RICE®

Web Development

COMP 431 / COMP 531

Scott E Pollack, PhD

February 16, 2016

Recap

- HTML and HTML5
- JavaScript and JS Libraries
- Forms and Events
- CSS and Style Frameworks
- MVC and HTML Templates
- Homework Assignment 4 (JavaScript Game)
  - **Due Thursday 2/18**

~~Style (Bootstrap)~~
~~Libraries (jQuery)~~
~~MVC~~
AngularJS

COMP 531
Draft Front-End Review
Due Tuesday 2/23

“the superheroic framework”

- Model-View-(Whatever)
- Single-Page-Application
- Two-Way Data Binding
  - Reduces boilerplate
  - Fast updates View-to-Model and back
- Observation built-in
- Separation of Concerns
  - HTML template vs JS logic
- Plain Old Javascript Objects

- Complete front-end stack
- Unit testing with Karma
- Great for tiny apps
- Good for medium apps
- Even works for large apps
  - Be careful of too many watchers
- Opinionated!
  - There is a “way” to do things

See also http://jeffwhelpley.com/angularjs/

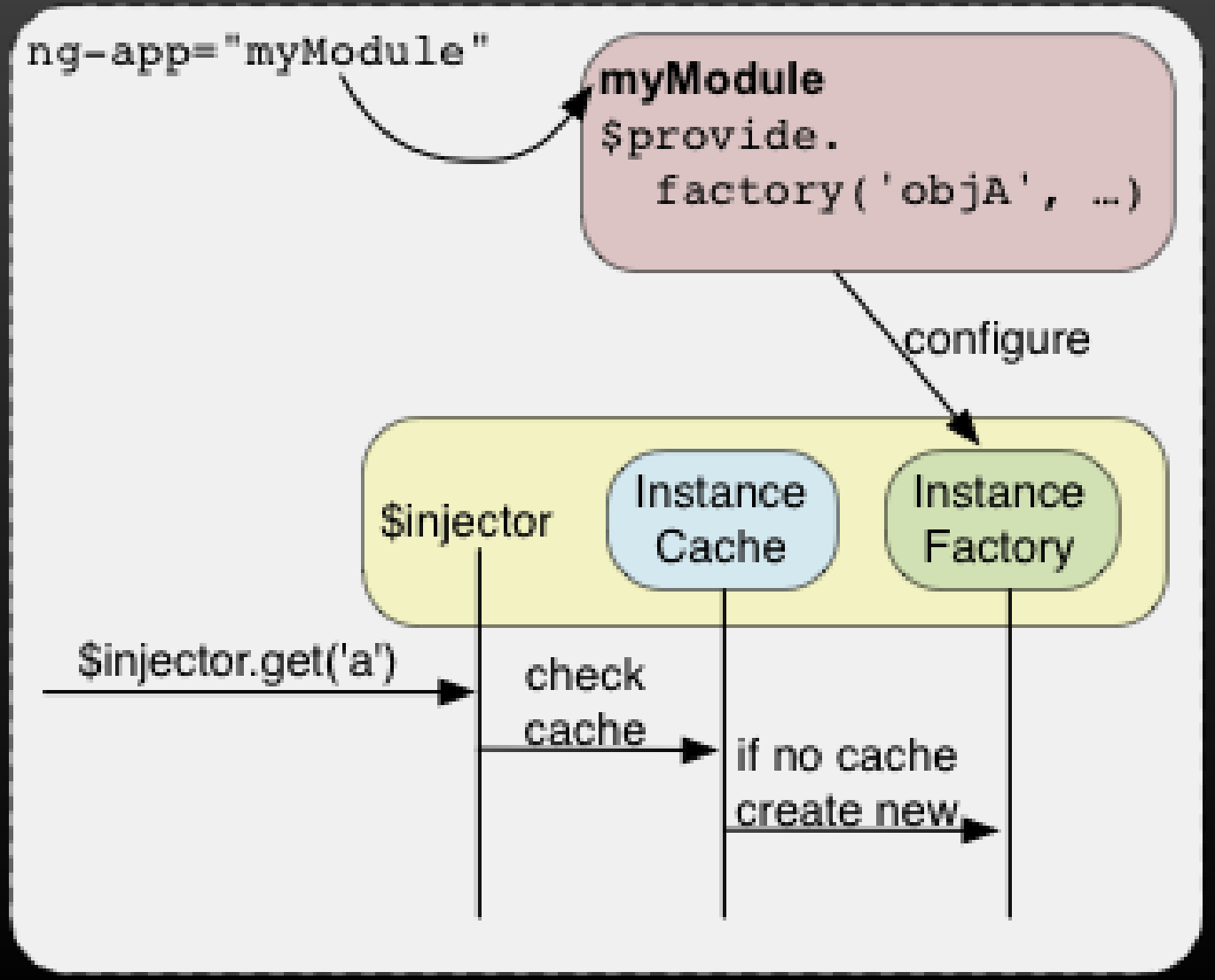
Dependency Injection

> Dependency injection means giving an object its instance variables. Really. That's it.
>
> *James Shore, 22 March 2006*

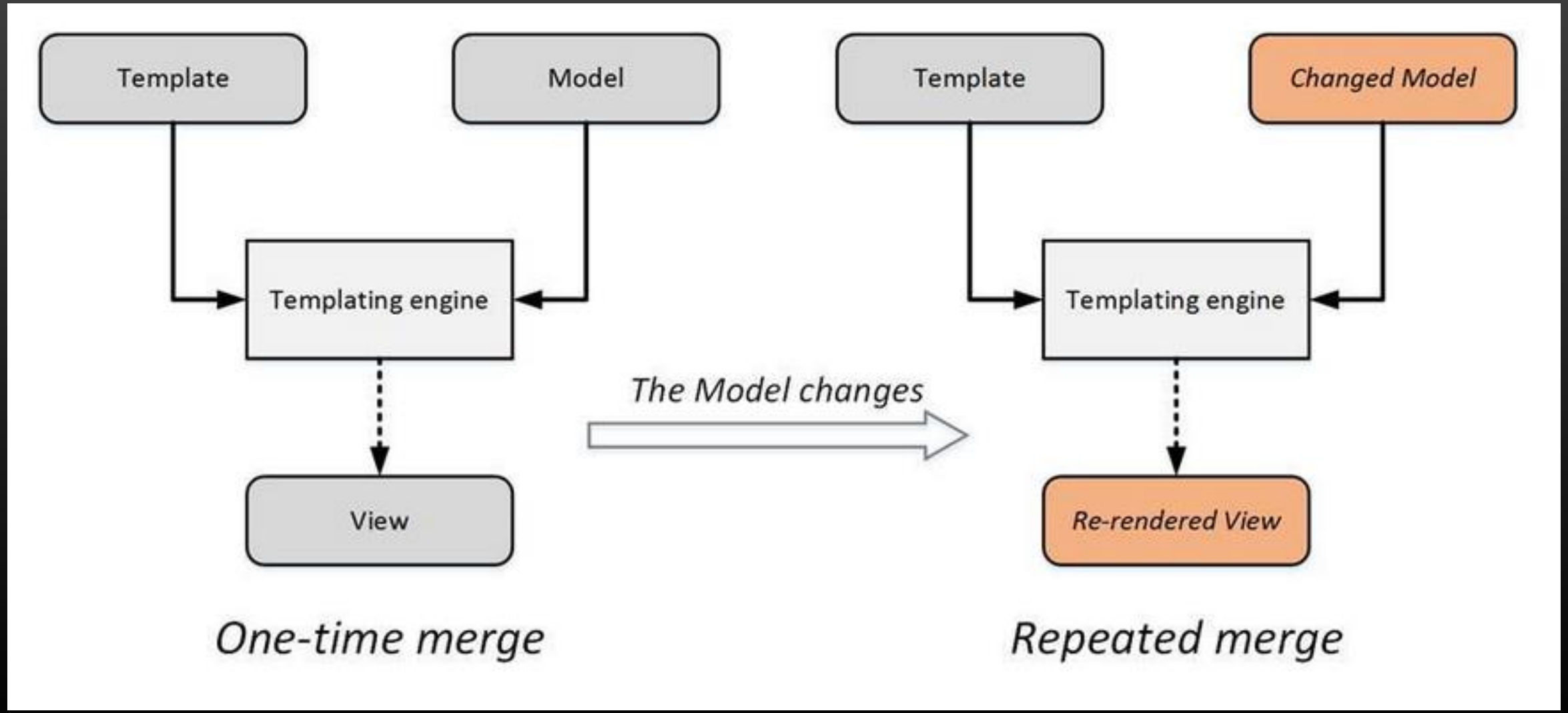
```java
// An example without dependency injection
public class Client {
    private Service service;

    Client() {
        this.service = new ServiceExample();
    }

    public String greet() {
        return "Hello " + service.getName();
    }
}
```

```java
// An example with dependency injection
public class Client {
    private Service service;

    Client(Service service) {
        this.service = service;
    }

    public String greet() {
        return "Hello " + service.getName();
    }
}
```

DI in Angular

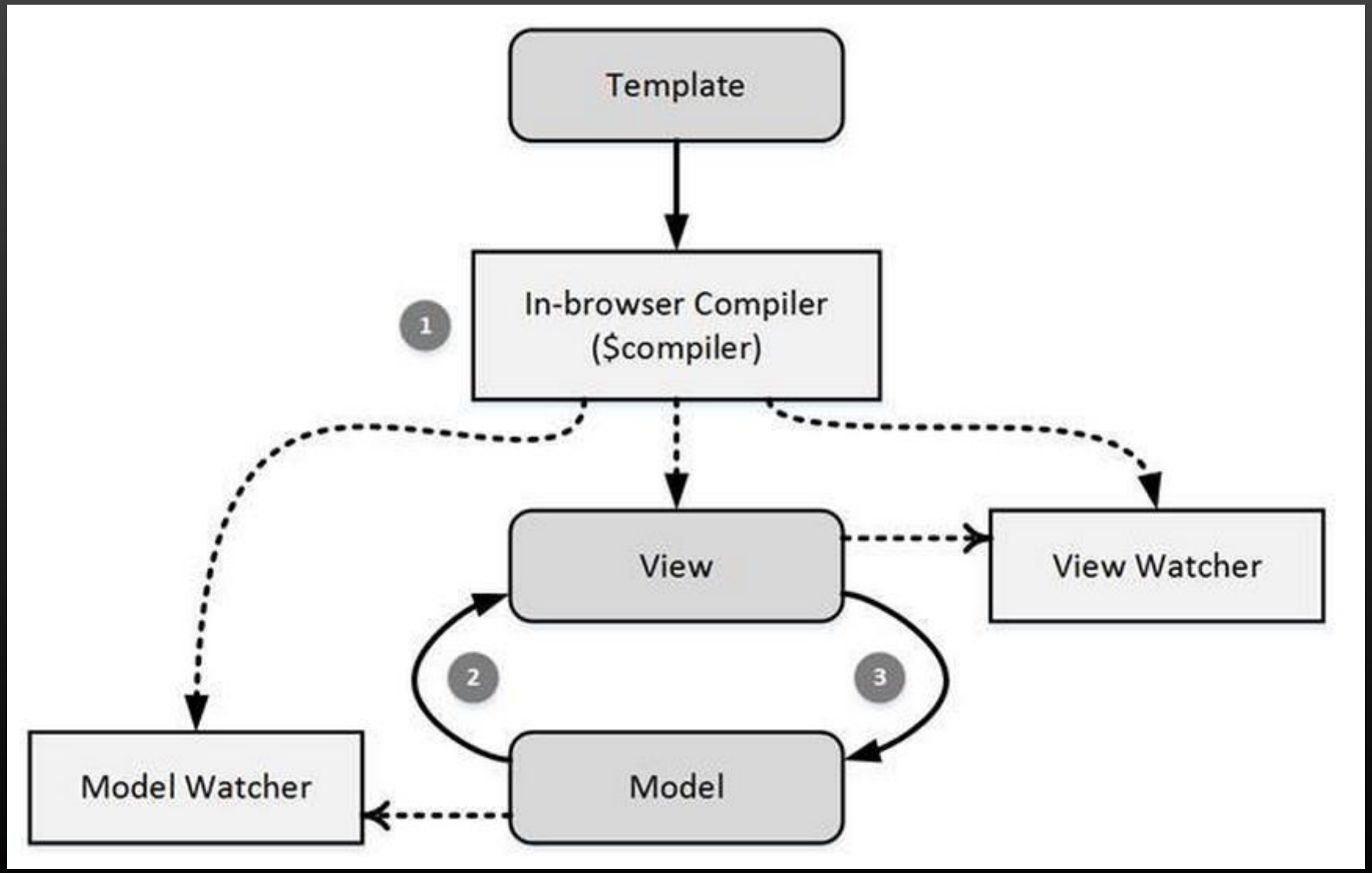


Templating



From *Unraveling AngularJS 1.4* by Istvan Novak

Angular Templating



From *Unraveling AngularJS 1.4* by Istvan Novak

$scope and Controllers

- We *injected* $scope into the Controller
- $scope was *magically* available in the View

```
<body ng-controller="MainCtrl">

<div ng-repeat="post in posts">
    <h3>{{post.title}}</h3>
    <p>{{post.body}}</p>
</div>
```

- This can get us into problems later on,

  better to be explicit

```
4  angular.module('helloNg', [])
5      .controller('MainCtrl', MainCtrl);
6
7  MainCtrl.$inject = ['$scope']
8  function MainCtrl($scope) {
9      $scope.posts = [
10         {'title':'the first', 'body':'message' },
11         {'title':'the second', 'body':'lorem ipsum'},
12         {'title':'the third', 'body':'e plurbus unum'},
13     ]
14 }
```

$scope and Controllers

```
<body ng-controller="MainCtrl as vm">

<div ng-repeat="post in vm.posts">
  <h3>{{post.title}}</h3>
  <p>{{post.body}}</p>
</div>
```

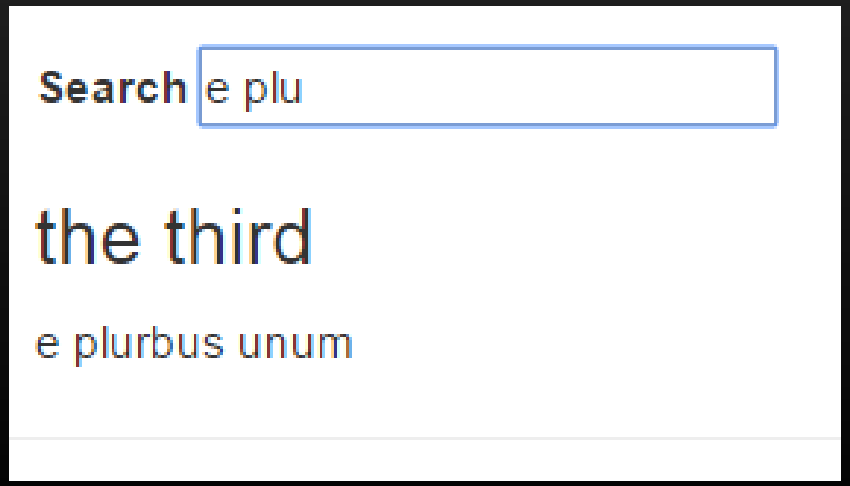
```
<body ng-controller="MainCtrl">

<div ng-repeat="post in posts">
    <h3>{{post.title}}</h3>
    <p>{{post.body}}</p>
</div>
```

```
angular.module('helloNg', [])
    .controller('MainCtrl', MainCtrl);

function MainCtrl() {
    var vm = this;

    vm.posts = [
        {'id':1, 'title':'the first', 'body':'m
        {'id':2, 'title':'the second', 'body':'
        {'id':3, 'title':'the third', 'body':'e
    ]
```

```
4  angular.module('helloNg', [])
5      .controller('MainCtrl', MainCtrl);
6
7  MainCtrl.$inject = ['$scope']
8  function MainCtrl($scope) {
9      $scope.posts = [
10         {'title':'the first', 'body':'message' },
11         {'title':'the second', 'body':'lorem ipsum'},
12         {'title':'the third', 'body':'e plurbus unum'},
13     ]
14 }
```

It gets better

```
<section>
  <label for="search">Search</label>
  <input type="text" placeholder="search keyword" ng-model="vm.searchKeyword" id="search">
</section>

<section ng-repeat="post in vm.posts | filter: vm.searchKeyword">
  <h3>{{post.title}}</h3>
  <p>{{post.body}}</p>
</section>
```

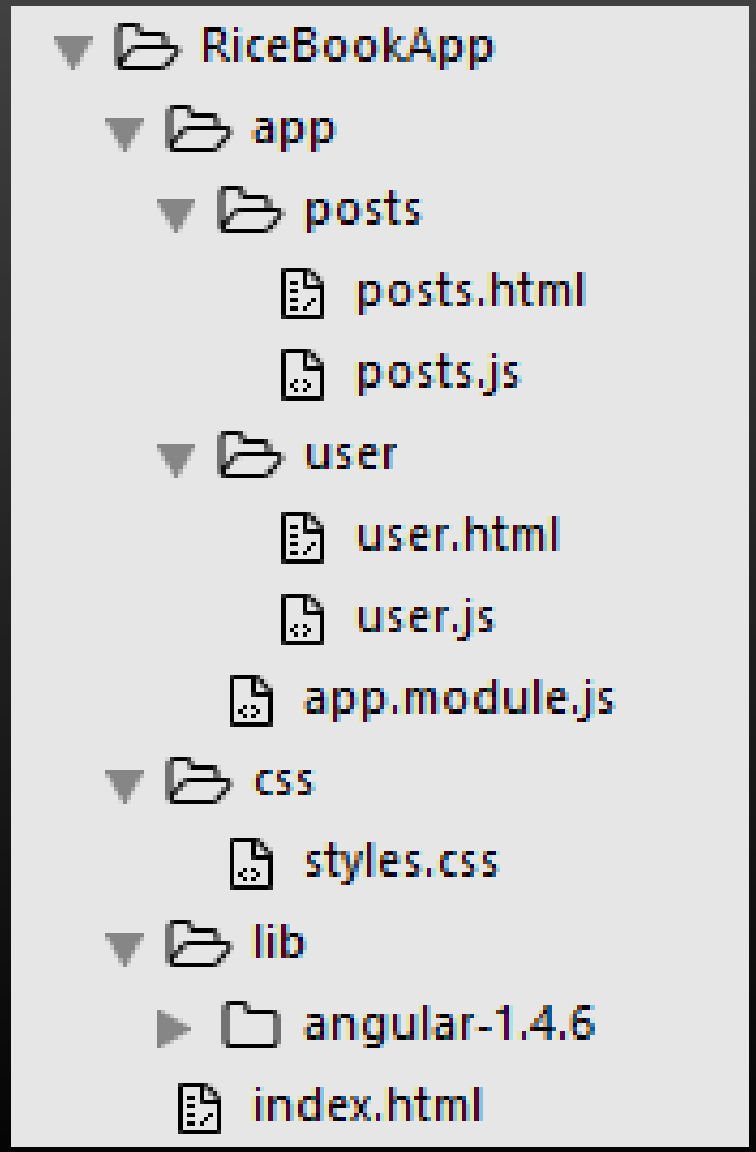


Multiple Controllers

- Separation of Concerns
- one Controller per View
- There may be multiple views at once on the page

- Views
  - Navigation
  - Posts
  - Status
  - Followers

- Directory Structure by feature



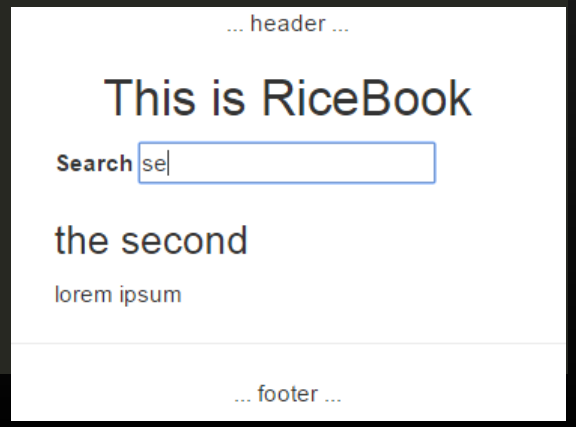
Splitting it up with ngInclude

```
<link rel="stylesheet" href="css/styles.css">
<script src="app/app.module.js"></script>
<script src="app/posts/posts.js"></script>
<script src="app/user/user.js"></script>
```

user.html ● | jasmine.html × | index.html ×

```
1  <div ng-controller="UserCtrl as vm">
2      <h2>{{ vm.status }}</h2>
3  </div>
4
```

```
<header>
  ... header ...
  <div ng-include="'app/user/user.html'"></div>
</header>

<div ng-include="'app/posts/posts.html'"></div>

<hr>

<footer>
... footer ...
</footer>
```



user.html ● | user.js × | jasmine.html × | in

```
1   (function() {
2   'use strict'
3
4   angular.module('riceBookApp')
5       .controller('UserCtrl', UserCtrl);
6
7   function UserCtrl() {
8       var vm = this;
9       vm.status = "This is RiceBook"
10  }
11
12  })();
13
```

ngModules

Angular's phonecatApp

```
angular.module('phonecatApp', [
  'ngRoute',
  'phonecatAnimations',

  'phonecatControllers',
  'phonecatFilters',
  'phonecatServices'
])
  .config(['$routeProvider',
  function($routeProvider) {
```

```
/* Filters */

angular.module('phonecatFilters', []).filter('checkmark', function
  return function(input) {
    return input ? '\u2713' : '\u2718';
  };
});
```

```
angular.module('phonecatServices', ['ngResource'])
    .factory('Phone', ['$resource', function($resource){
    return $resource('phones/:phoneId.json', {}, {
      query: {method:'GET', params:{phoneId:'phones'}, isArray:true}
    });
  }]);
```

```
angular.module('phonecatControllers', [])
  .controller('PhoneListCtrl', ['$scope', 'Phone',
  function($scope, Phone) {
    $scope.phones = Phone.query();
    $scope.orderProp = 'age';
  }])

  .controller('PhoneDetailCtrl', ['$scope', '$routeParams', 'Phone',
  function($scope, $routeParams, Phone) {
    $scope.phone = Phone.get({phoneId: $routeParams.phoneId}, functio
      $scope.mainImageUrl = phone.images[0];
    });

    $scope.setImage = function(imageUrl) {
      $scope.mainImageUrl = imageUrl;
    };
```

Debugging Angular

- angular.element($0).scope().$apply()

https://www.clear.rice.edu/comp431/sample/RiceBookApp

DEMO

The “filter” Filter

Name of filter arguments

- In the view

```
<div ng-repeat="post in vm.posts | filter: vm.searchKeyword">
```

- Access from within a controller

```
MainCtrl.$inject = ['filterFilter']
function MainCtrl(filterFilter) {
    var vm = this;
    vm.posts = [
        {'id':1, 'title':'the first', 'body':'message' },
        {'id':2, 'title':'the second', 'body':'lorem ipsum'},
        {'id':3, 'title':'the third', 'body':'e plurbus unum'},
    ]
    vm.filteredPosts = filterFilter(vm.posts, 'e pl')
}
```

Dynamic Custom Filtering

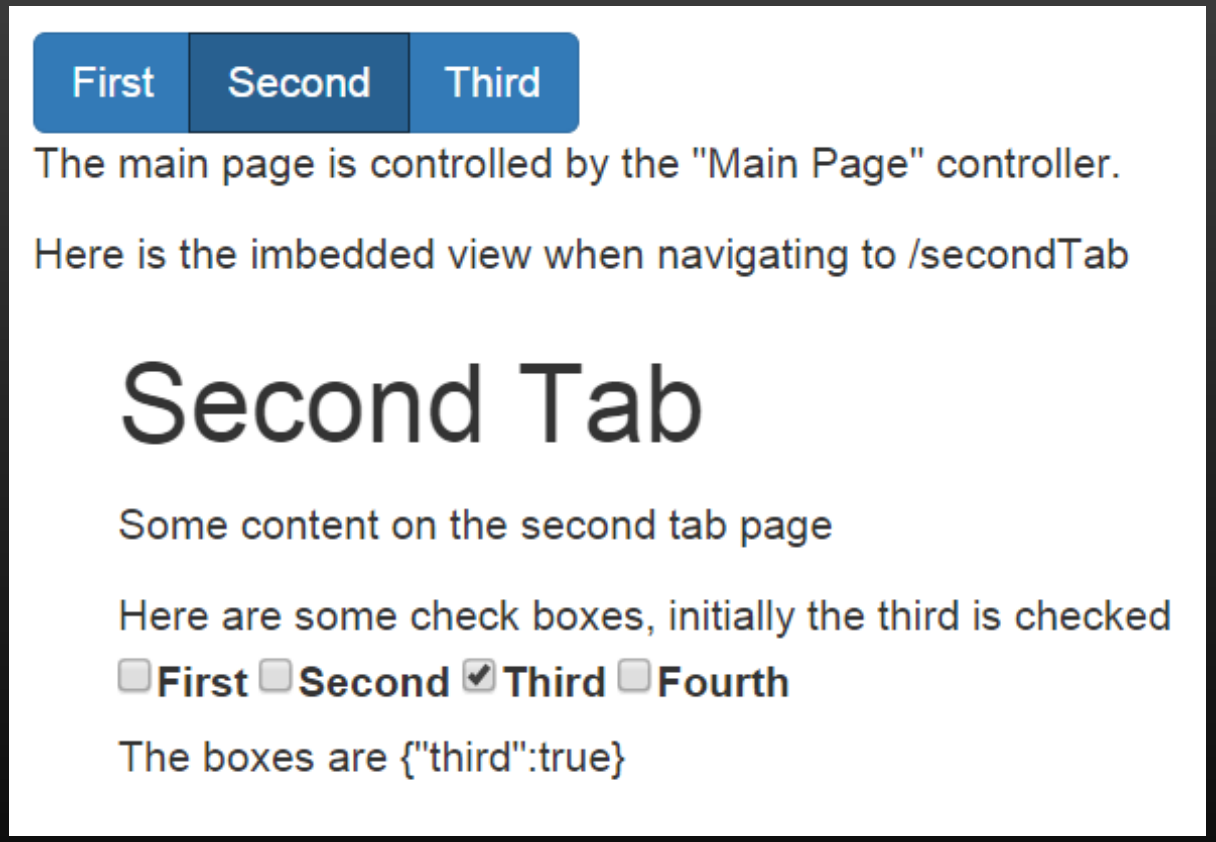
```
<input type='text' ng-model="vm.bodyWordCount" placeholder="bodyWordCount">

<div ng-repeat="post in vm.posts | bodyWordCountFilter:vm.bodyWordCount">
```

Custom Filter

```
angular.module('helloNg', [])
    .controller('MainCtrl', MainCtrl)
    .filter('bodyWordCountFilter', BodyWordCountFilter)
    ;

function BodyWordCountFilter() {
    return function(posts, count) {
        if (!count) {
            return posts
        }
        return posts.filter(function(post) {
            return post.body.split(' ').length == count
        })
    }
}
```

https://www.clear.rice.edu/comp431/sample/TabApp

Routing



DEMO

```
angular.module('tabApp', ['ngRoute'])
    .config(config)
    ;

function config($routeProvider) {
    $routeProvider
    .when('/firstTab', {
        templateUrl: 'tabOne.html',
        controller: 'FirstCtrl',
        controllerAs: 'vm'
    })

    .when('/secondTab', {
        templateUrl: 'tabTwo.html',
        controller: 'SecondCtrl',
        controllerAs: 'vm'
    })

    .otherwise({
        redirectTo: '/firstTab'
    })
}
```

References

- **FOLLOW THIS STYLE GUIDE**
  https://github.com/johnpapa/angular-styleguide

- Angular Docs
  https://docs.angularjs.org/api

- w3schools
  http://www.w3schools.com/angular/

In-Class Exercise: More Angularization

https://www.clear.rice.edu/comp431/sample/RiceBookApp

https://www.clear.rice.edu/comp431/sample/TabApp

- The "posts" controller supplies posts to the view (we did this last time) add images if you didn't already
  - *Hint*: you'll want to use `<img ng-src="{{ post.imgSrc }}">`
- Implement the search bar to filter posts by body/author
- Implement routing in *index.html* to "navigate" from the landing page to the main page to the profile page

Turnin entire app *.html & *.js
COMP431-S16:inclass-11