AngularJS

Beginner's guide - part 2

POLITECNICO
DI TORINO

e-Lite

Summary of the previous lesson

1. To add AngularJS to an empty page:
   a) Download the script `angular.js` from https://angularjs.org/
   b) Link it in the header

```
<script src=
"https://ajax.googleapis.com/ajax/libs/angularjs/1.6.4/angul
ar.min.js" ></script>
```

   c) Add the `ng-app` directive to the portion of the page that AngularJS should process

```
<html lang="en" ng-app>
...
```

Summary of the previous lesson

2. To create a controller that implements the logic of your app:
   a) Declare the module in your HTML page

```
<html lang="en" ng-app="sonetExample" >
```

   b) Create a JavaScript file (example.js) containing the module and the controller declaration

```
angular.module("sonetExample", [])
 .controller('MyCtrl', function ($scope) {
    //do something
})
```

Summary of the previous lesson

c) Link it in the HTML header

```
<script src= "./example.js" ></script>
```

d) Use the ng-controller directive to say to AngularJS in which part of the page it should be used

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

e) Modify the script (example.js) to actually implement the controller actions

```
angular.module("sonetExample", [] )
 .controller('MyCtrl', function ($scope) {
    $scope.name = "Teo";
})
```

Summary of the previous lesson

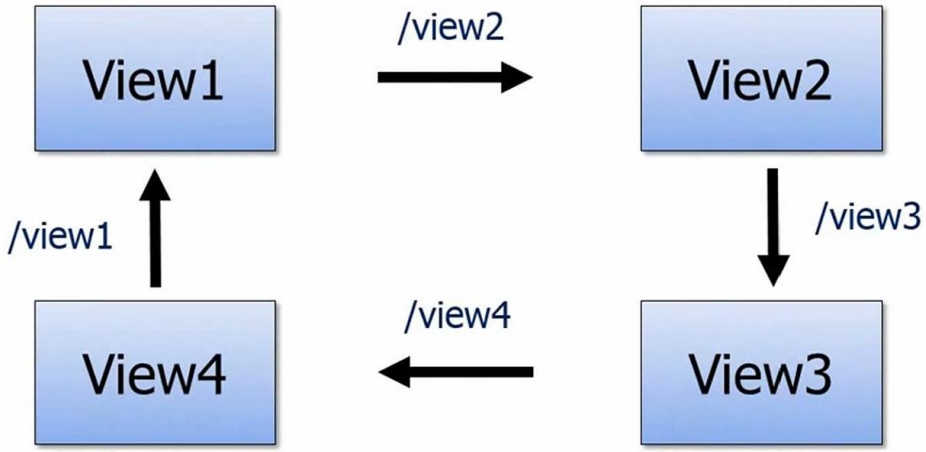
3. To share data between the controller and the view:
   - Use the $scope

```
angular.module("sonetExample", [])
 .controller('MyCtrl', function ($scope) {
    ...
})
```

→ Example 5 and 6

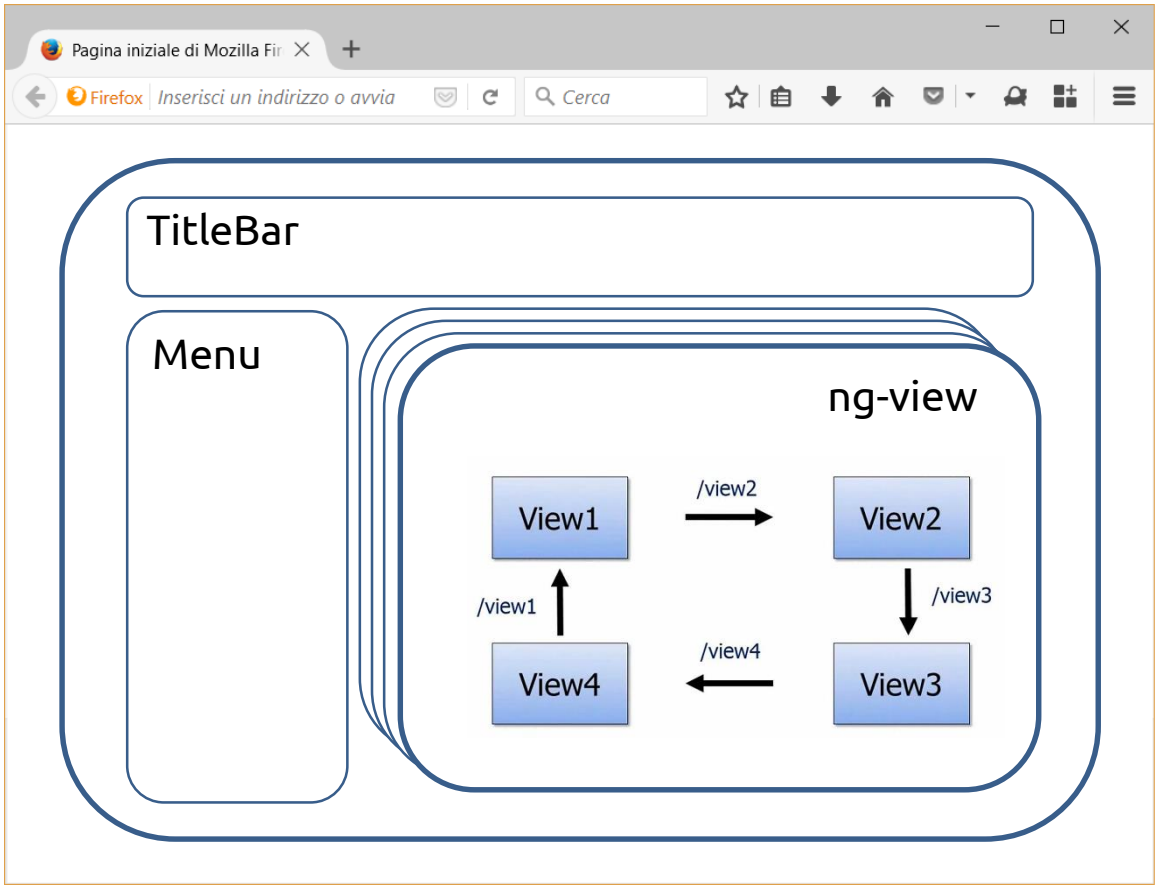
Routing

- Single page applications need routing
  - to mimic static addresses (http://mysite.com/...)
  - to manage browser history
- Goal: load different views into the single page app



Routing in AngularJS

- Goal: load different views into a portion of the single page app



How: ngRoute

- Angular API for routing
- Provides
  - a directive to indicate where view component should be inserted in the template (`ngView`)
  - a service that watches `window.location` for changes and updates the displayed view (`$route`)
  - a configuration that allows the user to specify the URL to be used for a specific view (`$routeProvider`)
- It is located in a dedicated js file
  - `angular-route.min.js`

How to use ngRoute

- In a template

```
<div ng-view></div>
```

- In your Angular module, add ngRoute as a dependency

```
angular.module('sonetExample', [ngRoute])
```

  - Now our application has access to the route module, which provides the $routeProvider

- Configure the routing table in a **config** block

```
.config(['$routeProvider',
   function($routeProvider) {
   …
}])
```

→ Example 7

How to use ngRoute

- In a template

```
<div ng-view>
```

- In your Angula
  dependency

Every time we use an external module we have to specify it in the module **dependencies**

```
angular.module('sonetExample', [ngRoute])
```

  - Now our application has access to the route module, which provides the $routeProvider

- Configure the routing table in a **config** block

```
.config(['$routeProvider',
   function($routeProvider) {
   …
}])
```

→ Example 7

How to use ngRoute

- In a template

```
<div ng-vie
```

- In your Angu
dependency

```
angular.mod
```

  - Now our ap dule, which provides the $routeProvider

Dependencies are important for other components, too! In this case we have to use methods provided by the routeProvider, so we declare its dependency

- Configure the routing table in a **config** block

```
.config(['$routeProvider',
   function($routeProvider) {
   …
}])
```

→ Example 7

How to use ngRoute: Example7

- example7.html:

```
<!DOCTYPE html>
<html lang="en" ng-app="sonetExample7">
<head>
    <meta charset="UTF-8">
    <title>Routing and Views</title>
    <script src="./angular.min.js"></script>
    <script src="./angular-route.min.js"></script>
    <script src="./example7.js"></script>
</head>

<body>
    <div ng-view></div>
</body>
</html>
```

How to use ngRoute: Example7

- enter-name.html:

```
<div>
    <label>Name</label>
    <input type="text" ng-model="name" placeholder="Enter
your name">
    <h1>{{ greeting }} {{name}}!</h1>
</div>
```

How to use ngRoute: Example7

- example7.js:

```
angular.module("sonetExample7", ['ngRoute'])

.config(['$routeProvider', function ($routeProvider) {
    $routeProvider
        .when('/name', {
            templateUrl: 'enter-name.html',
            controller: 'MyCtrl'
        })
        .otherwise({redirectTo: '/name'});
}])

.controller('MyCtrl', function ($scope) {
    $scope.name = "";
    $scope.greeting = "Ciao";
});
```

How to use ngRoute: Example7

- example7.js:

```
angular.module("sonetExample7", ['ngRoute'])

.config(['$routeProvider', function ($routeProvider) {
    $routeProvider
        .when('/name', {
            templateUrl: 'enter-name.html',
            controller: 'MyCtrl'
        })
        .otherwise({redirectTo: '/name'});
}])

.controller('MyCtrl', fu
    $scope.name = "";
    $scope.greeting = "C
});
```

Here the **controller** is specified in an internal method

Passing parameters in URLs

URLs:

- #/pizzas/my-pizza
- #/pizzas/another-pizza

Routing table configuration:

JS

```
.config(['$routeProvider', function ($routeProvider){
  $routeProvider
    .when('/pizzas/:pizzaId', {
      templateUrl: 'single-pizza.html',
      controller: 'PizzaCtrl',
    })
    [...]
}])
```

Passing parameters in URLs

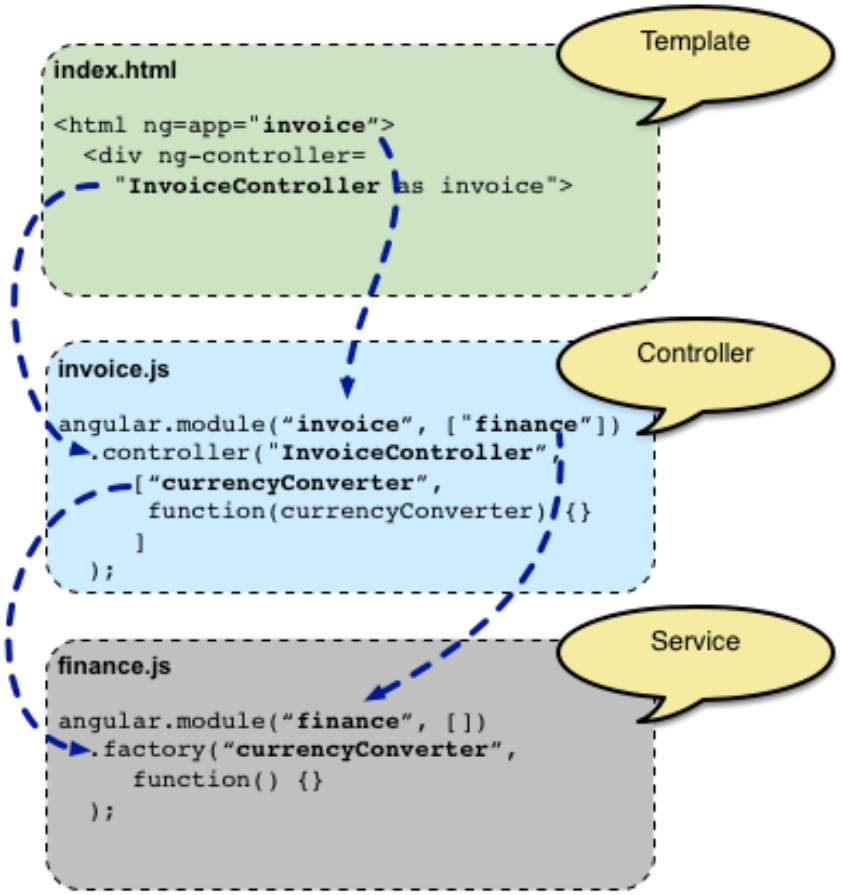
Controller:

JS

```
.controller('PizzaCtrl', ['$routeParams',
  function ($routeParams) {
    $routeParams.pizzaId
    // will be my-pizza or another-pizza
})
```

Services

- Responsible to hold the model and communicate with a server
- Singleton objects that are instantiated only once per app and lazy loaded
  - controllers are instantiated only when they are needed and discarded otherwise



Built-in Services

- Server communication
  - $http, $resource, …
- Wrapping DOM access
  - $location, $window, $document, …
- JavaScript functionality
  - $animate, $log, …

The $http Service

- Uses the XMLHttpRequest object (or JSONP) to communicate with a server
- How it works
  - takes a single argument: a configuration object
  - returns a promise with two methods: `success()` and `error()`
- It can use the `.then()` method, too
  - it registers a dedicated callback for the success and error method

The $http Service

promise

JS

```
$http({
    method: 'GET',
    url: '/someUrl'})
   .success(function(data, status, headers, config) {
     // this callback will be called asynchronously
     // when the response is available
   })
   .error(function(data, status, headers, config) {
     // called asynchronously if an error occurs
     // or server returns response with an error status.
   });
});
```

callbacks

The $http Service

- Shortcut methods

JS

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

sonet.controller('MyCtrl', ['$scope', '$http',
    function ($scope, $http) {
        var promise = $http.get('/pizzas.json');
        promise.success(function(data) {
            $scope.pizzas = data;
        });
    }
]);
```

Shortcut methods:
.get(), .post(), .put(), .delete(), etc.

$http in a Custom Service

JS

```
// custom service
sonet.factory('Pizza', function($http) {
    var pizzaService = {
        getData: function () {
            return $http.get('/pizzas.json')
              .then(function (response) {
                return response.data;
            });
        }
    };
    return pizzaService;
})

// controller
sonet.controller('PizzaCtrl', ['$scope', 'Pizza',
    function ($scope, Pizza) {
        Pizza.getData().then(function(pizzaList) {
            $scope.pizzas = pizzaList;
        });
    }
]);
```

→ Example 8

The $resource Service

- Replace the "low level" $http service
  - it has methods with high-level behaviors
  - but the server URLs must be RESTful
- REST: REpresentational State Transfer
  - works on the concept of “resource”
- CRUD: Create, Read, Update and Delete

read a collection of resources:	GET /pizzas
read a single resource:	GET /pizzas/:id
add a new resource:	POST /pizzas
update an existing resource:	PUT /pizzas/:id
delete an existing resource:	DELETE /pizzas/:id

The $resource Service

- Requires the ngResource module to be installed
- No callbacks needed!
  - e.g., `$scope.pizzas = pizzaService.query();`
- Available methods
  - get(), method: GET, single resource
  - query(), method: GET, is array (collection)
  - save(), method: POST
  - remove(), method: DELETE,
  - delete(), method: DELETE

Other best practices in AngularJS

BEST PRACTICES

A dot in the model

"There should always be a dot in your model"

Parent scope: `$scope.name = "Anon"`
Child scope: `<input type="text" ng-model="name">`

The application will display "*Anon*" initially, but once the user changes the value a *name* will be created on the child scope and the binding will read and write that value.
The parent's name will remain "*Anon*".
This can cause problems in large applications.
To avoid them:

```
<input type="text" ng-model="person.name">
```

camelCase vs dash-case

You can use variable named like

```
my-variable
myVariable
```

- The latter can cause problems in HTML
  - it is case-insensitive
- Angular solution: use either, it will map them to the same thing

Use dash-case in HTML and camelCase in JavaScript

ADDITIONAL INFORMATION

Custom Directives

- Application specific
  - replace HTML tags with “functional” tags you define e.g., DatePicker, Accordion, ...
- Naming
- Camel case naming (`ngRepeat`)
  - automatically mapped to `ng-repeat`, `data-ng-repeat` in the templates
    e.g., `<div ng-repeat></div>`

Custom Directives

- A directive returns an “object” (directive definition) with several properties
  - details: https://docs.angularjs.org/api/ng/service/$compile

JS

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

sonet.directive('helloHeader', function() {
    return {
        restrict: 'E',
        template: '<h2>Hello World!</h2>'
    };
});
```

Custom Directives

JS

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

sonet.directive('helloHeader', function() {
    return {
        restrict: 'E',
        template: '<h2>Hello World!</h2>'
    };
});
```

Restricts the directive to a specific HTML "item".
If omitted, the defaults (Elements and Attributes) are used.

Custom Directives

JS

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

sonet.directive('helloHeader', function() {
    return {
        restrict: 'E',
        template: '<h2>Hello World!</h2>'
    };
});
```

replace or wrap the contents of an element with this template

Compile and Link

- Named after the two phases Angular uses to create the live view for your application
- Compile
  - looks for all the directives and transforms the DOM accordingly, then calls the compile function (if it exists)
- Link
  - makes the view dynamic via directive link functions
  - the link functions typically create listeners on the DOM or the model; these listeners keep the view and the model in sync at all times
  - scopes are attached to the compiled link functions, and the directive becomes live through data binding

Link Function: Example

JS

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

sonet.directive('backButton', ['$window', function ($window) {
    return {
        restrict: 'A',
        link: function (scope, elem, attrs) {
            elem.bind('click', function () {
                $window.history.back();
            });
        }
    };
}])
```

References

- AngularJS official guide
  - https://docs.angularjs.org/guide
- AngularJS API documentation
  - https://docs.angularjs.org/api
- AngularJS in 60 minutes [video]
  - https://www.youtube.com/watch?v=i9MHigUZKEM
- Learn Angular in your browser
  - http://angular.codeschool.com/

01QYAPD Social Networking: technologies and applications

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