types/heatmap
Extended Heat Map: http://jsfiddle.net/gh/get/jquery/1.9.1/highslide-software/highcharts.com/tree/master/samples/highcharts/demo/heatmap-canvas/

ParseInt() → https://developer.mozilla.org/en-US/docs/Web/JavaScript/Reference/Global_Objects/parseInt

http://jeromenicholas.blogspot.com/2012/06/highcharts-reading-from-csv-file.html

http://stackoverflow.com/questions/9665188/how-to-import-an-two-values-array-to-highcharts-from-csv-file

TRY THIS! http://stackoverflow.com/questions/14816749/how-do-i-select-which-columns-from-my-csv-to-chart-with-highchart

Additional CSV Reader
http://jsfiddle.net/W8fME/266/

Further JSON Import Links
http://blueflame-software.com/blog/how-to-create-dynamic-x-axis-data-using-json/

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Further Steps

Highcharts Data Plugins: http://www.highcharts.com/plugin-registry
Export Data to a CSV: http://www.highcharts.com/plugin-registry/single/7/Export-CSV
Moveable Legend: http://jsfiddle.net/jlbriggs/bA6UM/
Insert Months (x-axis): http://jsfiddle.net/jugal/vYK7H/
Normalizing Data: http://jsfiddle.net/DUYjt/1/
Loading JSON in Java: http://karanbalkar.com/2014/06/populate-highcharts-with-json-data-using-jquery/
Loading JSON in MySQL: http://blueflame-software.com/blog/how-to-load-mysql-results-to-highcharts-using-json/

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Further Resources

TutorialsPoint: http://www.tutorialspoint.com/json/

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