Recipes with Angular.js

Practical concepts and techniques for rapid web application development

```
<body ng-app>
  <div ng-controller="MyCtrl">
    <button class="btn" ng-click="toggle()">Toggle</button>
    <p ng-show="isVisible()">Hello World!</p>
    <p>Debug Scope: visible = {{visible}}</p>
  </div>
</body>
```

by Frederik Dietz

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Practical concepts and techniques for rapid web application development

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Preface

Introduction

Angular.js 1.0 has been released only half a year ago but is already changing the development status quo of client-side web apps. With its focus on CRUD based applications it achieves a very high productivity unmatched by other frameworks. If you are using Angular.js, or considering it, this cookbook provides easy to follow recipes for issues you are likely to face.

Each recipe solves a specific problem and provides a solution and in-depth discussion of it.

Code Examples

All code examples in this book can be found on http://github.com/fdietz/recipes-with-angular.js

How to contact us

If you have questions or comments please get in touch with:

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Acknowledgements

Thanks go to bla for reviewing the book!

An Introduction to Angular.js

Including angular.js in a web page

Problem

You want to include Angular.js in a web page.

Solution

In order to get your first Angular.js app up and running you need to include the angular javascript file via script tag and make use of the `ng-app` directive.

```
<html>
  <head>
    <script src="http://ajax.googleapis.com/ajax/libs/angularjs/1.0.4/angul\
ar.js"></script>
  </head>
  <body ng-app>
    <p>This is your first angular expression: {{ 1 + 2 }}</p>
  </body>
</html>
```

Tip: You can checkout a complete example on github[a].

[a] http://github.com/fdietz/recipes-with-angular.js/chapter1/recipe1

Discussion

Adding the `ng-app` directive tells Angular to kick in its magic. The expression `{{ 1 + 2 }}` is evaluated by Angular and the result `3` is rendered. Note, that removing `ng-app` will result in the browser to render the expression as is instead of evaluating it. Play around with the expression! You can use numbers as in the example or concatenate Strings, etc.

For brevity reasons we skip the boilerplate code in the following recipes.

Binding a text input to an expression

Problem

You want user input to be used in another part of your html page.

Solution

Use Angulars `ng-model` directive to bind the text input to the expression

```
Enter your name: <input type="text" ng-model="name"></input>
<p>Hello {{name}}!</p>
```

Discussion

Assigning "name" to the `ng-model` attribute and using the name variable in an expression will keep both in sync automatically. Typing in the text input will automatically reflect these changes in the paragraph below.

Consider how you would implement this traditionally using jQuery:

```
<html>
  <head>
    <script src="http://code.jquery.com/jquery.min.js"></script>
  </head>
  <body>
    Enter your name: <input type="text"></input>
    <p id="name"></p>

    <script>
      $(document).ready(function() {
        $("input").keypress(function() {
          $("#name").text($(this).val());
        });
      });
    </script>

  </body>
</html>
```

On document ready we bind to the keypress event in the text input and replace the text in the paragraph in the callback function. Using jQuery you need to deal with document ready callbacks, element selection, event binding and the context of this. Quite a lot of concepts to swallow and lines of code to maintain!

Convert expression output with Filters

Problem

When presenting data to the user, you might need to convert the data to a more user-friendly format. In our case we want to uppercase the "name" value from the previous recipe in the expression.

Solution

Use the `uppercase` Angular filter.

```
1 Enter your name: <input type="text" ng-model="name"></input>
2 <p>Hello {{name | uppercase }}!</p>
```

Discussion

Angular uses the `|` (pipe) character to combine filters with variables in expressions. When evaluating the expression, the name variable is passed to the uppercase filter. This is similar to working with the Unix bash pipe symbol where an input can be transformed by another program. Also try the `lowercase` filter!

Use Controllers for your business logic

Problem

You want to hide an html element on button click.

Solution

Use the `ng-hide` directive in conjunction with a controller to change the visibility status on button click.

```
<html>
  <head>
    <script src="js/angular.js"></script>
    <script src="js/app.js"></script>
    <link rel="stylesheet" href="css/bootstrap.css">
  </head>
  <body ng-app>
    <div ng-controller="MyCtrl">
      <button ng-click="toggle()">Toggle</button>
      <p ng-show="isVisible()">Hello World!</p>
      <p>Debug Scope: visible = {{visible}}</p>
    </div>
  </body>
</html>
```

And the controller in `js/app.js`:

```
function MyCtrl($scope) {
  $scope.visible = true;

  $scope.toggle = function() {
    $scope.visible = !$scope.visible;
  };

  $scope.isVisible = function() {
    return $scope.visible === true;
  };
}
```

Discussion

Using the `ng-controller` directive we bind the div element including its children to the context of the `MyCtrl` Controller. The `ng-click` directive will call the `toggle()` function of the `MyCtrl` Controller on button click. The controller implementation defaults the `visible` attribute to true and toggles its boolean state in the toggle function. The `ng-show` directive calls the `isVisible()` function to retrieve the boolean state. Note, that you could use the `visible` attribute instead if `isVisible()`. Using a function encapsulates the logic and allows more complex logic.

Create your own directive

Problem

You want to render a Hello World snippet in several places.

Solution

Create a custom directive which renders your Hello World snippet.

```
<body ng-app="MyApp">
  <hello-world/>
</body>
```

The directive implementation:

```
var app = angular.module("MyApp", []);

app.directive("helloWorld", function() {
  return {
    restrict: "E",
    template: '<span>Hello World</span>'
  };
});
```

Discussion

We ignore the module creation for a later recipe for now. The browser will render the `span` element as defined in the directive. Note, that it did not replace the `hello-world` element, but instead inserted the `span`. If you want to replace the content completely you need to return an addditional attribute replace set to the true:

```
app.directive("helloWorld", function() {
  return {
    restrict: "E",
    replace: true,
    template: '<span>Hello World</span>'
  };
});
```

Now the `hello-world` element is not rendered at all and replaced with the `span` element.

Also note the `restrict` attribute is set to `E` which means the directive can be used only as an html element. A full discussion will follow in later chapters.

Controllers

Controllers in Angular handle view behaviour. The user clicking a button or entering some text in a form - what should happen next is implemented in a controller. As a general rule a controller should not reference the DOM directly. This dramatically simplifies unit testing controllers.

Assign default value to model

Problem

You want to assign a default value to the scope in the controllers context.

Solution

```
<div ng-controller="MyCtrl">
  <p>{{value}}</p>
</div>

var MyCtrl = function($scope) {
  $scope.value = "some value";
};
```

Discussion

Depending on where you use the ng-controller directive, you define its assigned scope. The scope is hierachical and follows the DOM nodes hierarchy. In our example the value expression is correctly evaluated to `some value`, since value is set in the `MyCtrl` controller. Note, that this would not work if the value expression is moved outside the controllers scope:

```
<p>{{value}}</p>

<div ng-controller="MyCtrl">
</div>
```

In this case `{{value}}` will simply be not rendered at all.

Change model value with a function

Problem

You want to increment the model value by 1.

Solution

Define a increment function which changes the scope.

```
<div ng-controller="MyCtrl">
  <p ng-init="incrementValue(5)">{{value}}</p>
</div>

function MyCtrl($scope) {
  $scope.value = 1;

  $scope.incrementValue = function(value) {
    $scope.value += 1;
  };
}
```

Discussion

The `ng-init` directive is executed on page load and calls the function defined in `MyCtrl`.

Expose model value with a function

Problem

You want to retrieve a model via function (instead of directly accessing the scope from the template) which further changes the model value.

Solution

Define a getter function which returns the model value.

```
<div ng-controller="MyCtrl">
  <p>{{getIncrementedValue()}}</p>
</div>

function MyCtrl($scope) {
  $scope.value = 1;

  $scope.getIncrementedValue = function() {
    return $scope.value + 1;
  };
}
```

Discussion

`MyCtrl` defines the `getIncrementedValue` function which uses the current value and returns it incremented by one. One could argue that depending on the use case it would make more sense to use a filter. But, there are use cases specific to the controllers behaviour which you might not want to use a generic directive.

Respond to scope changes

Problem

You want to react on a model change to trigger some further actions. In our example we simple want to set another model value depending on the value we are listing on.

Solution

Use the $watch function in your controller.

```
<div ng-controller="MyCtrl">
  <input type="text" ng-model="name" placeholder="Enter your name">
  <p>{{greeting}}</p>
</div>

function MyCtrl($scope) {
  $scope.name = "";

  $scope.$watch("name", function(newValue, oldValue) {
    if ($scope.name.length > 0) {
      $scope.greeting = "Greetings " + $scope.name;
    }
  });
}
```

The value `greeting` will be changed whenever there's a change on the `name` model and the value is not blank.

Discussion

The first argument `name` of the `$watch` function is actually an Angular expression, so you can use more complicated expressions (for example: `[value1, value2] | json`). Alternatively, you can also use a javascript function:

```
$scope.$watch(function() {
  return $scope.name;
}, function() {
  console.log("change detected")
});
```

Note, that you need to return a String in the watcher function. The second function will only be called if the returned String changed compared to the previous execution. Internally this uses `angular.equals` to determine equality.

Testing Controllers

Problem

You want to unit test your business logic.

Solution

Implement a unit testing using Jasmine[1] and the angular-seed[2] bootstrap. Following the case for our $watch use case spec.

```
describe('MyCtrl', function(){
  var scope, ctrl;

  beforeEach(inject(function($injector, $controller, $rootScope) {
    scope = $rootScope.$new();
    ctrl = $controller(MyCtrl, { $scope: scope });
  }));

  it('should change greeting value if name value is changed', function() {
    scope.name = "Frederik";
    scope.$digest();
    expect(scope.greeting).toBe("Greetings Frederik");
  });
});
```

Discussion

Jasmine specs use `describe` and `it` functions to group specs and `beforeEach` and `afterEach` to setup and teardown code. The actual expectation compares the greeting from the scope with our expectation `Greetings Frederik`.

The scope and controller initialization is a bit more involved. We use `inject` to initialize the scope and controller as close as possible to how our code would behave at runtime too. We can't just initialize scope as an javascript object `{}` since then we would not be able to call `$watch` on it. Note, the `$digest` call which is required in order for another watch execution.

[1] http://pivotal.github.com/jasmine/

[2] https://github.com/angular/angular-seed

Directives

Show/Hide DOM nodes

Disable/Enable DOM nodes

Implement DOM changes in response to user behaviour

Use different types of directives in template

Replace whole directive children content

Use directive child content in directive output

Use compile and link function and why distinguish between them

Testing directives

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Format numeric input with decimal marks

create format date/time filter using moment.js

filter with argument

test filter implementation

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Use $resource for RESTful APIs calls (Using mongolab as example service)

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