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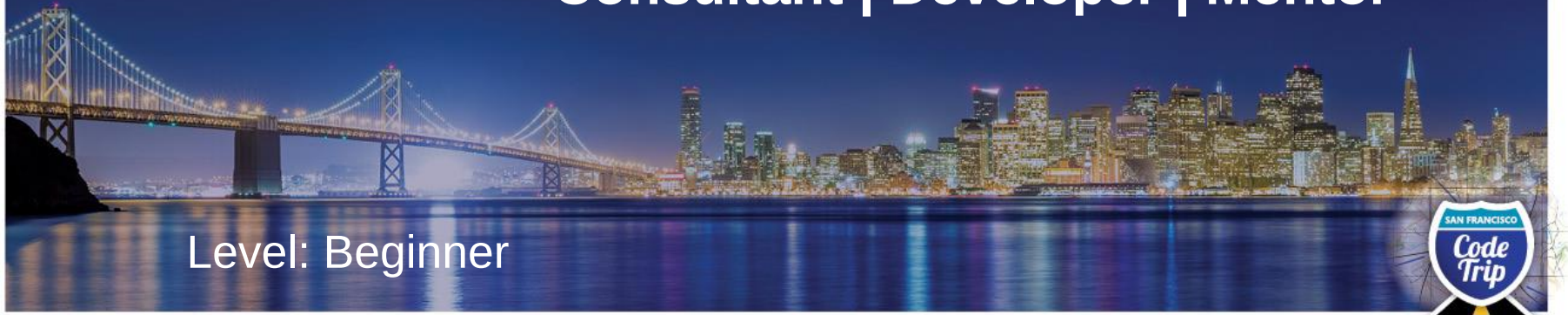
San Francisco

Angular 101

Deborah Kurata

Consultant | Developer | Mentor



Level: Beginner

SAN FRANCISCO Code Trip
NAVIGATE THE .NET HIGHWAY

Deborah Kurata

- Independent Consultant | Developer | Mentor
  - Web (Angular), .NET
- Pluralsight Author
  - AngularJS Line of Business Applications
  - Angular Front to Back with Web API
  - Object-Oriented Programming Fundamentals in C#
- Microsoft MVP

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Session Materials & Sample Code

https://github.com/DeborahK/VSLive2015-SF

Rate Yourself on Angular

- New to Angular - no proficiency
- Just starting out - limited proficiency
- Doing it, not fully understanding it - working proficiency
- Been there, done that, can help others - full proficiency

Overview

- Introduction to Angular
- Angular and HTML: Building a View
- Data Binding
- Angular Code: Building the Module & Controller
- Bootstrap: Styling the View
- Rule-based Navigation: Routing
- Retrieving Data via HTTP Service

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ANGULARJS by Google

- A client-side JavaScript framework for building interactive Web applications
- Brings simple/clean back to complex Web apps
- Originally developed by Google
- Now open source: https://angularjs.org/

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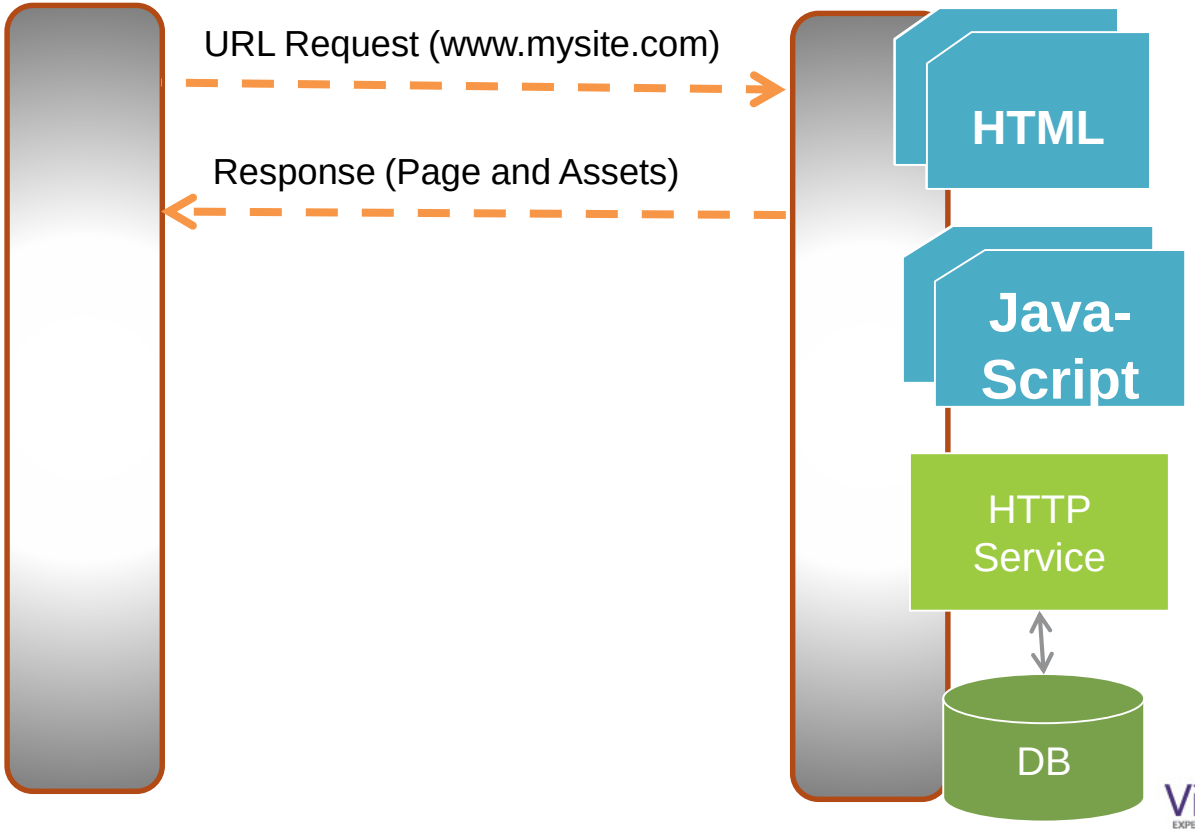
DEMO:
ANGULAR APPS

Web Browser

Web Server



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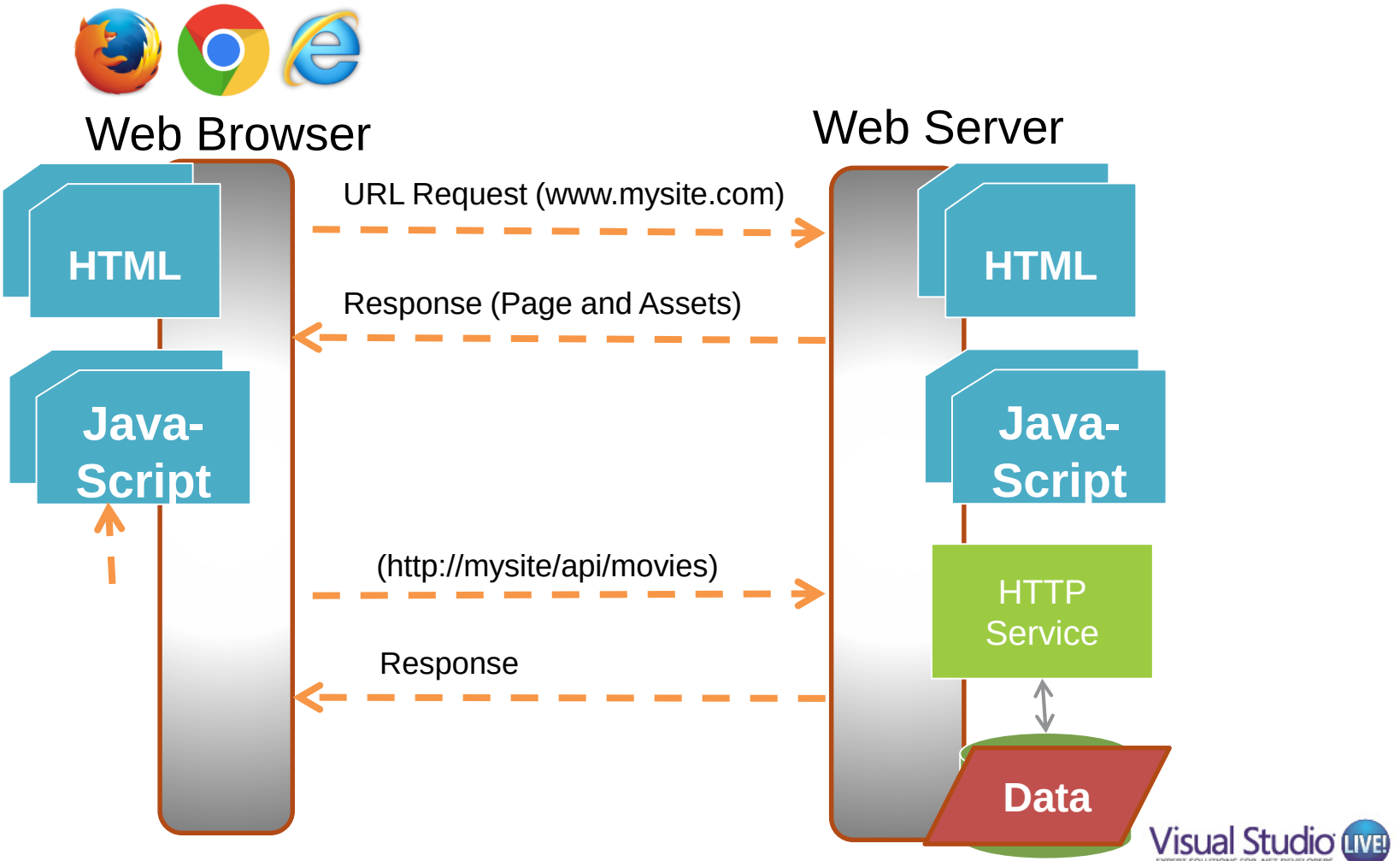
Web Browser
Web Server
HTML
Java-Script
URL Request (www.mysite.com)
Response (Page and Assets)
HTML
Java-Script
(http://mysite/api/movies)
HTTP Service
Response
Data

Why Angular?

Expressive HTML

Powerful Data Binding

Modularity

Rule-based Navigation

Easily Call HTTP Service

Testable

It's Popular

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Movie List View

Expressive HTML

```
<div ng-controller="MovieListCtrl">
 <div>{{title}}</div>
 <div>Filter by:</div><input type="text" ng-model="listFilter" />

 <div ng-show="listFilter">
    <h3>Movies filtered by: {{listFilter}}</h3>
 </div>
```

```
 <table ng-if="movies.length">
   <thead>
        <tr>
            <td><button type="button"
                        ng-click="toggleImage()">
                    {{showImage ? "Hide" : "Show"}} Poster
                </button></td>
            <td>Title</td> <td>Director</td> <td>Release Date</td> <td>Rating</td>
        </tr>
   </thead>
```

```
   <tbody>
    <tr ng-repeat="movie in movies | filter : {title:listFilter} | orderBy : 'title'">
            <td><img ng-show="showImage"
                     ng-src="{{movie.imageurl}}" title="{{movie.title}}"></td>
            <td>{{ movie.title}}</td>
            <td>{{ movie.director }}</td>
            <td>{{ movie.releaseDate | date }}</td>
            <td>{{ movie.mpaa | uppercase}}</td>
    </tr>
   </tbody>
 </table>
</div>
```

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Directives

Expressive HTML

- Extend HTML
  - Apply special behavior to attributes or elements in the HTML
  - Are simple to define in the HTML
    - Prefixed with "ng-"
- Provide an extensive set of features and capabilities

Directives

```
<body ng-app="movieHunter">

<table ng-if="movies.length">

<tr ng-repeat="movie in movies | orderBy:'title' ">

<img ng-show="showImage"
     ng-src="" />

<button type="button"
        ng-click="toggleImage()">Poster
</button>
```

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One Way Data Binding

Powerful Data Binding

- View is a projection of the model
  - When the model changes, the view reflects the change
- Binding Expression
    - {{movie.title}}

One Way Data Binding

```
<tr ng-repeat="movie in movies | orderBy:'title' ">
   <td>
      <img ng-show="showImage"
           ng-src="{{movie.imageurl}}" />
   </td>
   <td>
      <a>{{movie.title}}</a>
   </td>
   <td>{{movie.director}}</td>
   <td>{{movie.date | date}}</td>
   <td>{{movie.mpaa | uppercase}}</td>
</tr>
```

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Two Way Data Binding

Powerful Data Binding

- Data in the model and the view are synchronized
  - Changes to the model are reflected in the view
  - Changes in the view are reflected in the model
- Define using a directive: ng-model
    - ng-model="listFilter"

Two Way Data Binding

```
<div>
   <div>Filter by:</div>
   <div>
      <input type="text" ng-model="listFilter" />
   </div>
</div>

<div ng-show="listFilter">
   <h3>Movies filtered by: {{listFilter}}</h3>
</div>

<tr ng-repeat="movie in movies | orderBy:'title'
                               | filter : {title : listFilter}">
```

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Building a View

- Directives
  - ng-app, ng-if, ng-repeat, …
- Data Binding
  - One way binding
    - {{movie.title}}
  - Two way binding
    - ng-model="listFilter"

Expressive HTML

Powerful Data Binding

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Angular Code

Modularity

- Write using
  - JavaScript
  - TypeScript
- Divided into
  - Modules
  - Controllers
  - Services

Module

Defines an Angular component

Tracks the code

Tracks the dependencies

Keeps the application modularized

Angular Module Method

Setter Method

```
angular.module("movieHunter", ["ngRoute",
                               "common.services"]);
```

Getter Method

```
angular.module("movieHunter");
```

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Angular Main Module

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

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Angular Main Module

```
function () {
    var app = angular.module("movieHunter",
                                    []);
}
```

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Angular Main Module - IIFE

```
(function () {
    var app = angular.module("movieHunter",
                                    []);
}());
```

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The IIFE JavaScript Pattern

- Immediately-Invoked Function Expression
- JavaScript var declarations have global scope
- JavaScript variables and functions defined within a function have local scope

```
(function () {
    // Code here


}());
```

Module

- One "main" module for the application
- Any number of additional modules
  - Group related functionality
  - Define reusable common code

Controller

Defines the Model

- Movies

Implements Methods

- Hide/Show Images

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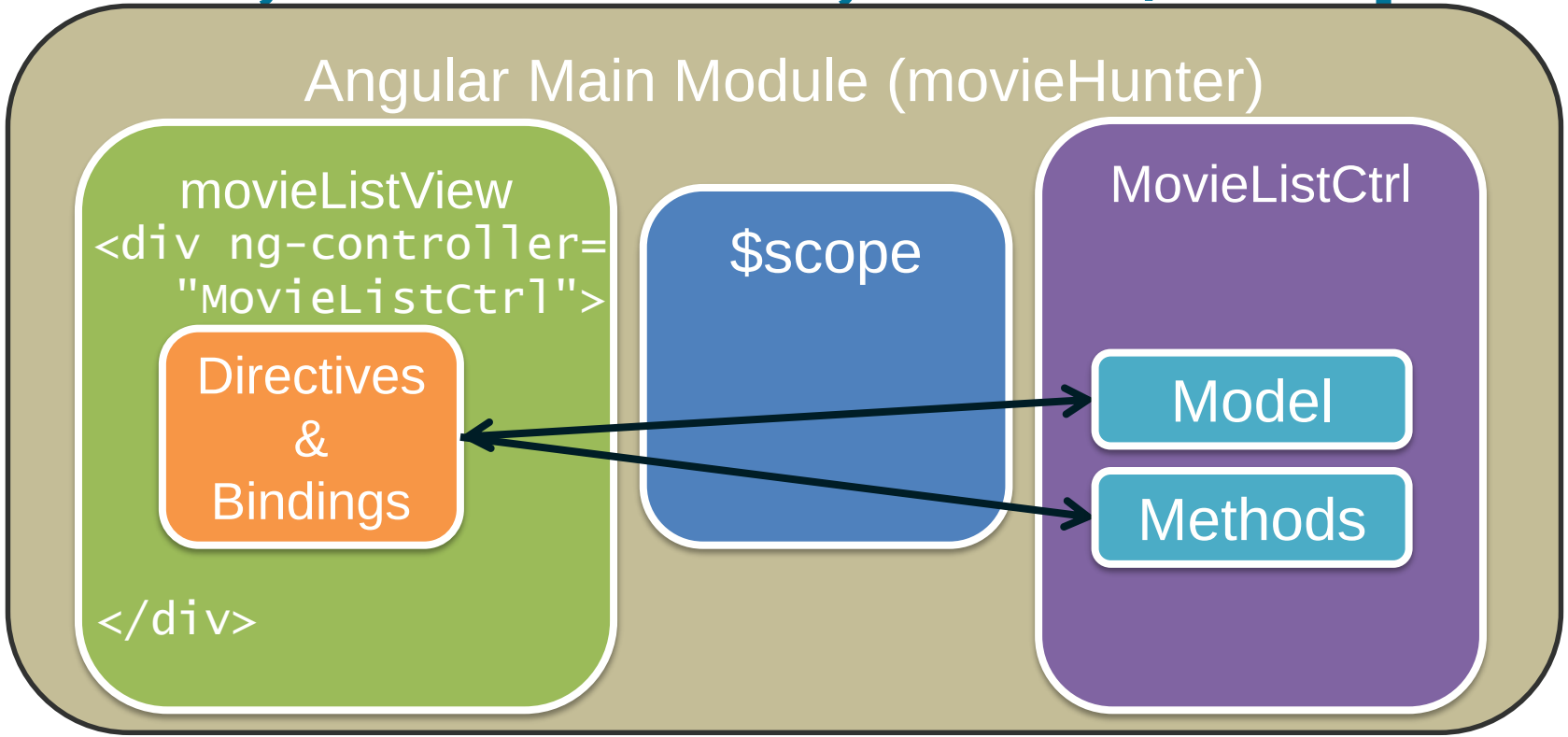
View, Controller, and $scope



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Angular Controller

```
(function () {
    angular
        .module("movieHunter")
        .controller("MovieListCtrl",
                    ["$scope",
                     MovieListCtrl]);

    function MovieListCtrl($scope) {

        $scope.movies = [];
        $scope.title = "Search by Movie Title";
        $scope.showImage = false;

        $scope.toggleImage = function () {
            $scope.showImage = !$scope.showImage;
        };

}());
```

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"Controller As" Syntax

```
(function () {
    angular
        .module("movieHunter")
        .controller("MovieListCtrl",
                    ["$scope",
                     MovieListCtrl]);

    function MovieListCtrl($scope) {

        $scope.movies = [];
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        $scope.toggleImage = function () {
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        };

}());
```

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"Controller As" Syntax

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(function () {
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    function MovieListCtrl() {

        $scope.movies = [];
        $scope.title = "Search by Movie Title";
        $scope.showImage = false;

        $scope.toggleImage = function () {
            $scope.showImage = !$scope.showImage;
        };

}());
```

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"Controller As" Syntax

```
(function () {
    angular
        .module("movieHunter")
        .controller("MovieListCtrl",
                    [MovieListCtrl]);

    function MovieListCtrl() {
        var vm = this;
        $scope.movies = [];
        $scope.title = "Search by Movie Title";
        $scope.showImage = false;

        $scope.toggleImage = function () {
            $scope.showImage = !$scope.showImage;
        };

}());
```

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"Controller As" Syntax

```
(function () {
    angular
        .module("movieHunter")
        .controller("MovieListCtrl",
                    [MovieListCtrl]);

    function MovieListCtrl() {
        var vm = this;
        vm.movies = [];
        vm.title = "Search by Movie Title";
        vm.showImage = false;

        vm.toggleImage = function () {
            vm.showImage = !vm.showImage;
        };

}());
```

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View "Controller As" Syntax

```
<div ng-controller="MovieListCtrl">
 <div>{{title}}</div>
 <div>Filter by:</div><input type="text" ng-model="listFilter" />

 <div ng-show="listFilter">
    <h3>Movies filtered by: {{listFilter}}</h3>
 </div>

 <table ng-if="movies.length">
   <thead>
        <tr>
            <td><button type="button"
                        ng-click="toggleImage()">
                    {{showImage ? "Hide" : "Show"}} Poster
                </button></td>
            <td>Title</td> <td>Director</td> <td>Release Date</td> <td>Rating</td>
        </tr>
   </thead>
   <tbody>
    <tr ng-repeat="movie in movies | filter : {title:listFilter} | orderBy : 'title'">
            <td><img ng-show="showImage"
                     ng-src="{{movie.imageurl}}" title="{{movie.title}}"></td>
            <td>{{ movie.title}}</td>
            <td>{{ movie.director }}</td>
            <td>{{ movie.releaseDate | date }}</td>
            <td>{{ movie.mpaa | uppercase}}</td>
    </tr>
   </tbody>
 </table>
</div>
```

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View "Controller As" Syntax

```
<div ng-controller="MovieListCtrl as vm">
 <div>{{title}}</div>
 <div>Filter by:</div><input type="text" ng-model="listFilter" />

 <div ng-show="listFilter">
    <h3>Movies filtered by: {{listFilter}}</h3>
 </div>

 <table ng-if="movies.length">
   <thead>
        <tr>
            <td><button type="button"
                        ng-click="toggleImage()">
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                </button></td>
            <td>Title</td> <td>Director</td> <td>Release Date</td> <td>Rating</td>
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    </tr>
   </tbody>
 </table>
</div>
```

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View "Controller As" Syntax

```
<div ng-controller="MovieListCtrl as vm">
 <div>{{vm.title}}</div>
 <div>Filter by:</div><input type="text" ng-model="listFilter" />

 <div ng-show="listFilter">
    <h3>Movies filtered by: {{listFilter}}</h3>
 </div>

 <table ng-if="vm.movies.length">
   <thead>
        <tr>
            <td><button type="button"
                    ng-click="vm.toggleImage()">
                {{vm.showImage ? "Hide" : "Show"}} Poster
            </button></td>
            <td>Title</td> <td>Director</td> <td>Release Date</td> <td>Rating</td>
        </tr>
   </thead>
   <tbody>
    <tr ng-repeat="movie in vm.movies | filter : {title:listFilter} | orderBy : 'title'">
            <td><img ng-show="vm.showImage"
                    ng-src="{{movie.imageurl}}" title="{{movie.title}}"></td>
            <td>{{ movie.title}}</td>
            <td>{{ movie.director }}</td>
            <td>{{ movie.releaseDate | date }}</td>
            <td>{{ movie.mpaa | uppercase}}</td>
    </tr>
   </tbody>
 </table>
</div>
```

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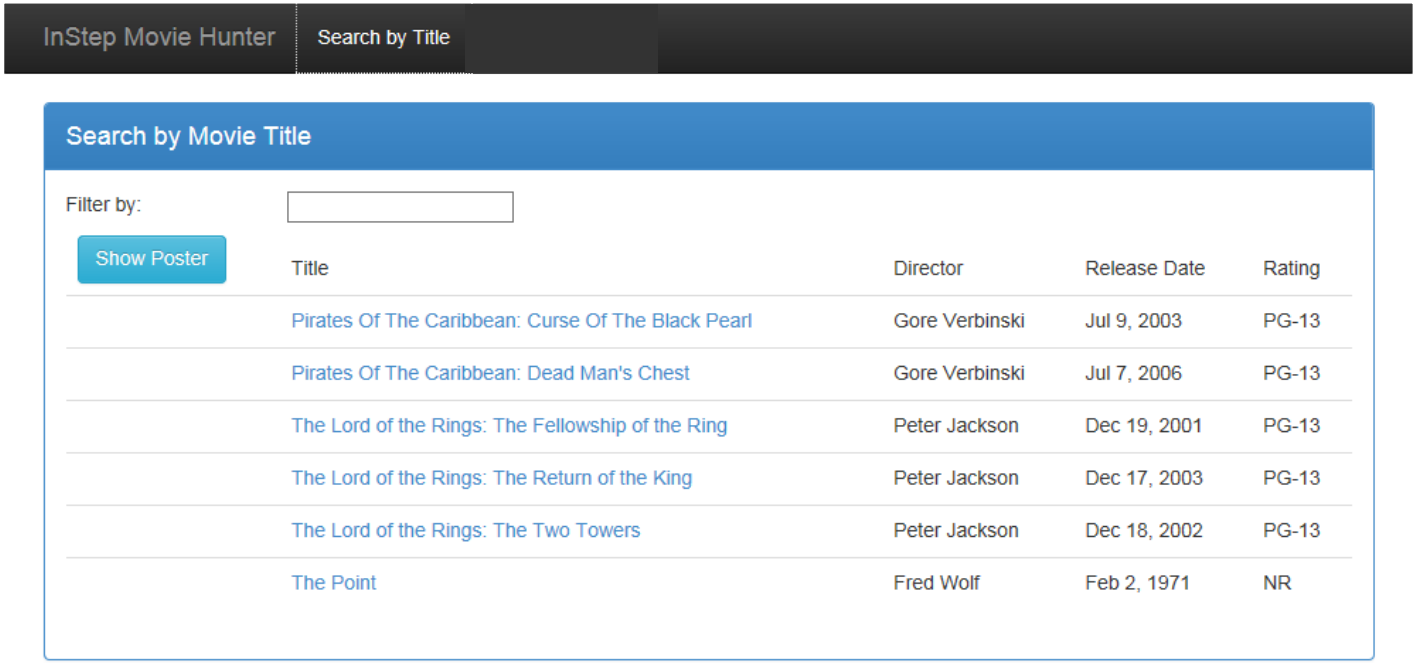
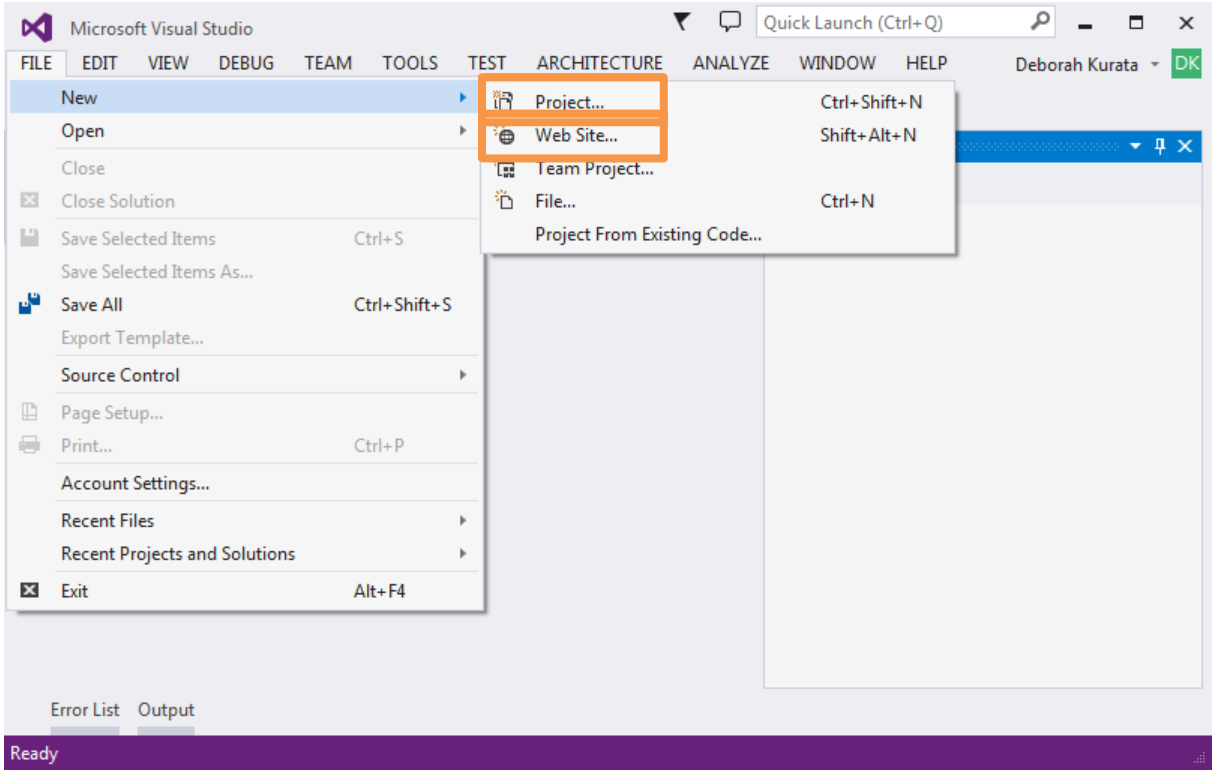
Sample Application



Creating an Angular Project



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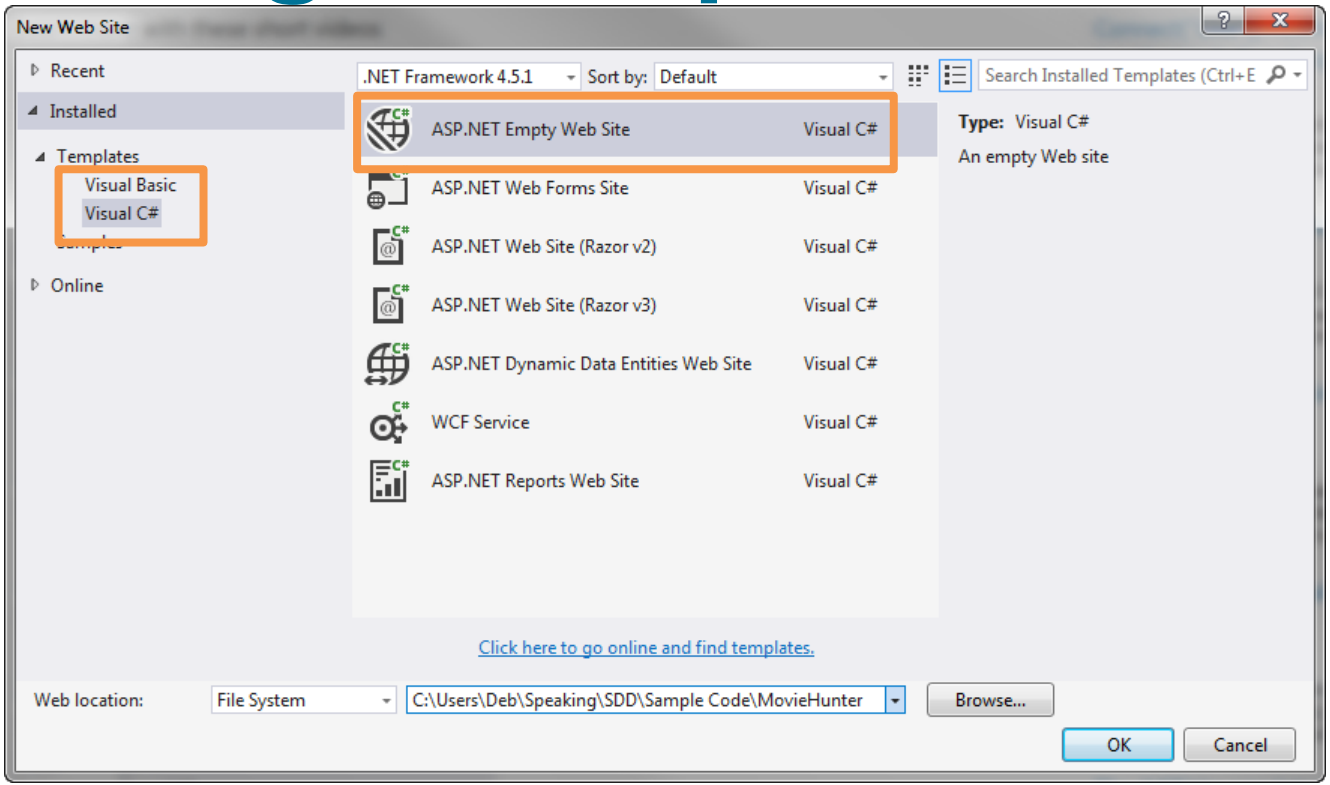
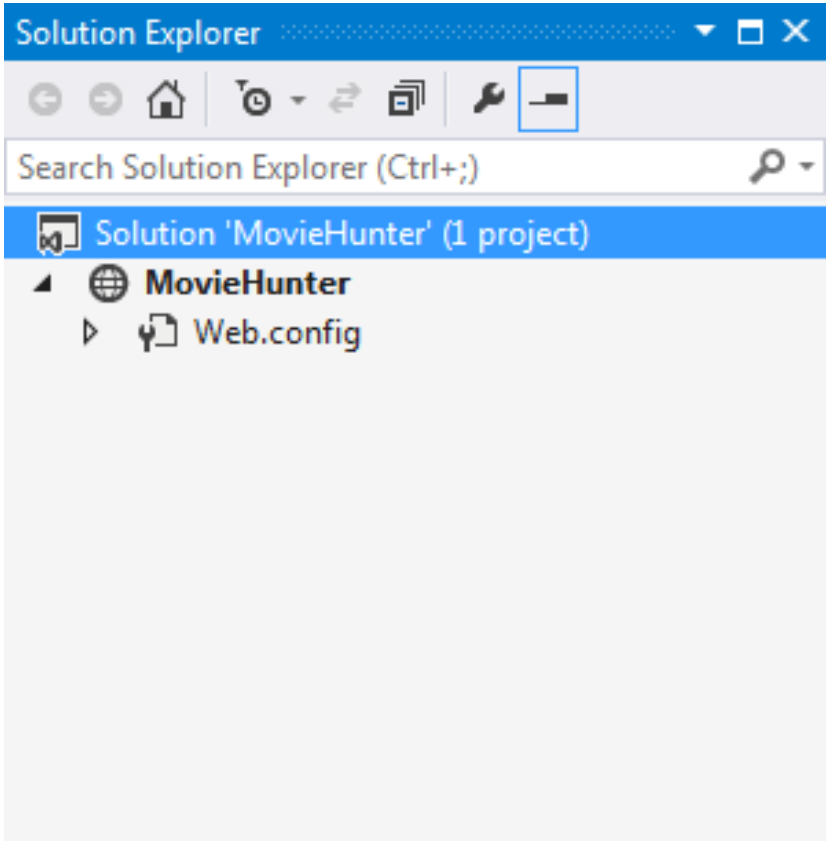
Selecting a Template



Generated Solution



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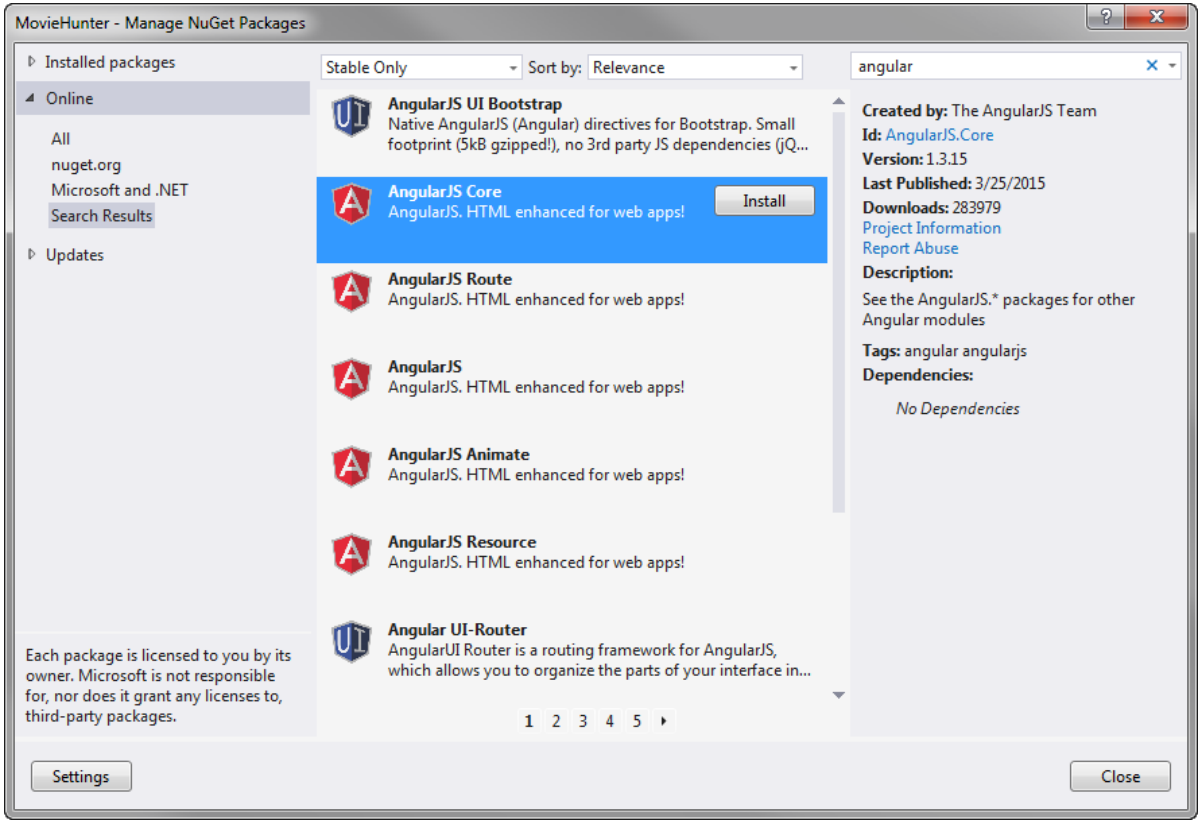
NuGet Package Manager



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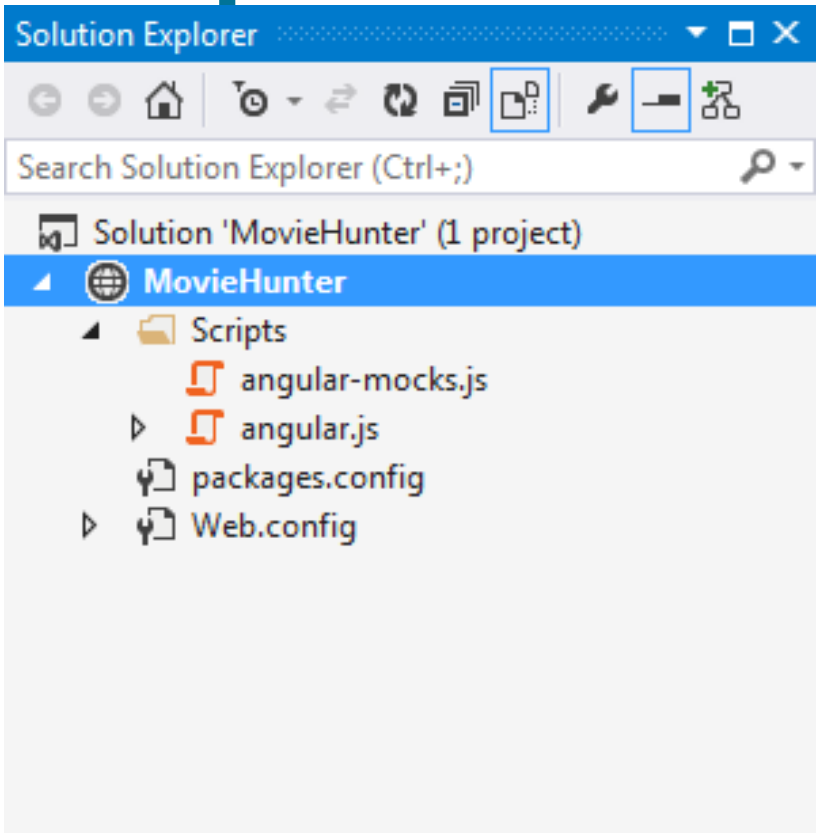
Solution Explorer



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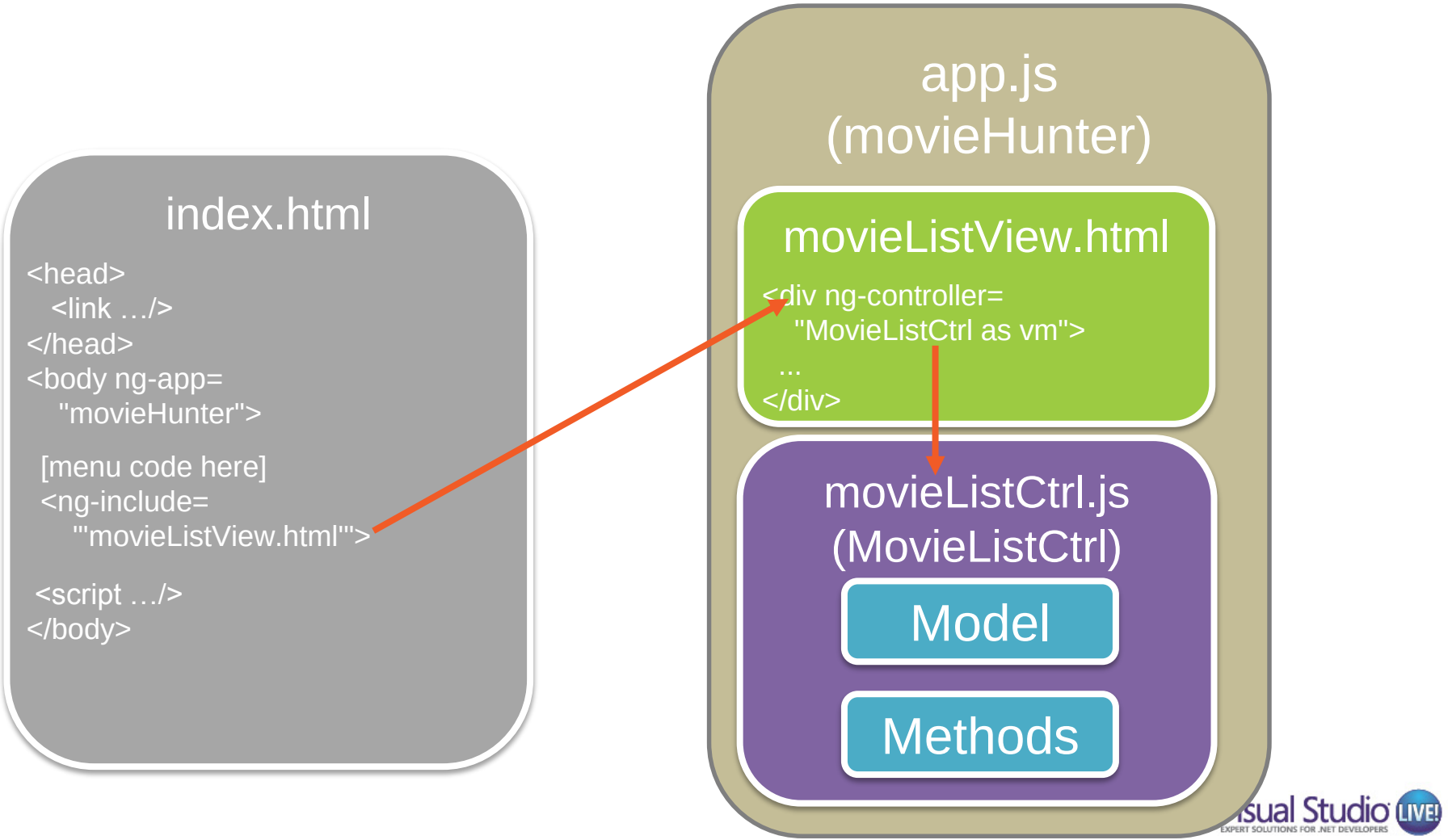
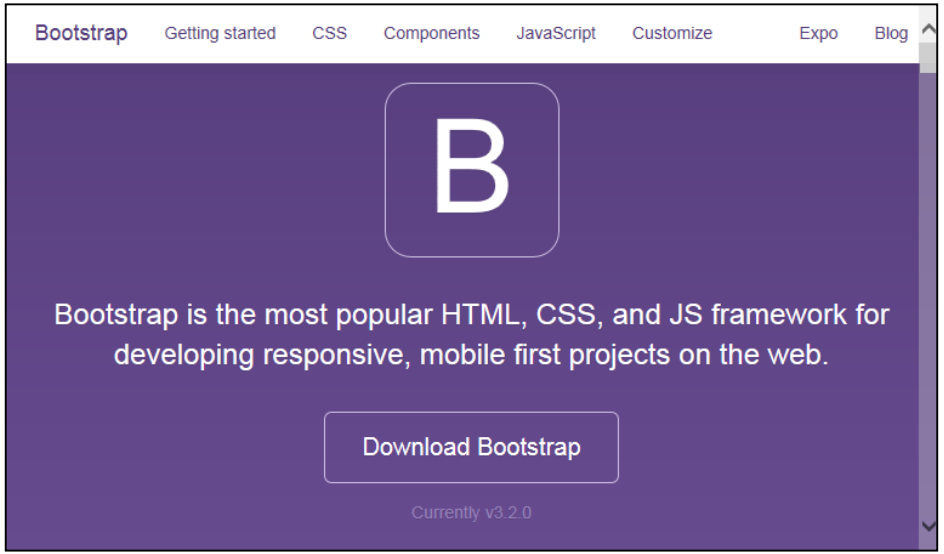

index.html
<head>
<link …/>
</head>
<body ng-app=
"movieHunter">
[menu code here]
<ng-include=
'"movieListView.html"'>
<script …/>
</body>
app.js
(movieHunter)
movieListView.html
<div ng-controller=
"MovieListCtrl as vm">
...

movieListCtrl.js
(MovieListCtrl)
Model
Methods

DEMO:
ANGULAR CODE SO FAR

Bootstrap

- Framework for prettifying Web pages
- Developed by Twitter
  - http://getbootstrap.com/
- Large third party community



Bootstrap Grid System

.col-md-1	.col-md-1	.col-md-1	.col-md-1	.col-md-1	.col-md-1	.col-md-1	.col-md-1	.col-md-1	.col-md-1	.col-md-1	.col-md-1
.col-md-8								.col-md-4			
.col-md-4				.col-md-4				.col-md-4			
.col-md-6						.col-md-6					

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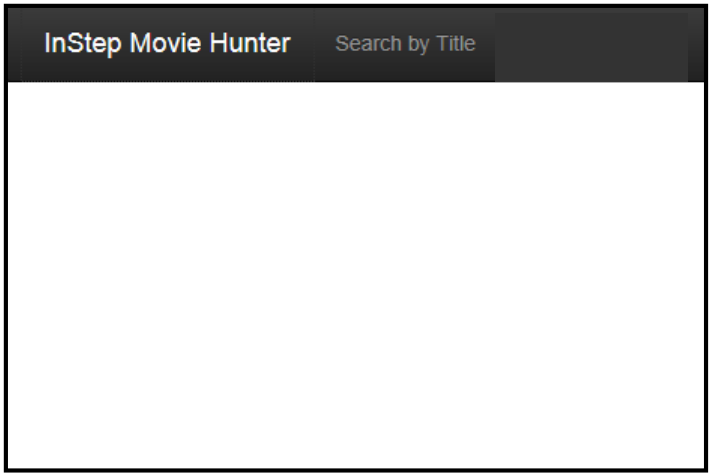
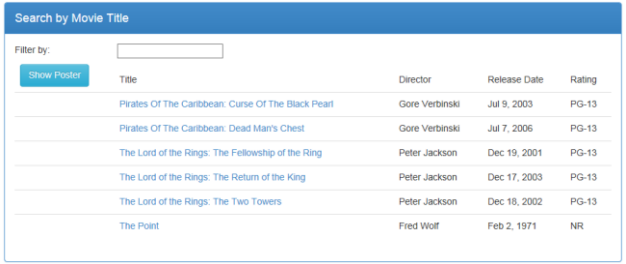
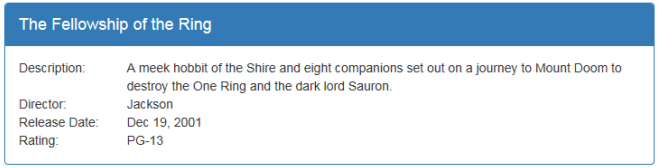
DEMO: BOOTSTRAP

Multiple Views

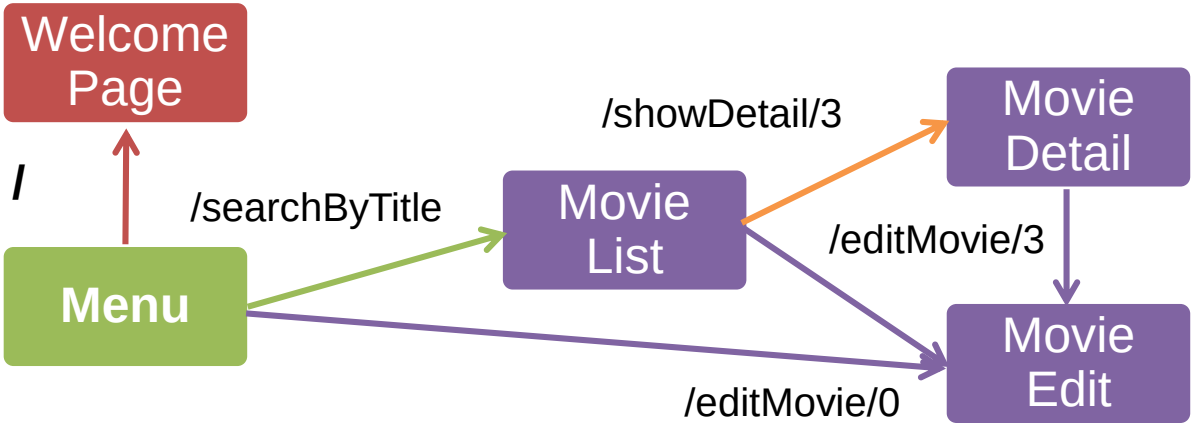
Rule-based Navigation







Routes



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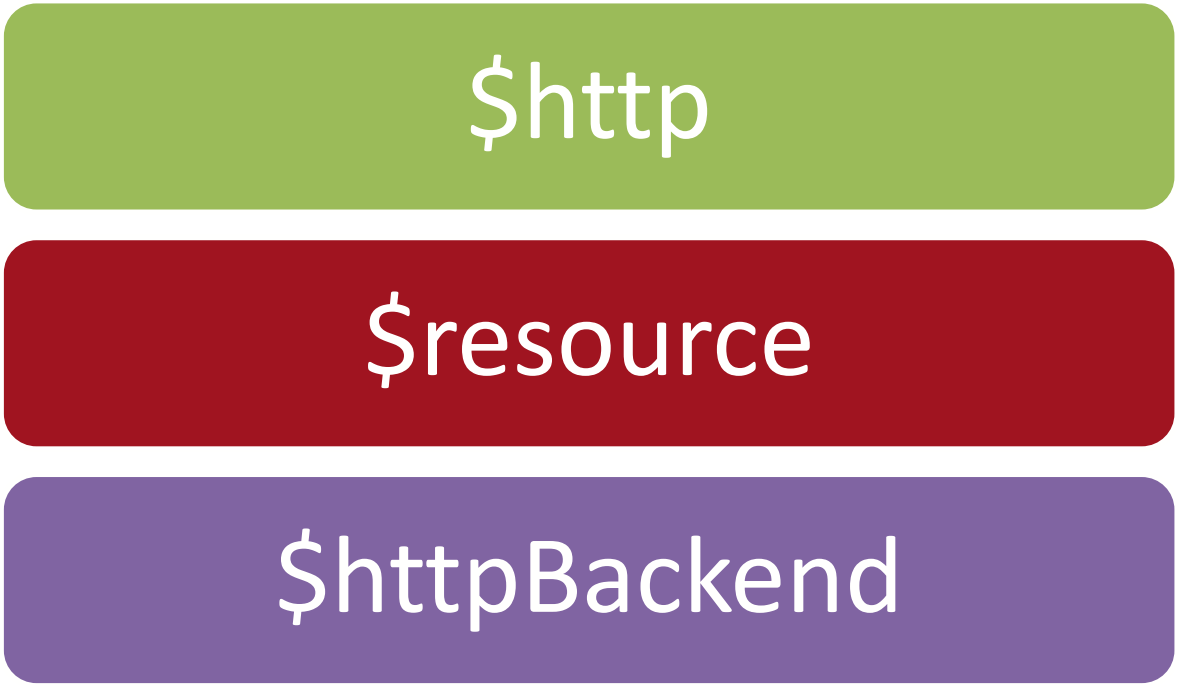
Routing Frameworks

ngRoute

UI Router

DEMO: ROUTING

Calling HTTP Service



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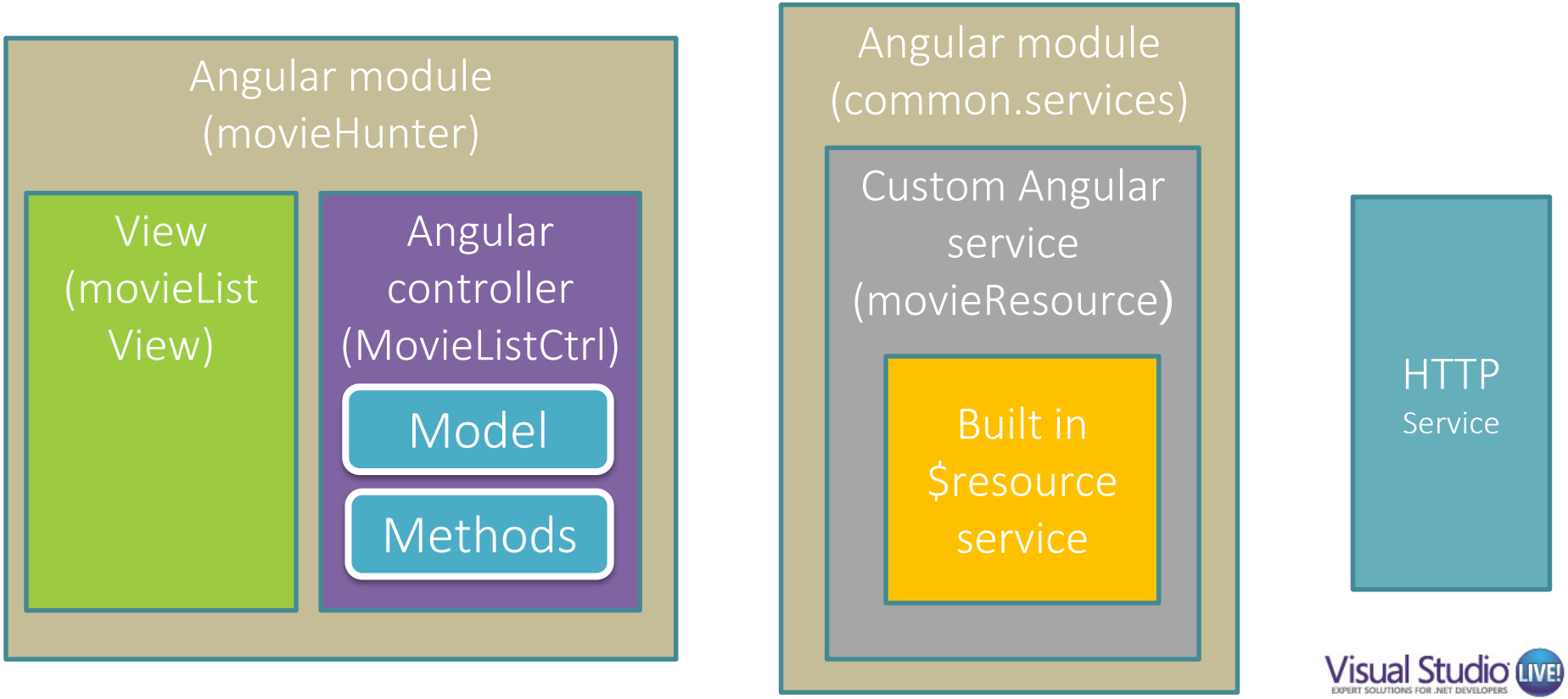
Reusable Data Access Service



DEMO:
RETRIEVING DATA

Take Away

Expressive HTML

Powerful Data Binding

Modularity

Rule-based Navigation

Easily Call HTTP Service

Thank You!

- @deborahkurata
- deborahk@insteptech.com
- http://blogs.msmvps.com/deborahk
- https://github.com/DeborahK/VSLive2015-SF