Dynamic Web Development

Produced by

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ANGULARJS

PART 3

FILTERS, SERVICES & DIRECTIVES

Section Outline

1. **Introduction** – Why you should be using AngularJS
2. **Terminology** – The critical foundation for understanding
3. **Modules** – Reusable functionality
4. **Views** – UI (User Interaction)
5. **Controllers** – Facilitating communication between the model and the view
6. **Routes** – Navigating the view
7. **Filters** – Changing the way you see things
8. **Services** – Five recipe flavors
9. **Directives** – Extending HTML
10. **Case Study** – Labs in action
11. **Conclusions** – The end is nigh

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Basic Building Blocks

WHAT YOU NEED TO BUILD A BASIC ANGULAR WEB APP

Filters

CHANGING THE WAY YOU SEE THINGS

Filters

What is a filter:

- A filter formats the value of an expression for display to the user.
  - (https://docs.angularjs.org/guide/filter)

Filters can be used in HTML using the bar notation or they can be used in JavaScript by injecting the **$filter** service.

Filters

HTML EXAMPLE

```
<div ng-app='myApp' ng-controller="myController">
   <p>{{name | uppercase}}</p>
   <p>{{uppercaseName()}}</p>
</div>
```

JAVASCRIPT EXAMPLE

```
var module = angular.module('myApp', []);

module.controller('myController', [
   '$scope', '$filter', function($scope, $filter) {

      $scope.name = 'John Smith';

      $scope.uppercaseName = function() {
         return $filter('uppercase')($scope.name);
      };

   }]);
```

Filters with Parameters

HTML EXAMPLE

```
{{ expression | filterName : param1 : param2 }}
```

JAVASCRIPT EXAMPLE

```
$filter('filterName')(expression, param1, param2);
```

Core Filters

AngularJS has several filters built in:

- currency
- date
- filter
- json
- limitTo
- lowercase
- number
- orderby
- uppercase

```
{{ '2015-03-19T19:00:00.000Z' | date : 'MMMM yyyy' }}
```

```
$filter('date')(new Date(), 'MMMM yyyy');
```

Core Filters

AngularJS has several filters built in:

- currency
- date
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- lowercase
- number
- orderby
- uppercase


```
{{ ['pear', 'apple', 'orange'] | filter : 'r' }}
```

```
$filter('filter')(['pear', 'apple', 'orange'], 'r');
```

Core Filters

AngularJS has several filters built in:

- currency
- date
- filter
- json
- limitTo
- lowercase
- number
- orderby
- uppercase

Format in json for easy searching

```
{{ { first: 'John', last: 'Smith } | json }}
```

```
$filter('json')({ first: 'John', last: 'Smith'});
```

Core Filters – More Examples

{{ 'hello' | uppercase }}	→	HELLO
{{ 2000 | currency }}	→	$2,000.00
{{ 2500 | currency:'EUR€' }}	→	EUR€2,500.00
{{ 1288323623006 | date }}	→	Oct 29, 2010
{{ 1288323623006 | date:'dd/MM/yyyy' }}	→	29/10/2010
{{ 1288323623006 | date:'EEE dd/MM/yy' }}	→	Fri 29/10/10

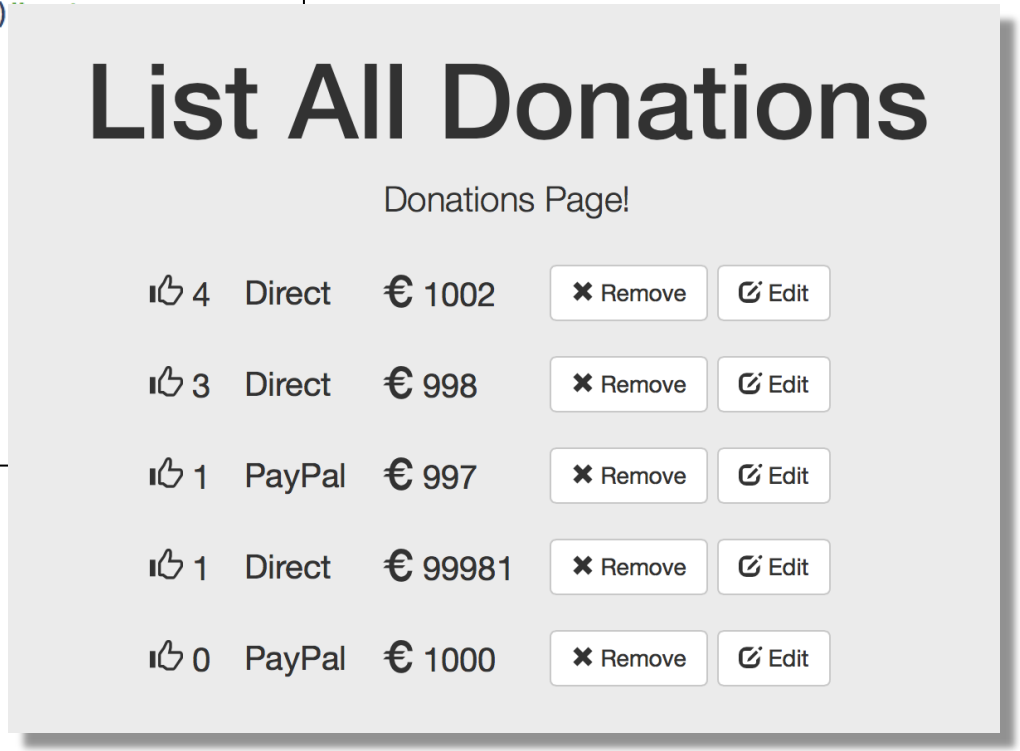
Core Filters

Filters can be chained/stacked (where sensible)

1. *customers | orderBy:'-balance' | limitTo:2* --- only show the two richest customers
2. *customers | filter:{name:'ki'} | orderBy:'-balance' | limitTo:5* the five richest customers whose name contains the substring 'ki'.

Core Filters – Our Example

```
<div ng-controller="donationsController as list">
<table align="center" valign="middle">
  <tbody ng-repeat="donation in donations | orderBy:'-upvotes'">
      <tr style="height:55px; font-size:20px; margin-left:20px; margin-right:20px; valign="middle"; >
        <td>
          <span class="glyphicon glyphicon-thumbs-up" ng-click="incrementUpvotes(donation)
            {{donation.upvotes}}
        </td>
        <td>
          <span style="height:55px; font-size:20px; margin-left:20px; margin-right:20px;
            {{donation.paymenttype}}
          </span>
        </td>
        <td>
          <span class="glyphicon glyphicon-euro"></span>
          {{donation.amount}}
        </td>
    <td>
```



Filter Definition

You can define a new filter within a module.

```
angular.module('reverseFilter', [])
   .filter('reverse', [function() {
      return function(input, uppercase) {
         var i, out = "";
         input = input || '';
         for (i = 0; i < input.length; i++) {
            out = input.charAt(i) + out;
         }
         // conditional based on optional argument
         if (uppercase) {
            out = out.toUpperCase();
         }
         return out;
      };
   }]);
```

```
{{ 'Hello, World!' | reverse : true }}
```

```
$filter('reverse')('Hello, World!', true);
```

Services

FIVE RECIPE FLAVORS

AngularJS Services

Services provide a method for us to keep data around for the lifetime of the app and communicate across controllers in a consistent manner.

Services are singletons, which are objects that are instantiated only once per app (by the $injector). They provide an interface to keep together methods that relate to a specific function.

Angular comes with several built-in services, of different types ***(or recipes***) which we'll cover in the next few slides.

You can also make your *own* services for any decently complex application.

Value

The value recipe stores a value within an injectable service.

A value can store any service type: a string, a number, a function, and object, etc.

This value of this service can now be injected into any controller, filter, or service.

```
//define a module
var myModule = angular.module('myModule', []);

//define a value
myModule.value('clientId', 'a12345654321x');

//define a controller that injects the value
myModule.controller('myController', ['$scope', 'clientId', function ($scope, clientId) {
   $scope.clientId = clientId;
}]);
```

Factory

The factory recipe is similar to a value recipe except that it adds these abilities:

- Ability to use dependency injection
- Lazy initialization

A factory (like a value) can also return any data type.

```
//define a factory
myModule.factory('toUpperCase', ['$filter', function($filter) {

   return function(value) {
      return $filter('uppercase')(value);
   }

}]);

//inject the toUpperCase factory
myModule.controller('myController', ['toUpperCase', function(toUpperCase) {
   this.uppercase = toUpperCase('john');
}]);
```

Service

Just to make things a little confusing, we have a service recipe called service.

- Yes, we have called one of our service recipes 'Service'. We regret this and know that we'll be somehow punished for our misdeed. It's like we named one of our offspring 'Child'. Boy, that would mess with the teachers. (https://docs.angularjs.org/guide/providers)

Service

The service recipe will generate a singleton of an instantiated object.

```
//define a service
myModule.service('person', [function() {
   this.first = 'John';

   this.last = 'Jones';

   this.name = function() {
      return this.first + ' ' + this.last;
   };
}]);

//inject the person service
myModule.controller('myController', ['$scope', 'person', function($scope, person) {
   $scope.name = person.name();
}]);
```

Provider

"…the Provider recipe is the core recipe type and all the other recipe types are just syntactic sugar on top of it. It is the most verbose recipe with the most abilities, but for most services it's overkill"

(https://docs.angularjs.org/guide/providers).

The provider recipe can be injected during a module's configuration phase.

Provider

```
//define a provider
myModule.provider('prefix', [function() {
   var prefix = '';

   //setPrefix can be called during the module's config phase
   this.setPrefix = function(value) {
      prefix = value;
   };

   //this special property is required and returns a factory
   this.$get = [function() {
      return function(value) {
         return prefix + value;
      }
   }];
}]);

//inject the provider in the config phase
myModule.config(['prefixProvider', function(prefixProvider) {
   prefixProvider.setPrefix('John ');
}]);

//inject the provider's factory
myModule.controller('myController', ['prefix', function(prefix) {
   this.value = prefix('Smith');  //value is set to "John Smith"
}]);
```

Constant

The constant recipe is similar to the value recipe except that its service value is also available during the module's configuration phase.

```
myModule.constant('author', 'John Smith');

myModule.config(['author', function(author) {
   console.log('This app was made by: ' + author); // "John Smith"
}]);

myModule.controller('myController', ["author", function (author) {
   this.author = author; // "John Smith"
}]);
```

Directives

EXTENDING HTML

Directives

What is it?

- At a high level, directives are markers on a DOM element (such as an attribute, element name, comment or CSS class) that tell AngularJS's HTML compiler ($compile) to attach a specified behavior to that DOM element or even transform the DOM element and its children.
- (https://docs.angularjs.org/guide/directive)

```
<form>
   <p>
      Enter your name:
      <input type="text" ng-model="name" required>
      <button type="button" ng-click="submit()" ng-disabled="!name">Submit</button>
   </p>
   <p ng-show="name">
      Hello, {{name}}
   </p>
</form>
```

Directives

Directives **extend** HTML to suit the needs of dynamic web app (SPA) development

- ng-app
- ng-model
- ng-repeat
- ng-controller
- ng-init
- etc

Custom directives also supported

Recall our 2-way data binding

Directive Documentation (for writing your own!)

For full documentation on how to write directives, see these pages:

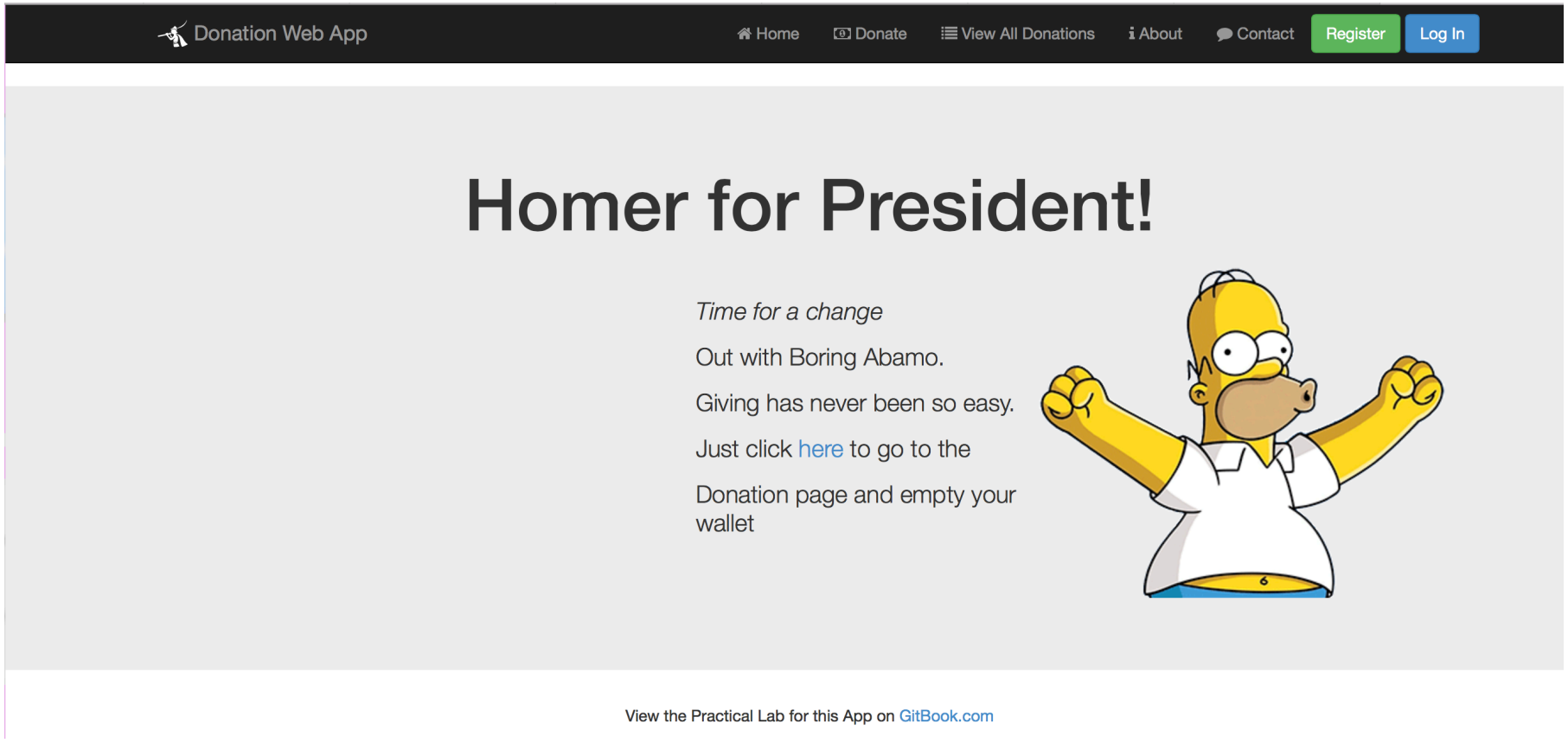
https://docs.angularjs.org/guide/directive

https://docs.angularjs.org/api/ng/service/$compile

Case Study

LABS IN ACTION

Demo Application



Conclusions

THE END IS NIGH

Essentials for Building Your First App

HTML DOCUMENT

```
<!doctype html>
<html lang="en" ng-app="app">
   <head>
      <title>App Title</title>
      <link rel="stylesheet" href="css/styles.css">
   </head>
   <body>
      <script src="js/angular.js"></script>
      <script src="js/app.js"></script>
      <script src="js/moduleA.js"></script>
   </body>
</html>
```

APP.JS

```
var module = angular.module('app', ['moduleA']);
```

Great Resources

Official Tutorial – https://docs.angularjs.org/tutorial

Official API – https://docs.angularjs.org/api

Developer Guide – https://docs.angularjs.org/guide

Video Tutorials – https://egghead.io/

Video Introduction – https://www.youtube.com/watch?v=i9MHigUZKEM

YouTube Channel – https://www.youtube.com/channel/UCm9iiIfgmVODUJxINecHQkA

Articles, explanations, tutorials – http://www.ng-newsletter.com/

About the Original Author

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Application Foundations

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Questions?