dojo.Patterns

(for Lovers of JavaScript)

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Dojo Toolkit Project Lead
jsconf 2009 - Apr 24, 25

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Me.

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The History of Dojo

(cliffnotes version)

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Alex Russell

“netwindows”

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A Foundation.

A Team.

dojo.workers()

Dylan Schiemann
Co-founder
SitePen, Inc.

location: Gilbert, AZ
website: http://dylanschiemann.com/

aliases: "dylan" "dylanks"

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What is Dojo?

- A JavaScript Toolkit
  - Light-weight Base (6k - 26k)
    - ~30k in 1.4 (plugd)
  - Use at will Library

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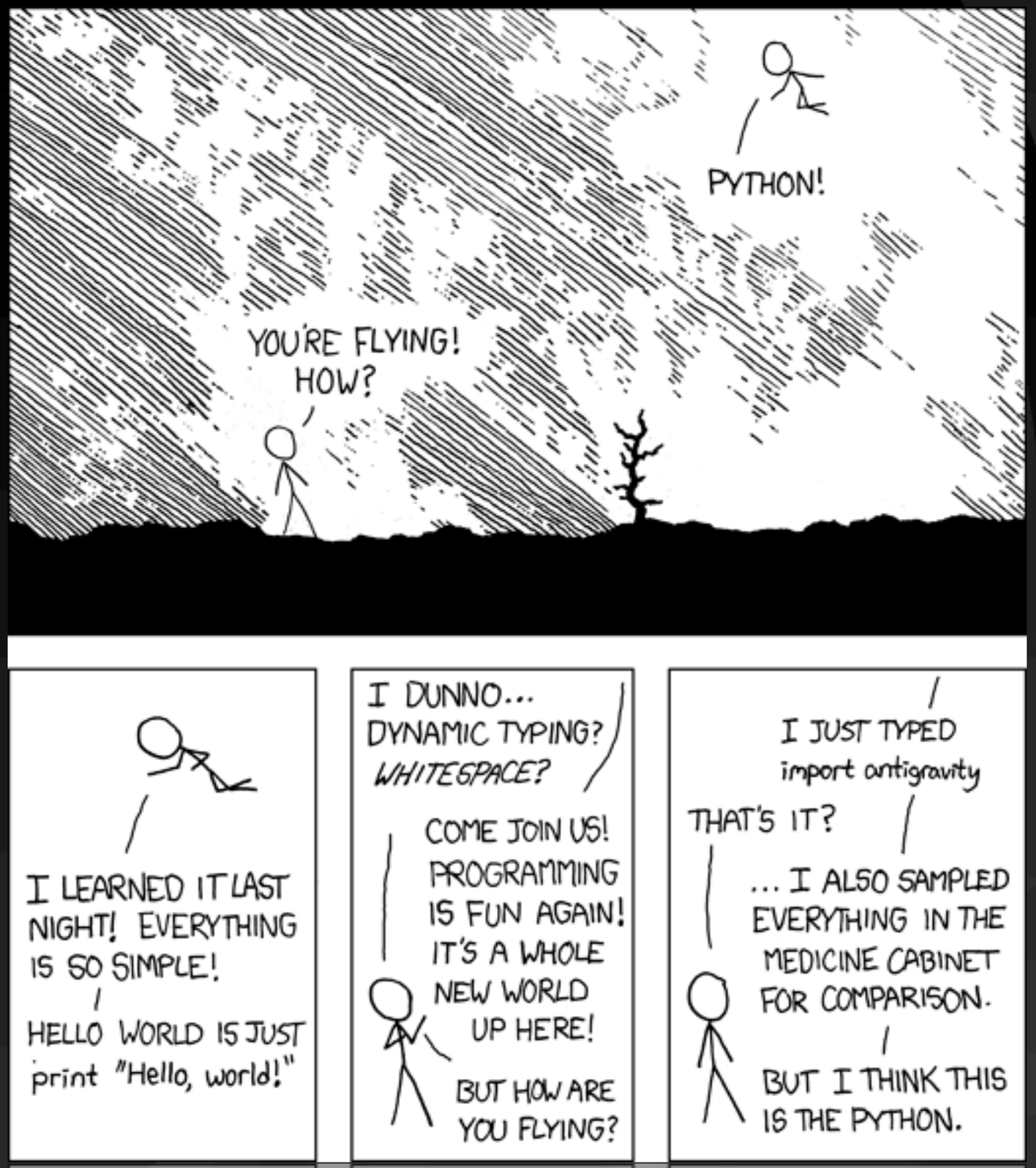
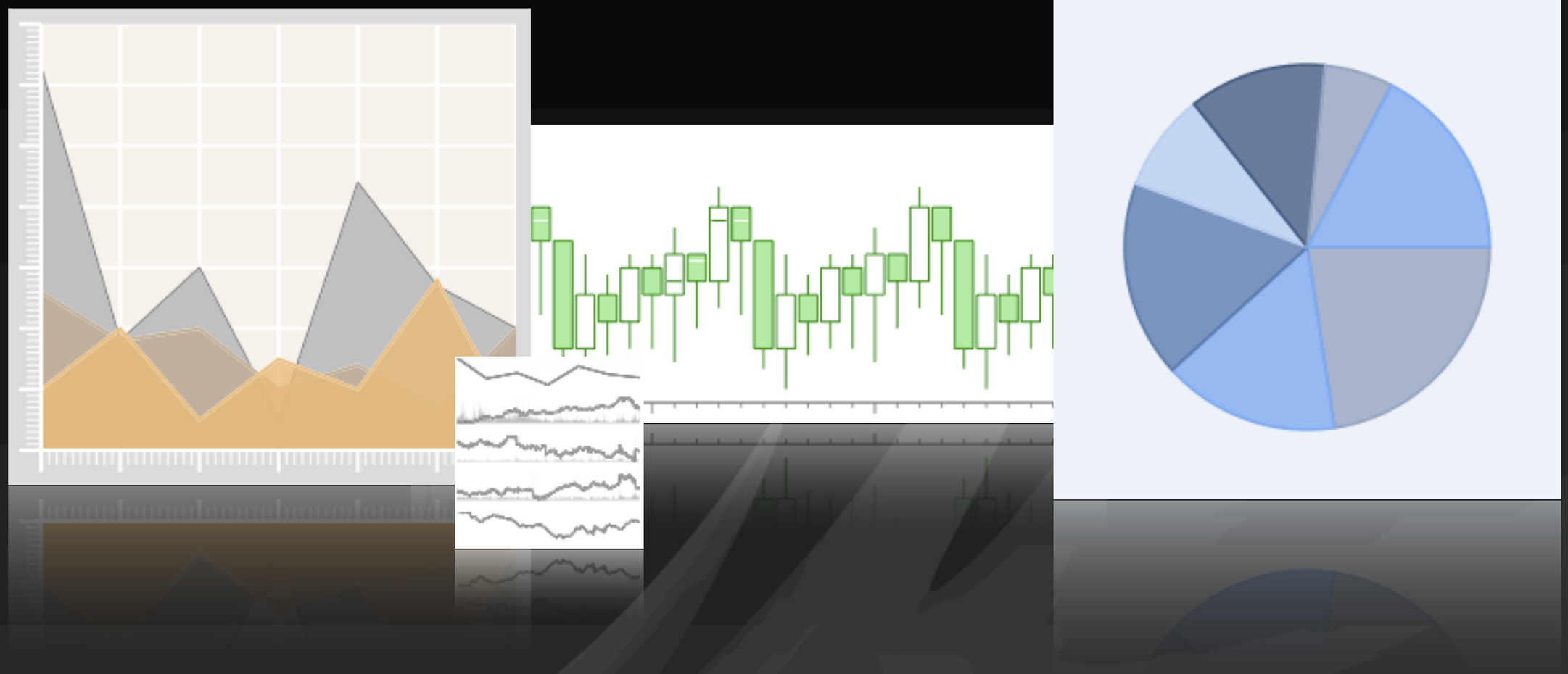


http://xkcd.com/353

Charts?



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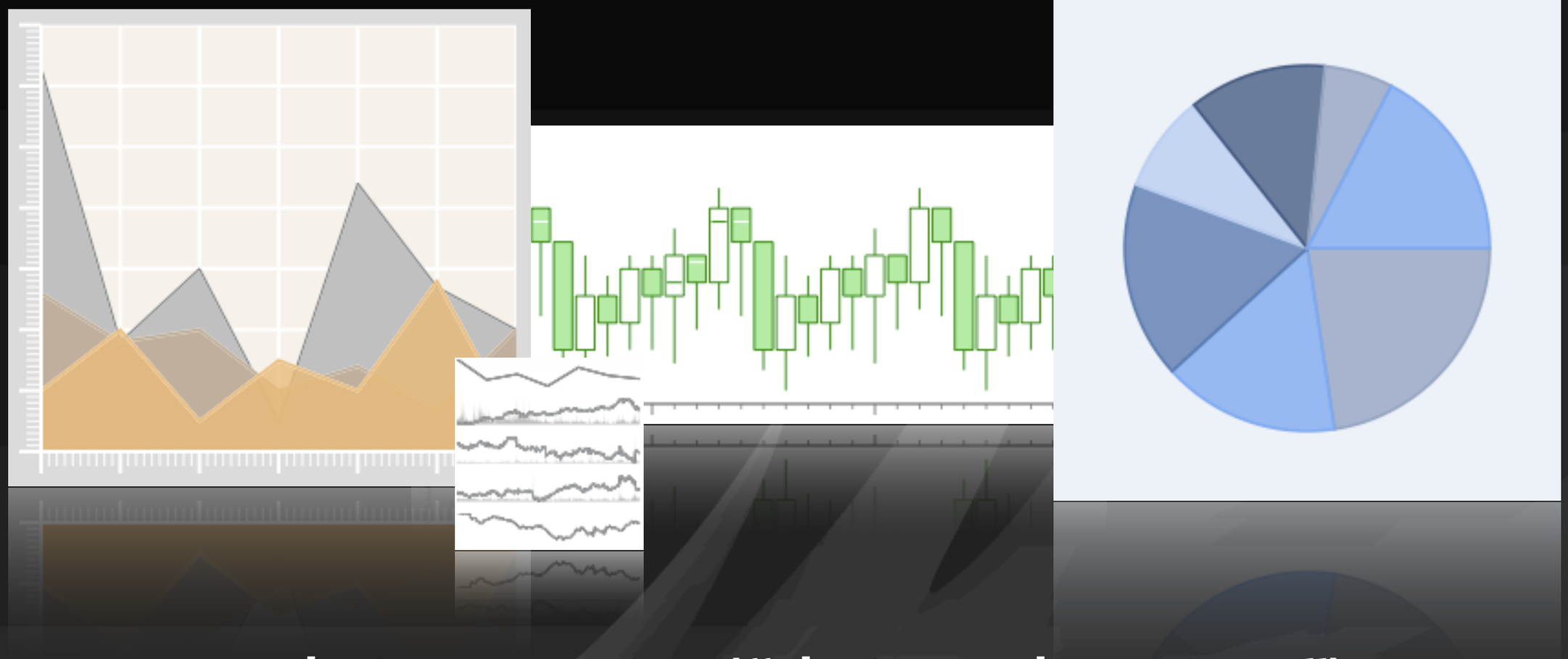
Charts?



dojo.require(“dojox.charting”)

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Calendars?

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Calendars?

dojo.require(“dijit.form.DateTextBox”)

File Uploads?

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File Uploads?

dojo.require(“dojox.form.FileUpload”)

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Syntax Highlighting?

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Syntax Highlighting?

dojo.require(“dojox.highlight”)

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... On and On

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... On and On

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It adds up.

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Dojo Build System

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All-in-One

- Works transparently with Package System
- Group modules into ‘layers’
- Concatenate CSS @import into ‘layers’
- Layer & File minification
  - Comments, Whitespace, newlines ...
- stripConsole (console.warn, .log, .error)

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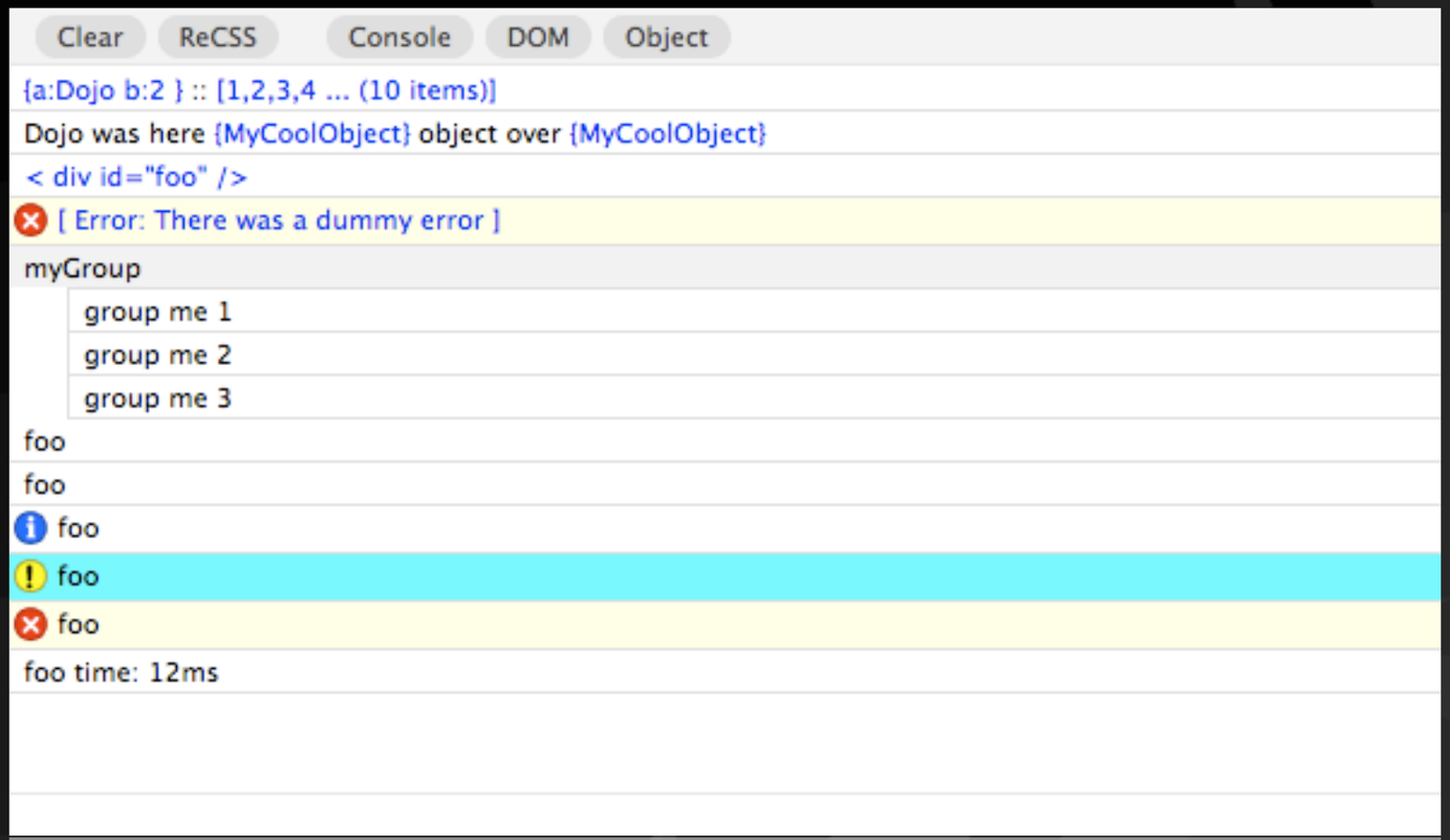

Firebug Lite

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Package / Module Loading

- dojo.require(“some.module”)
- dojo.addOnLoad(function(){ ... })
- dojo.registerModulePath(“my”, “../../my/”)
- dojo.require(“my.code”)
- dojo.provide(“my.code”)

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#ifdef in JavaScript?

```
// the code:
//>>excludeStart("something", kwArgs.condition == true);
/* code to exclude */
//>>excludeStop("something");
```

```
# exclude it:
./build.sh condition=true profile=myprofile
```

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Special Builds

- Stubs (6k dojo.js)
- Base++ (dojo.js with modules)
- Cross-Domain
- plugd
- Scope Burning

MooJo?

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scopeMap + kwArgs

```
// Dojo?
Moo.load(function(){
     place("<p>Hello, Moojo</p>", "container");
     query("p")
         .style("fontSize", "10px")
         .animate({
            fontSize:{ end: 42 }
         })
     ;
});
```

http://dante.dojotoolkit.org/static/otherlibs/moojo.html

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```
//>>excludeStart("auto", kwArgs.autoConflict == "on")
if(dojo.config.conflict){
//>>excludeStop("auto")

    // exportNS is a plugd plugin
    dojo.exportNS(dojo, dojo.global);

//>>excludeStart("auto", kwArgs.autoConflict == "on")
}
//>>excludeStop("auto")
```

http://dante.dojotoolkit.org/static/otherlibs/moojo.html

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start tests | stop tests

basic task test for frameworks.

This is not SlickSpeed, though uses the same framework.
Tests are run against a local copy of this document. They add, remove, append, connect and otherwise mangle the DOM as defined by the sample-tests.js file.
These results are [optionally] reported back. There are Charts being generated from this data

selectors	PureDom*	jQuery 1.2.6	jQuery 1.3.2	Prototype 1.6.0.3	MooTools 1.2.1	qooxdoo 0.8.2	Dojo 1.2.3	Dojo 1.3.0	YUI 2.7.0
make	15 ms 250 found	257 ms 250 found	231 ms 250 found	95 ms 250 found	69 ms 250 found	20 ms 250 found	24 ms 250 found	43 ms 250 found	65 ms 250 found
indexof	14 ms 172 found	28 ms 172 found	21 ms 172 found	34 ms 172 found	24 ms 172 found	32 ms 172 found	28 ms 172 found	19 ms 172 found	46 ms 172 found
bind	6 ms 844 found	38 ms 844 found	32 ms 844 found	49 ms 844 found	54 ms 844 found	29 ms 844 found	55 ms 844 found	43 ms 844 found	34 ms 844 found
attr	2 ms 272 found	3 ms 272 found	2 ms 272 found	3 ms 272 found	5 ms 272 found	2 ms 272 found	50 ms 272 found	11 ms 272 found	4 ms 272 found
bindattr	17 ms 844 found	72 ms 844 found	77 ms 844 found	109 ms 844 found	60 ms 844 found	44 ms 844 found	73 ms 844 found	69 ms 844 found	255 ms 844 found
table	5 ms 248 found	57 ms 248 found	40 ms 248 found	8 ms 248 found	9 ms 248 found	14 ms 248 found	8 ms 248 found	11 ms 248 found	26 ms 248 found
addanchor	19 ms 750 found	264 ms 750 found	25 ms 750 found	68 ms 750 found	70 ms 750 found	18 ms 750 found	41 ms 750 found	42 ms 750 found	41 ms 750 found
append	7 ms 500 found	345 ms 500 found	358 ms 500 found	18 ms 500 found	28 ms 500 found	21 ms 500 found	23 ms 500 found	33 ms 500 found	34 ms 500 found
addclass-odd	3 ms 275 found	15 ms 275 found	18 ms 275 found	23 ms 275 found	32 ms 275 found	13 ms 275 found	18 ms 275 found	15 ms 275 found	22 ms 275 found
style	14 ms 551 found	68 ms 551 found	54 ms 551 found	24 ms 551 found	36 ms 551 found	20 ms 551 found	63 ms 551 found	41 ms 551 found	90 ms 551 found
removeclass	15 ms 551 found	27 ms 551 found	22 ms 551 found	30 ms 551 found	46 ms 551 found	21 ms 551 found	35 ms 551 found	25 ms 551 found	187 ms 551 found
sethtml	1 ms 551 found	258 ms 551 found	72 ms 551 found	67 ms 551 found	34 ms 551 found	21 ms 551 found	20 ms 551 found	29 ms 551 found	19 ms 551 found
insertbefore	23 ms 750 found	291 ms 750 found	23 ms 750 found	81 ms 750 found	85 ms 750 found	20 ms 750 found	51 ms 750 found	29 ms 750 found	58 ms 750 found

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TaskSpeed

- Written by Authors
- Fair before Right
- An interesting start

- Charts Available*

* http://dante.dojotoolkit.org/taskspeed/report/charts.html

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It's JUST JavaScript

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Plain JavaScript

- JavaScript should have:
  - dojo.indexOf / forEach / map / filter
  - hitch / partial (we get bind()!)
  - declare / delegate / mixin / extend
- Design Philosophy
  - Defense: Namespaces / Globals
  - Offense: Forward Thinking APIs

Forward Thinking

```
// Defer to native trim if available
dojo.trim = String.prototype.trim ?
   function(str){ return str.trim() } :
   function(str){ /* slightly longer regexp version */ }

// Mimic Mozilla Array methods:
dojo.forEach = function(array, callback, scope){ ... }
dojo.map = function(array, callback, scope){ ... }
dojo.filter = function(array, callback, scope){ ... }
```

DojoType (the project)

```
// put Dojo Array methods on all Array's
dojo._clobber(Array.prototype, {
   forEach: function(callback, scope){
      dojo.forEach(this, callback, scope);
      return this;
   },
   map: function(callback, scope){
      return dojo.map(this, callback, scope);
   }
});

// use the new 'native' functions:
[1,2,3,4,5].map(function(i){ return i % 2 === 0 })
   .forEach(function(val){ /* do something */ });
```

http://code.google.com/p/dojotype

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Base at a glance

cheat sheet available: http://download.dojotoolkit.org/current-stable/cheat.pdf

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Events, Ajax, FX, DOM

- dojo.connect(node, “onclick”, function(){ });
- dojo.connect(obj, “custom”, obj, “sync”);
- dojo.xhrPost({ form:”login”, load:function(data){ ... } });
- dojo.xhrGet({ url:”foo.txt”, load:function(data){ ... } });
- dojo.anim(node, { width:200 });
- dojo.fadeIn({ node: node }).play();
- dojo.style(n, “height”, “50px”);
- dojo.place(“ Hi ”, dojo.body());

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CSS Selectors

- dojo.query(“ul > li”).addClass(“listy”);
- dojo.query(“a”).onclick(function(){ });
- dojo.query(“tr td + td”).forEach(function(n){ });
- dojo.query(“.someClass”).map(function(n){ .. });
- dojo.NodeList.prototype / dojo.extend

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Basic Patterns

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Magic Arguments

```
// function signatures with defaults
my.func = function(args){
    var opts = dojo.mixin({
        prop:"foo"
    }, args || {});
    console.log(opts.prop);
}

my.func(); // "foo"
my.func({ prop:"bar" }); // "bar"
```

DOM Arguments

```
var n = document.getElementById(“someId”);
n.style.width = “200px”;

// pattern: dojo.byId
var n = dojo.byId(“someId”)
// pick:
dojo.style(n, “width”, “200px”);
dojo.style(“someId”, “width”, “200px”);
dojo.query(“#someId”).style(“width”, “200px”);
```

DOM Arguments

```
// Accept a String ID or DomNode Reference
my.func = function(node, args){
    node = dojo.byId(node);
    var opts = dojo.mixin({
        prop:"foo"
    }, args||{});
    console.log(opts.prop);
}

my.func("someId"); // "foo"
my.func(nodeRef, { prop:"bar" }); // "bar"
```

Ambiguous Constructors (poj)

```
some.Thing = function(args, node){
   dojo.mixin(this, args);
}
dojo.extend(some.Thing, {
    opt:”a-default”,
    method: function(){
        console.log(this.opt);
    }
});

var a = new some.Thing(), b = new some.Thing({ opt:”x” });
a.opt == “a-default”
b.opt == “x”
```

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Ambiguous Constructors (declare)

```
// allows for simulated inheritance
dojo.declare(“some.Thing”, null, {
    opt:”a-default”,
    constructor: function(args, node){
        dojo.mixin(this, args);
    }
});

var a = new some.Thing(), b = new some.Thing({ opt:”x” });
a.opt == “a-default”
b.opt == “x”
```

Ambiguous Constructors

```
// uses the patterns:
dojo.require("dojo.parser");

<!-- in html -->
<div id="baz" dojoType="some.ClassThing" prop="value"></div>

// or without parsing - "poj"
new some.ClassThing({ prop:"value" }, "baz");

// or from no DOM at all
new some.ClassThing({}).placeAt("container");
```

DRY: Functional JS

```
my.turnIt = function(dir){
   // if 1, go next. -1, go left.
}

var next = dojo.partial(my.turnIt, 1),
    prev = dojo.partial(my.turnIt, -1);

// later
dojo.query(“.nextbutton”).onclick(next);
```

Dual Service Functions

```
my.func = function(node, args){
  node = dojo.byId(node); // Sting|DomNode
  /* do something to node */
}

dojo.extend(dojo.NodeList, {
   // now a plugin:
    func: dojo.NodeList._adaptAsForEach(my.func)
});

// run one, run all
my.func(“someId”, { opts:true });
dojo.query(“.someNodes”).func({ opts:true })
```

Chaining

```
// NodeList:
dojo.query(“.bar”)
   .addClass(“baz”)
   .onclick(fn)
   .place(“#foo”, “before”)
   .blah().blah().blah().blah(n).blah();

// Elsewhere
new dojox.gfx.Shape(surface)
   .addFill(“#ededed”).setStroke(...).connect(...);

// really just “this”
```

$ vs PlugD

- Dojo - dojo.query(“.class”) dojo.byId(“id”)
- jQuery - $(“.class”) $(“#id”)
- Prototype - $$(“.class”) $(“id”)
- MooTools - $$(“.class”) $(“id”)

$ vs PlugD

```
dojo.conflict();
$(document).ready(function(){
   $(“#bar”).onclick(fn);
});

// or automatically:
var djConfig = { conflict: true };

# automatically via build:
./build.sh autoConflict=on profile=plugd
```

Expansion Patterns

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dojo.Deferred

- from Twisted/Python
- ASYNC Contract
- Chained Callbacks
- Scope-Aware

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Indirect Usage

```
// plain xhr
dojo.xhrGet({
   url:"foo.html",
   load: function(data){
      /* handle response */
   }
});

// manipulating scope
dojo.xhrGet({
   url:"foo.html",
   error: dojo.hitch(otherScope, function(e){
      this.logError(e);
   })
});
```

Why embed?

```
// plain xhr
dojo.xhrGet({
   url:"foo.html",
   load: function(data){
      /* handle response */
      dojo.xhrPost({
         form:"bar",
         content: data,
         load:function(){
            // then update some ui, add another callback ...
            // "ugh"
         }
      })
   }
});
```

More ‘Direct’ Usage

```
var d = dojo.xhrGet({ url:”foo.html“ })
   .addCallback(function(data){
      // can modify data along response chain
      return data.toLowerCase();
   })
   .addCallback(andPost) // a function that handles data
   .addErrback(otherScope, “errHandler”);

// elsewhere:
d.addCallback(function(data){
   /* handle it, return nothing */
});
```

dojo.data

- More than just DOM
- API at the core
  - Read, Write, Identity, Notification
- Common Functions and Callbacks
- Direct communication
- RESTful

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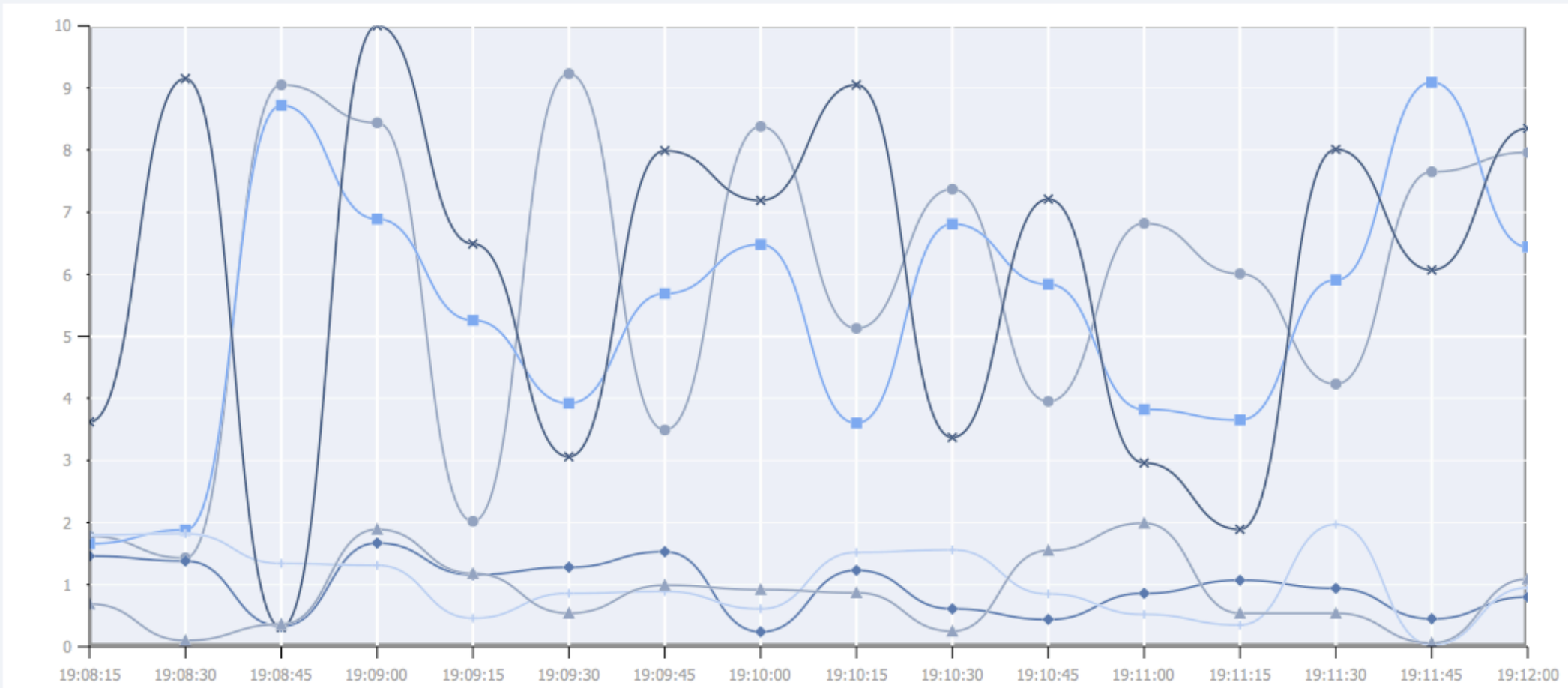
Store Example?

```
// load the store:
dojo.require(“dojox.data.GoogleServiceStore”);

// make the store:
var store = new dojox.data.GoogleSearchStore(...);

store.fetch({
      // the request:
      query:{ q:”Dojo” },
      // the “wiring”
      onItem: dojo.hitch(thinger, “addItem”),
      onComplete: dojo.hitch(thinger, “render”)
});
```

Stock Name	Symbol	Updated	Price	+/-	Change	Low	High	Open
Anduct	ANDT	19:12:15	1.09	^	+1.03 (-94.51%)	0.00	3.13	3.13
BAY Corporation	BAYC	19:12:15	8.35	^	+2.28 (-27.32%)	0.00	10.00	9.79
Bagies Consulting	BGCN	19:12:15	0.95	^	+0.92 (-96.85%)	0.00	4.11	4.11
Ations Europe	ATEU	19:12:15	0.80	^	+0.35 (-43.88%)	0.00	6.72	6.72
Datio PLC	DTOA	19:12:15	6.44	v	2.65 (-41.05%)	0.00	10.00	2.11
Corcor PLC	CRCR	19:12:15	7.96	^	+0.31 (-3.89%)	0.00	10.00	8.44



http://persevere.sitepen.com/stocker.html

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dojox.data Stores:

- AndOrReadStore
- AppStore
- AtomReadStore
- CouchDBRestStore
- CssRuleStore
- CsvStore
- FileStore
- FlickrRestStore / FlickrStore
- GoogleFeedStore
- GoogleSearchStore
- HtmlStore
- jsonPathStore
- jsonRestStore
- OpmlStore

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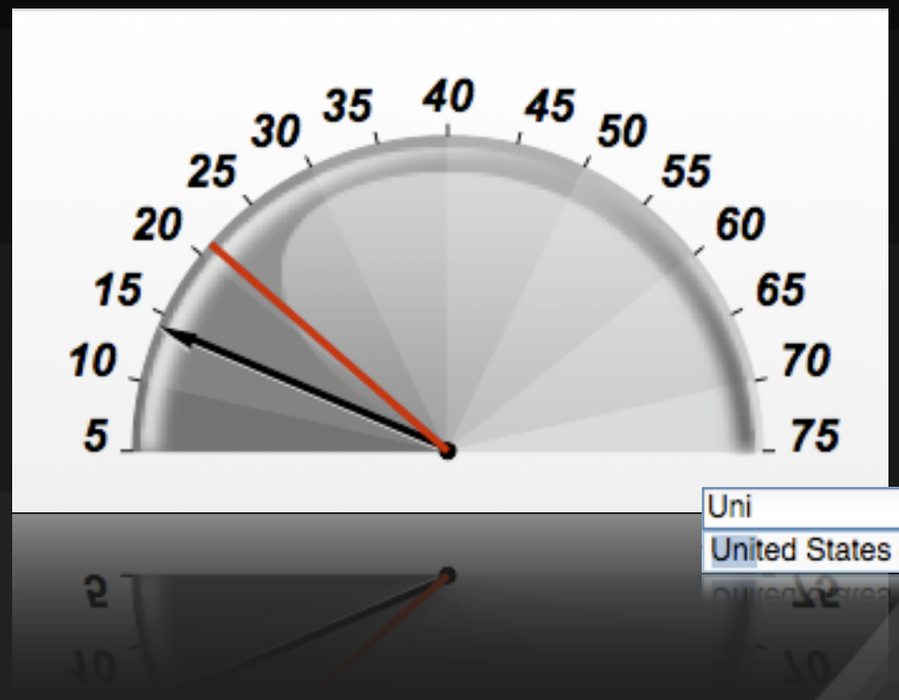
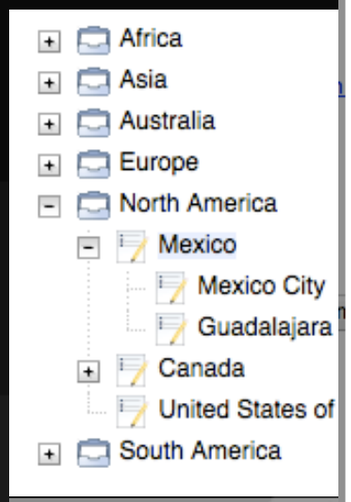
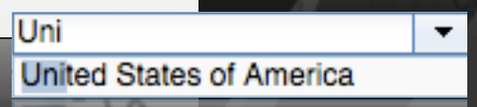
Data Consumers:







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RPC / SMD

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SMD

```
dojo.require(“dojox.rpc.Service”);

var goog = new dojox.rpc.Service(“google.smd”);

goog.websearch({ q:”Dojo” }).addCallback(function(response){
   // handle the responses
});

goog.booksearch({ q:”Dojo” }).addBoth(function(response){
   // Books about Dojo
});
```

The Dojo Toolkit

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- Long standing Development
- Large, Active Developer Base
- Friendly Professional Community
- Liberally Licensed, Clean IP

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http://dojotoolkit.org http://dojofoundation.org

Questions?

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