Angular Fundamentals

Jerry Kurata

Consultant | Developer | Mentor

Slides at https://github.com/JerryKurata/CodeStarsAngular

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Jerry Kurata

- Independent Consultant | Developer | Mentor
  - Web (Angular), .NET
  - Internet of Things (IoT)
  - Big Data
- Speaker
- PluralSight Author

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

Basics

Navigation and Routing

Data Access

Forms and Validation

BASICS

Overview - Basics

Introduction to Angular

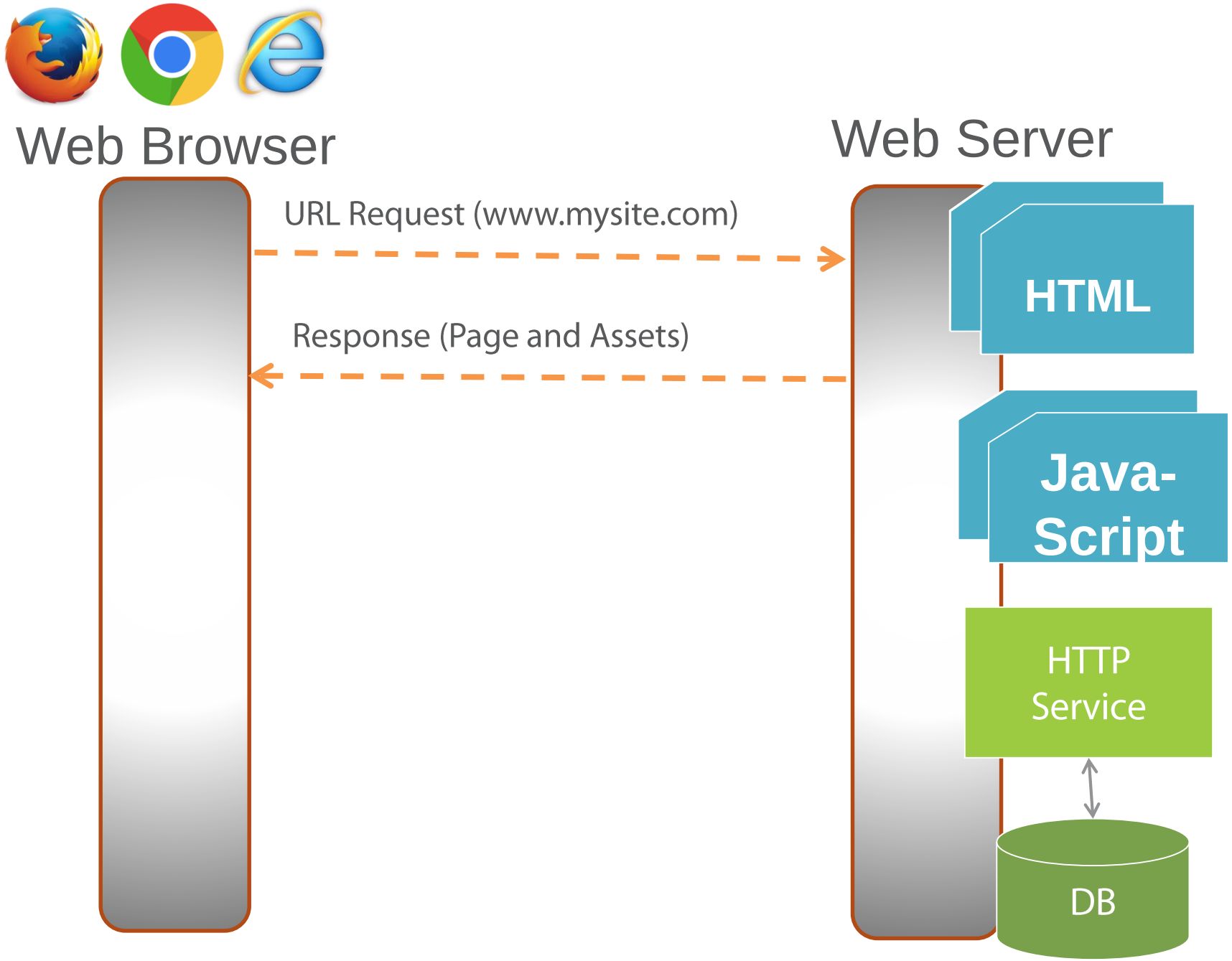
Angular and HTML: Building a View

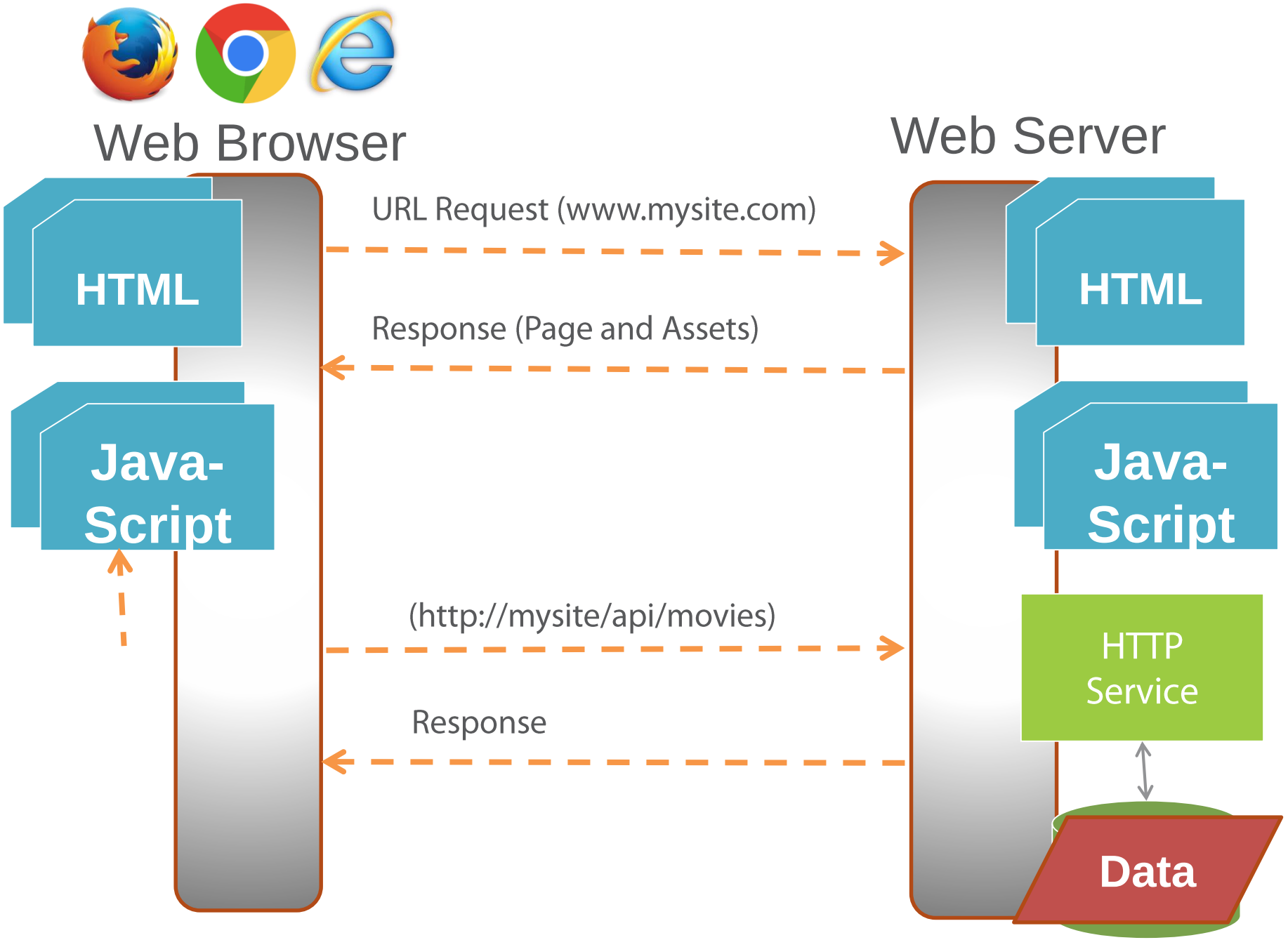
HTML Data Binding

Angular Code: Building the Module & Controller

Bootstrap: Styling the View

- 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/
- Current version 1.4/1.5. Version 2.0 in 6+ months


Web Browser
Web Server
URL Request (www.mysite.com)
Response (Page and Assets)
HTML
Java-
Script
HTTP
Service
DB


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

DOM

- Document Object Model
- Tree structure that defines all of the loaded elements in an HTML document

DEMO:
TAKE 6 COMPLETED

Why Angular?

- Expressive HTML
- Powerful Data Binding
- Modularity
- Rule-based Navigation
- Easily Call HTTP Service
- Authoritative Forms
- Testable
- It's Popular

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>
```

Directives

Expressive HTML

- Extend HTML
  - Apply special behavior to attributes or elements in the HTML
  - Are simple to define in the HTML
    - Google directives 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>
```

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>
```

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}">
```

Directives and Binding

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

Expressive HTML

Powerful Data Binding

Angular Code

Modularity

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

Module

Defines an Angular component

Tracks the component code

Tracks the dependencies for the component

Keeps the application modularized

Angular Module Method

Setter Method

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

Getter Method

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

Angular Main Module

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

Angular Main Module

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

Angular Main Module - IIFE

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

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

Modularity

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

Controller

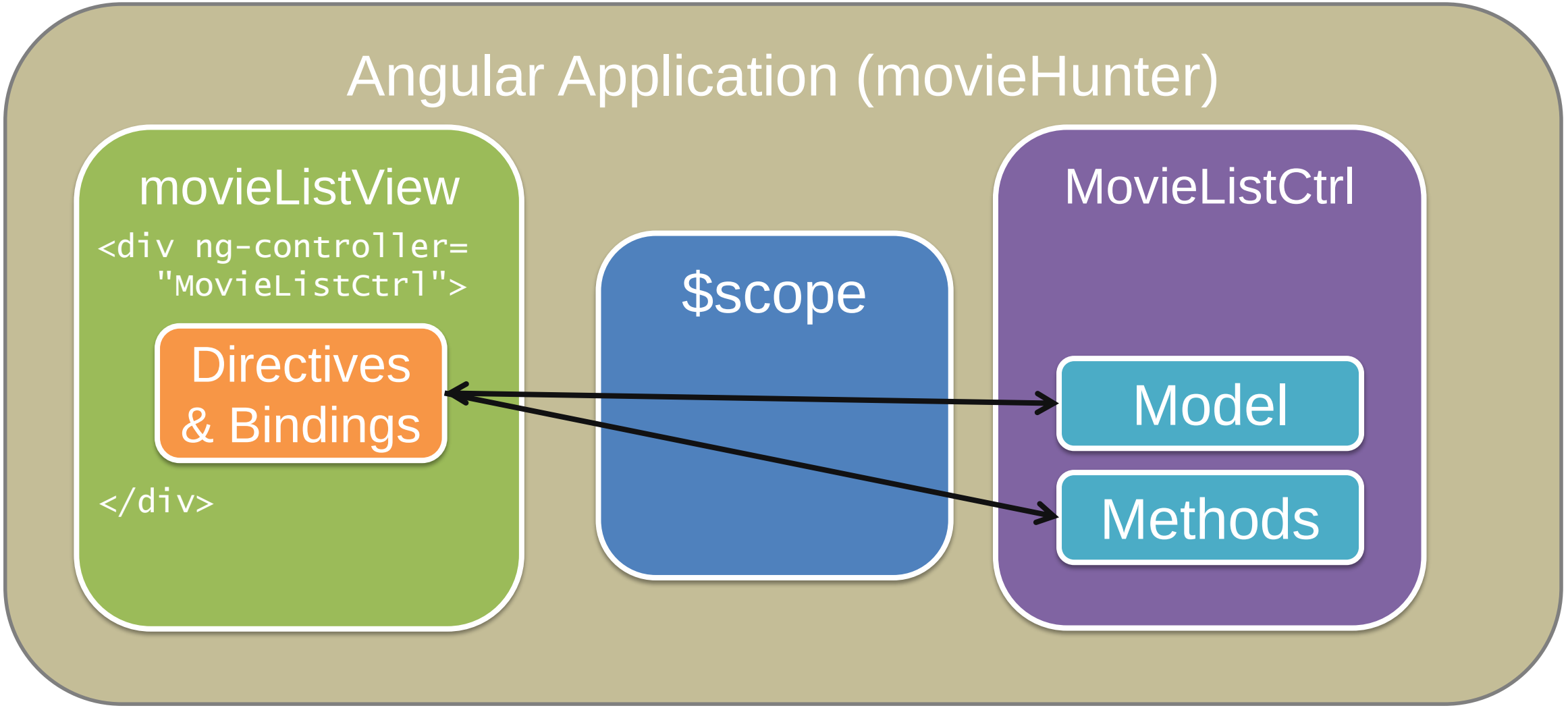
Defines the Model

- Movies

Implements Methods

- Hide/Show Images

View, Controller, and $scope



Angular Controller

```
(function () {
    "use strict";

    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;
        };

}());
```

Angular "Controller As" Syntax

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

    function MovieListCtrl() {
        var vm = this;
        $scope.movies = [];
        $scope.title = "Search by Movie Title";
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View "Controller As" Syntax

```
<div ng-controller="MovieListCtrl">
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 <div ng-show="listFilter">
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            <td>{{ movie.releaseDate | date }}</td>
            <td>{{ movie.mpaa | uppercase}}</td>
    </tr>
   </tbody>
 </table>
</div>
```

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>
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View "Controller As" Syntax

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 <table ng-if="vm.movies.length">
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        <tr>
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 </table>
</div>
```
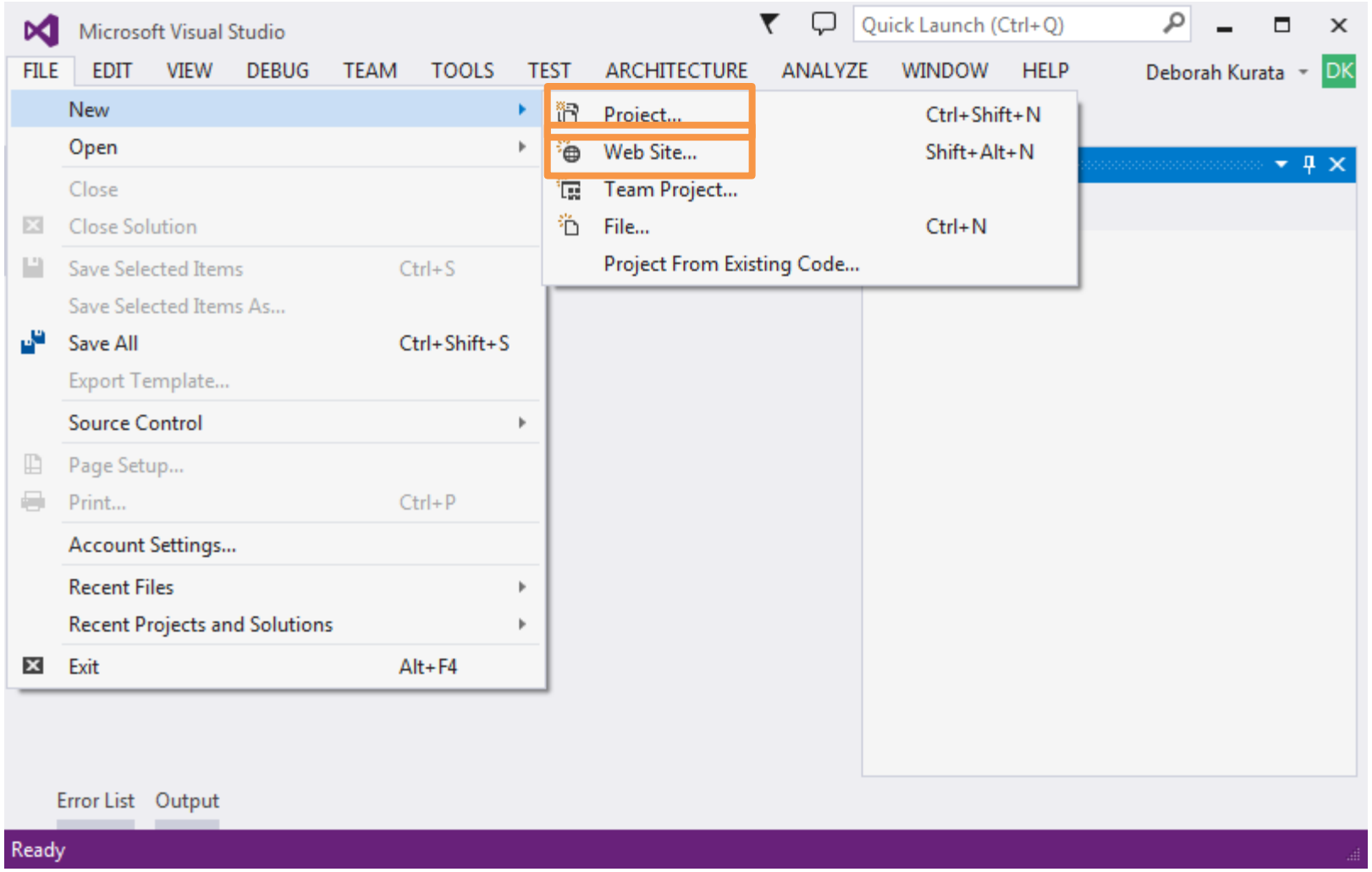
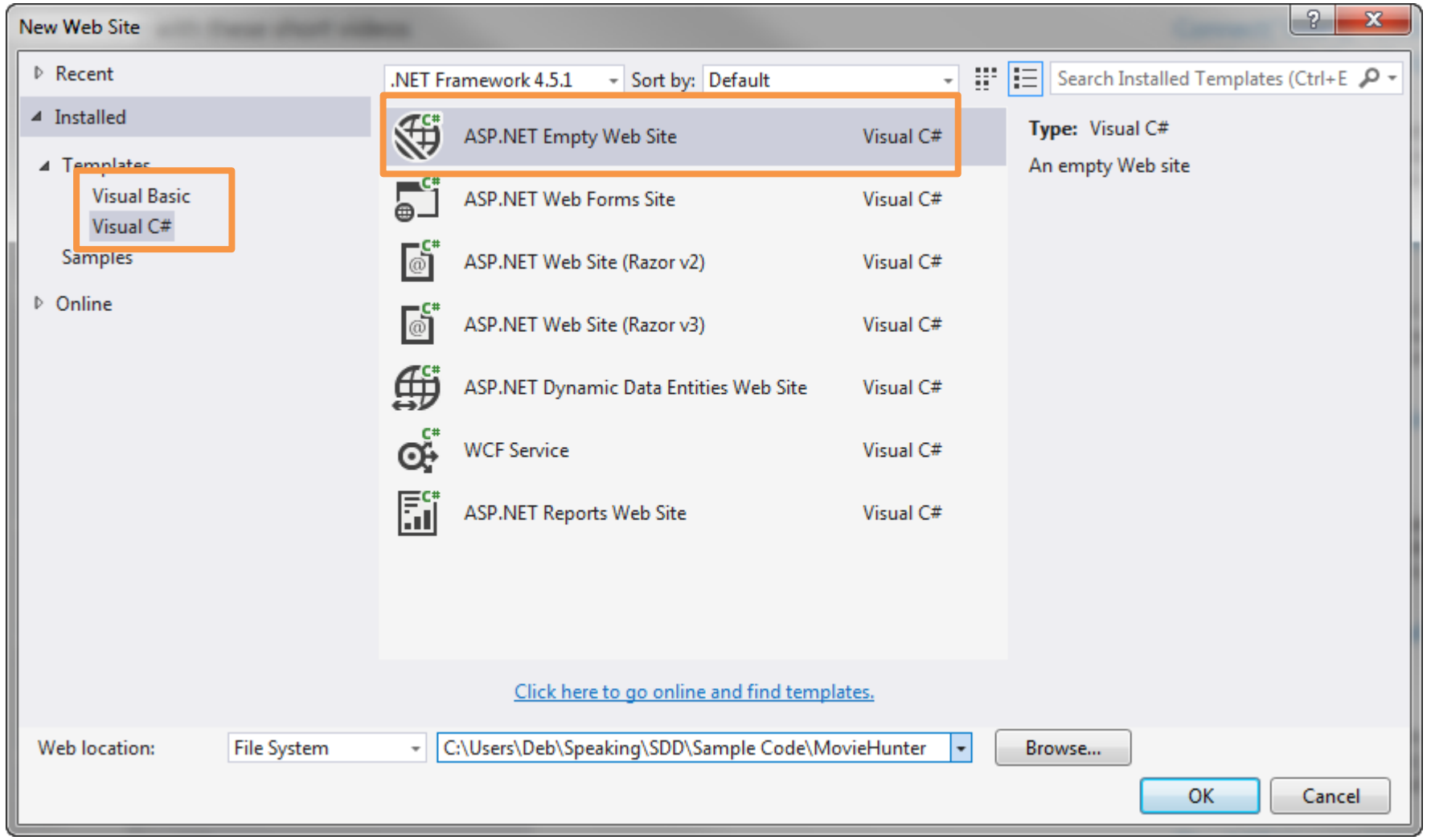

Creating an Angular Project



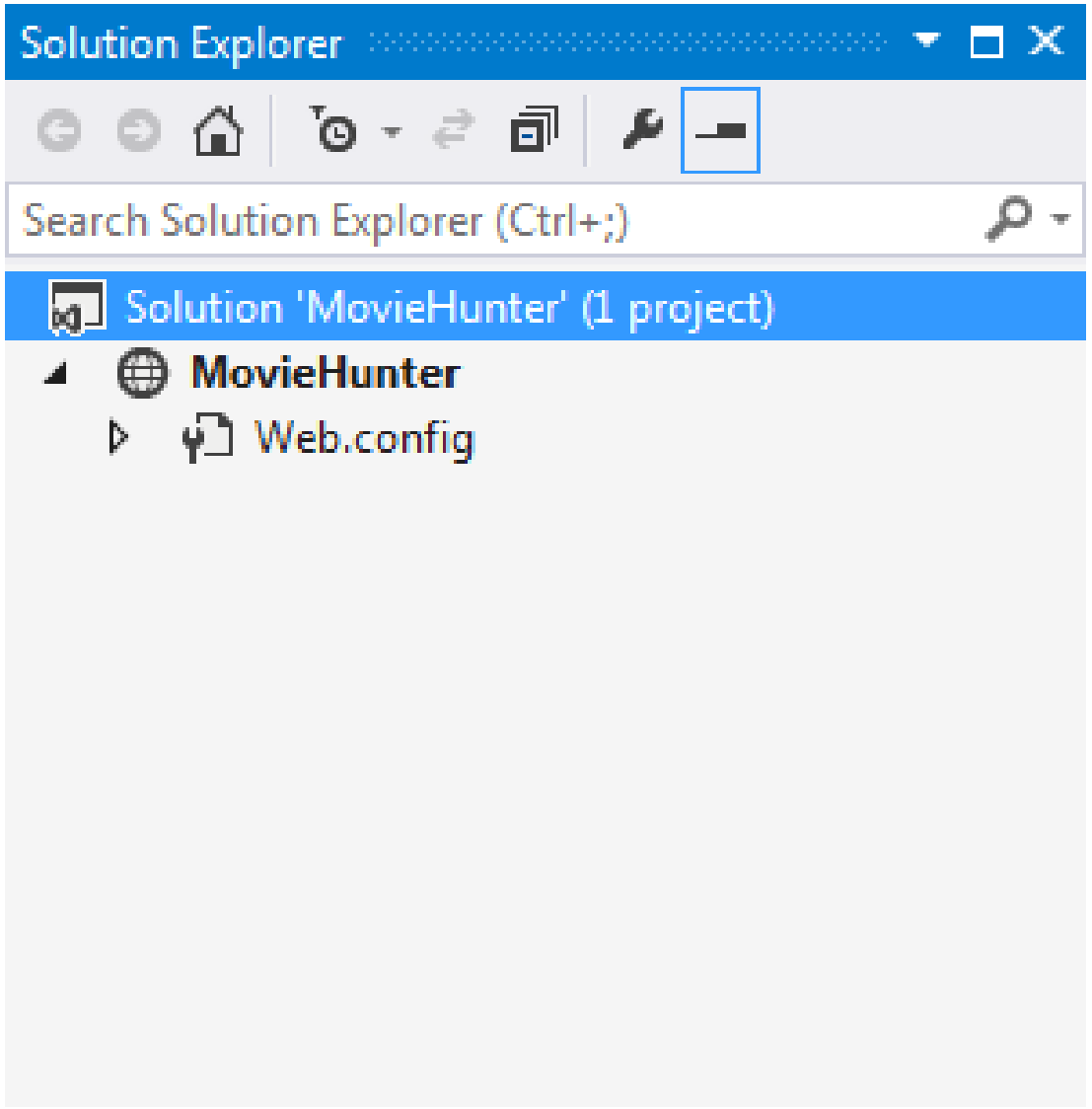
Project Structure

- Creating a project
- Require projects files
- Organizing files

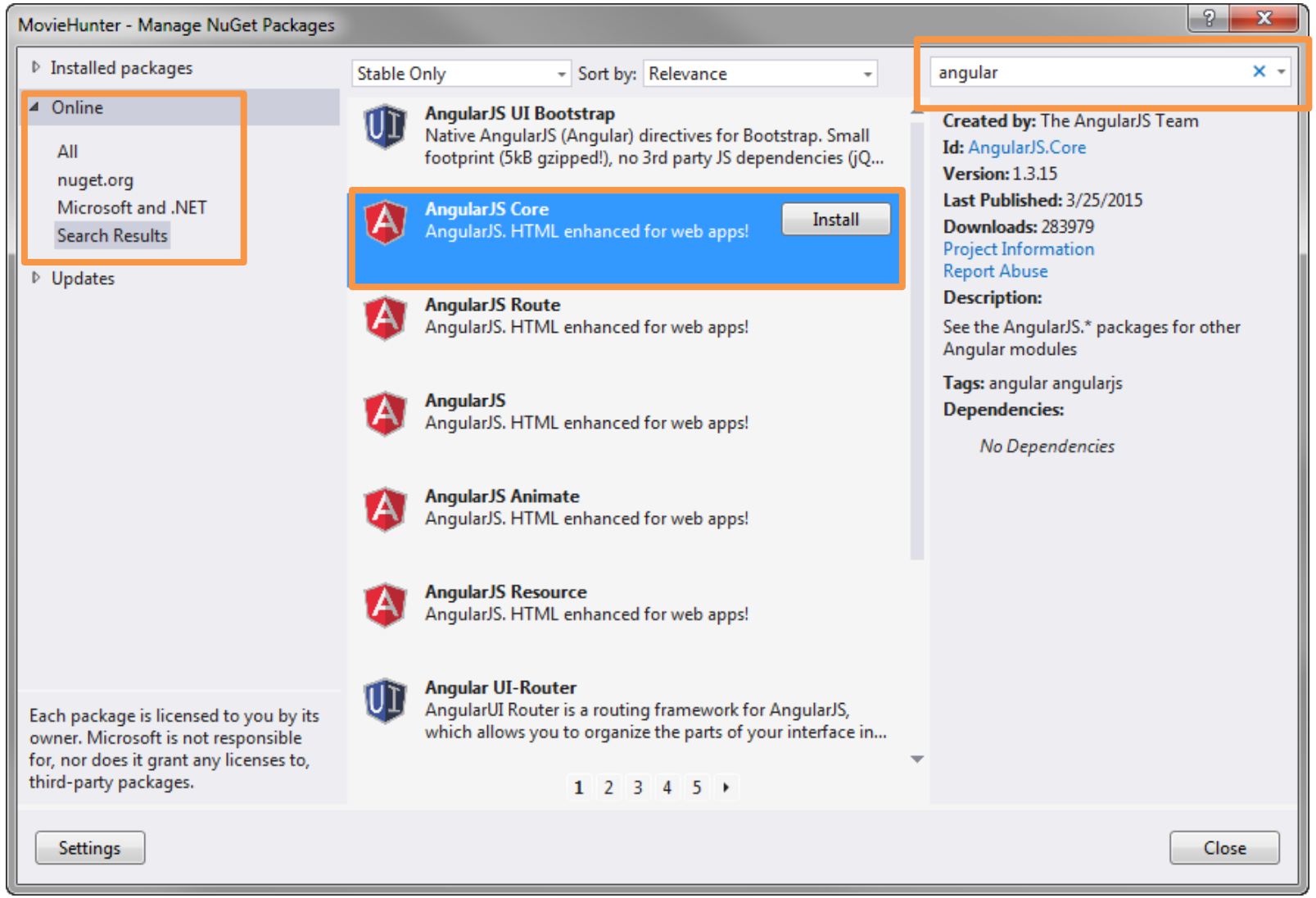
Selecting a Template



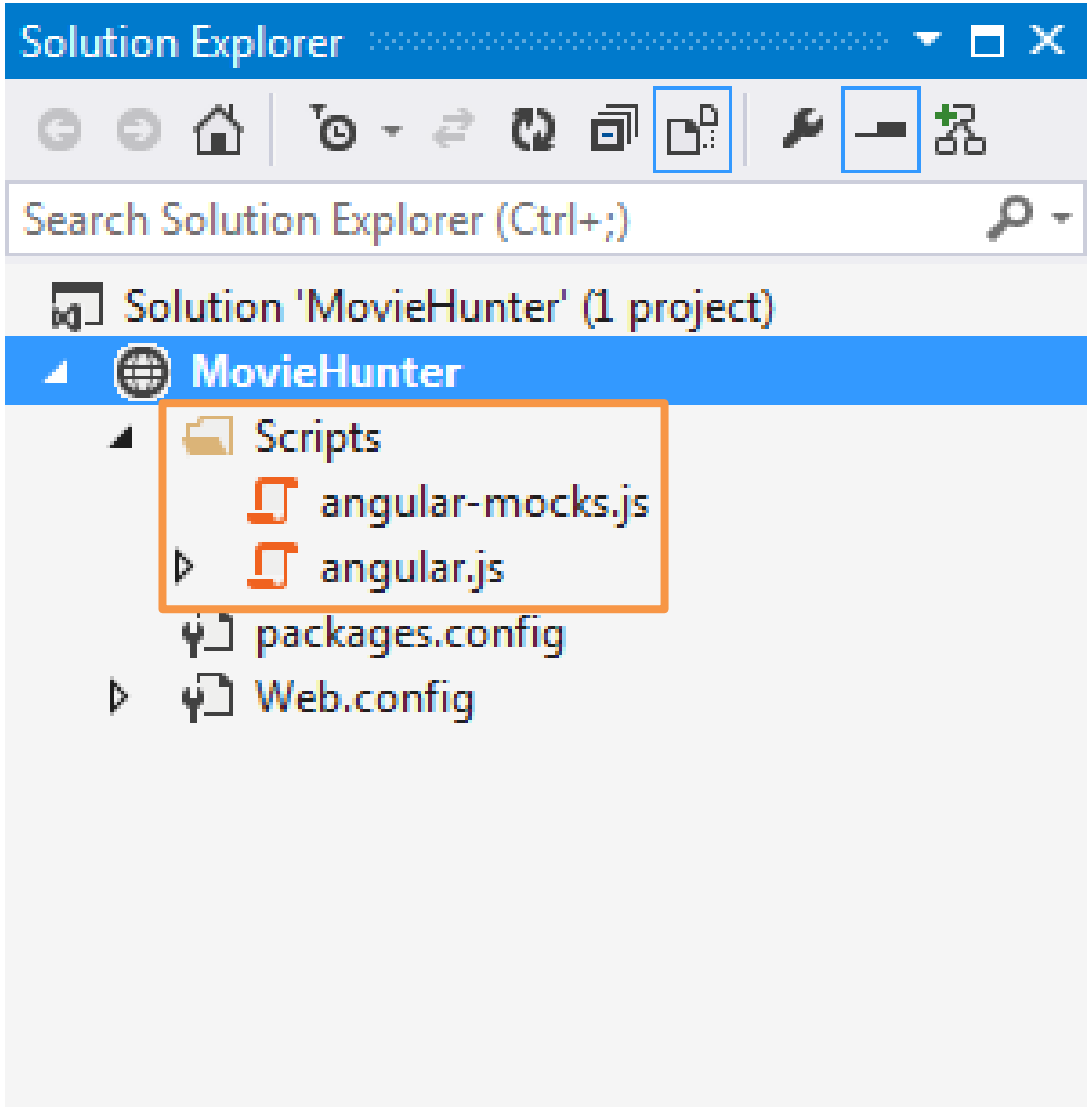
Generated Solution

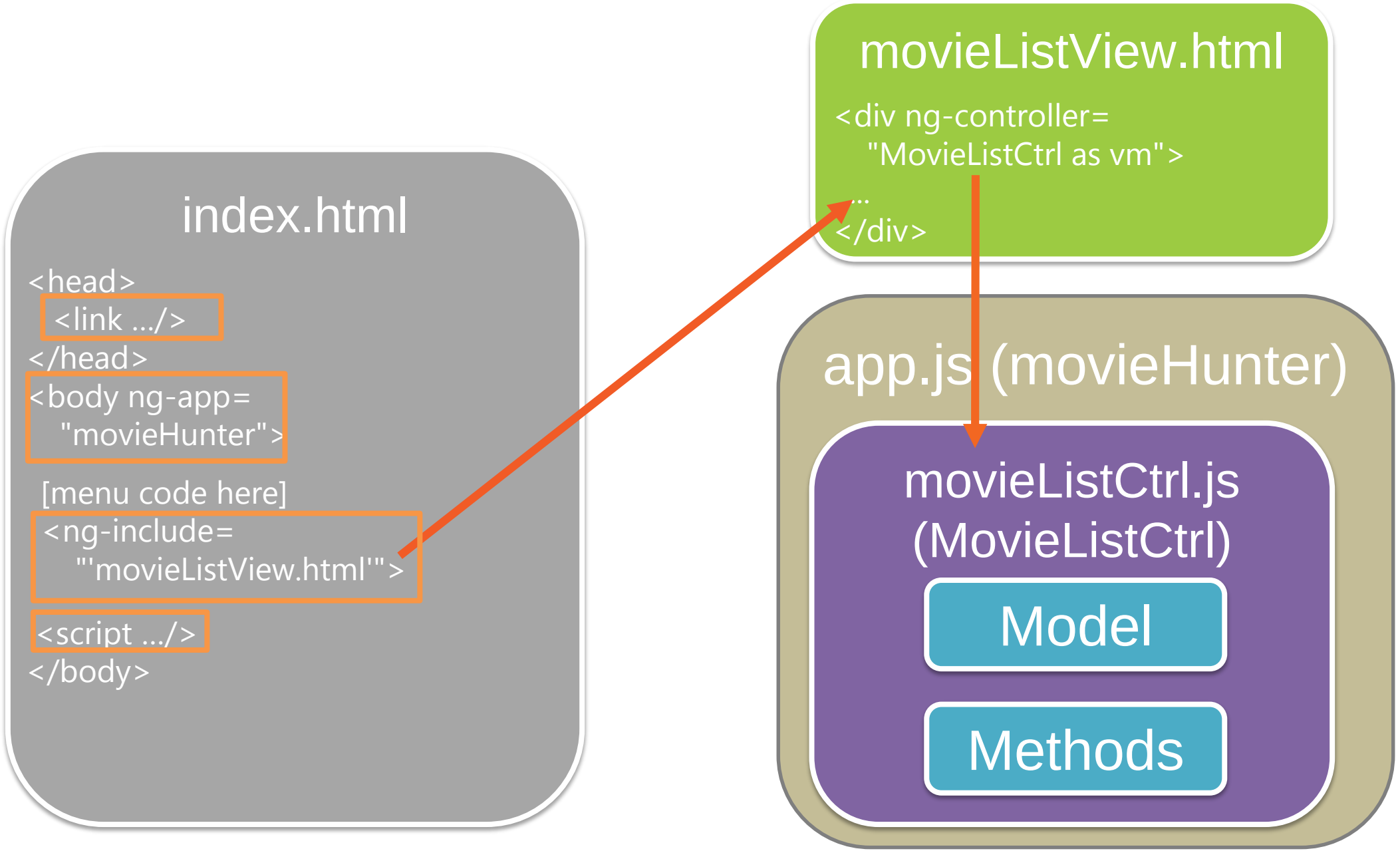


NuGet Package Manager



Solution Explorer




movieListView.html
<div ng-controller=
"MovieListCtrl as vm">
...

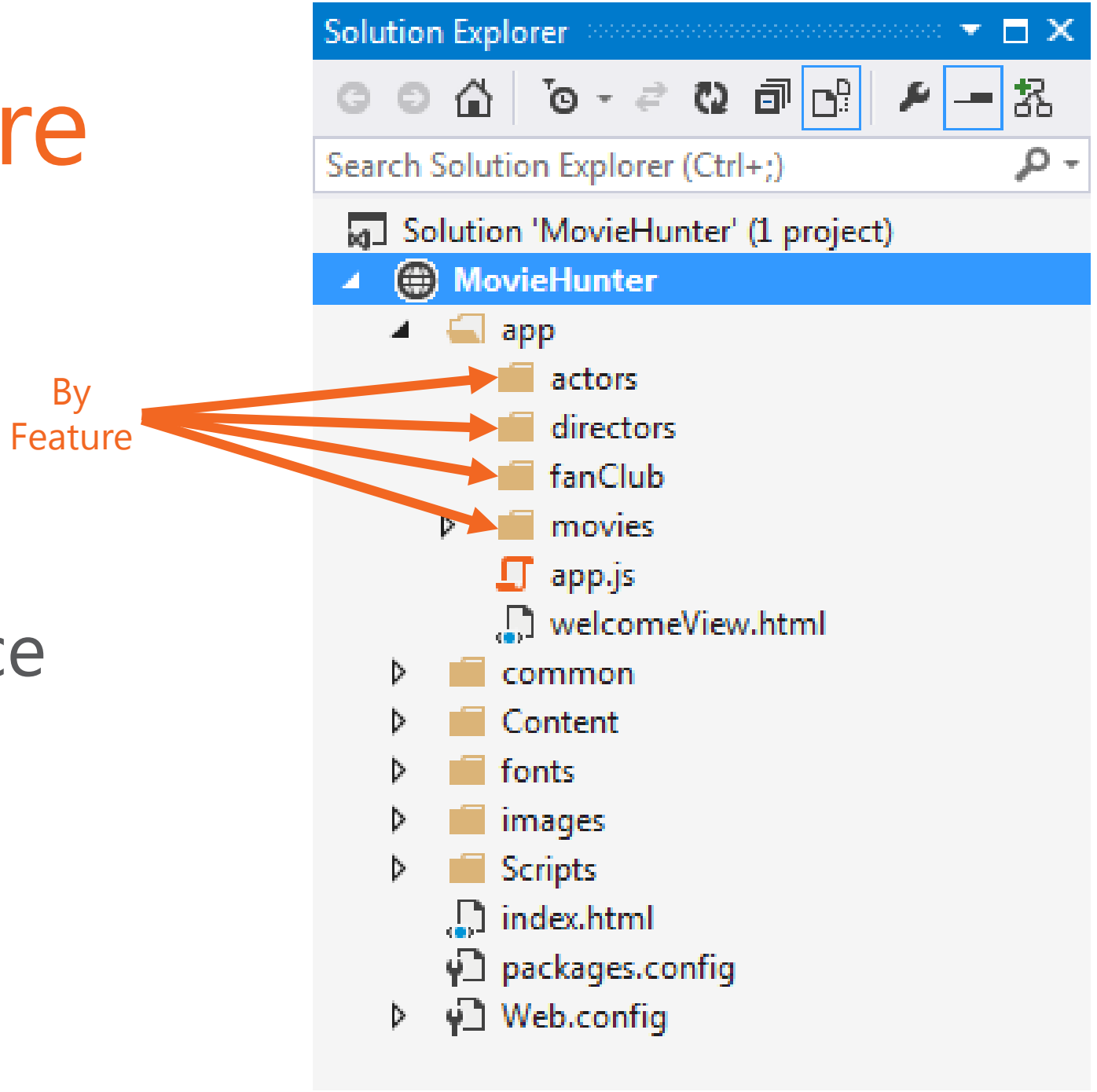
index.html
<head>
<link .../>
</head>
<body ng-app=
"movieHunter">
[menu code here]
<ng-include=
"'movieListView.html'">
<script .../>
</body>
app.js (movieHunter)
movieListCtrl.js
(MovieListCtrl)
Model
Methods

Project Structure

Provides order

Supports multiple developers

Simplifies Maintenance



Angular Style Guide

https://github.com/johnpapa/angular-styleguide

DEMO: LAB 1

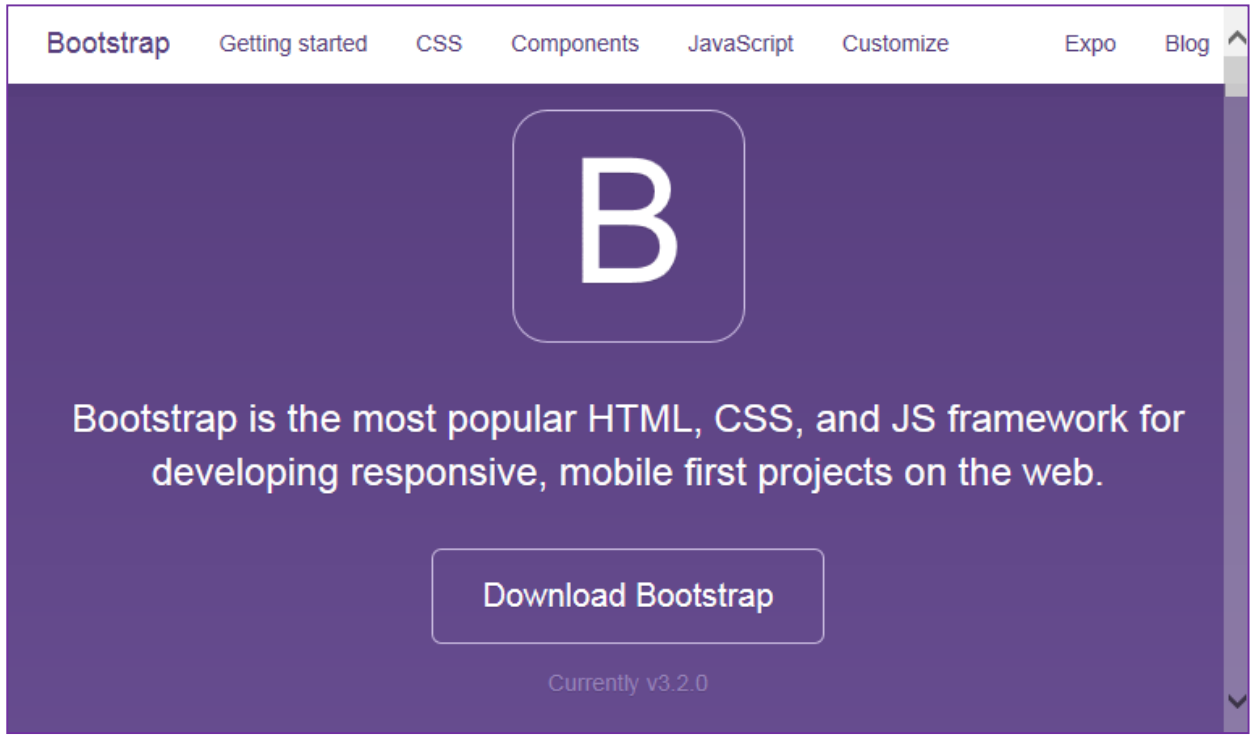
Session Materials & Sample Code

https://github.com/DeborahK/angularu2015

Bootstrap

http://getbootstrap.com

- Framework for prettifying Web pages
- Developed by Twitter
- Large third party community
- CSS Class based



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					

Bootstrap Style Classes

```
<div class="panel panel-primary">
    <div class="panel-heading">
        <h2 class="title">{{vm.title}}</h2>
    </div>

    <div class="panel-body">

        <!-- Filter the Title   -->
        <div class="row">
            <div class="col-md-2">Filter by:</div>
            <div class="col-md-4">
              <input type="text" ng-model="listFilter" />
            </div>
        </div>
. . .
```

DEMO: LAB 2

Review - Basics

Introduction to Angular

Angular and HTML: Building a View

Data Binding

Angular Code: Building the Module & Controller

Bootstrap: Styling the View

Routing

Rate Yourself on Routing

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

Overview - Routing

Introduction to SPA

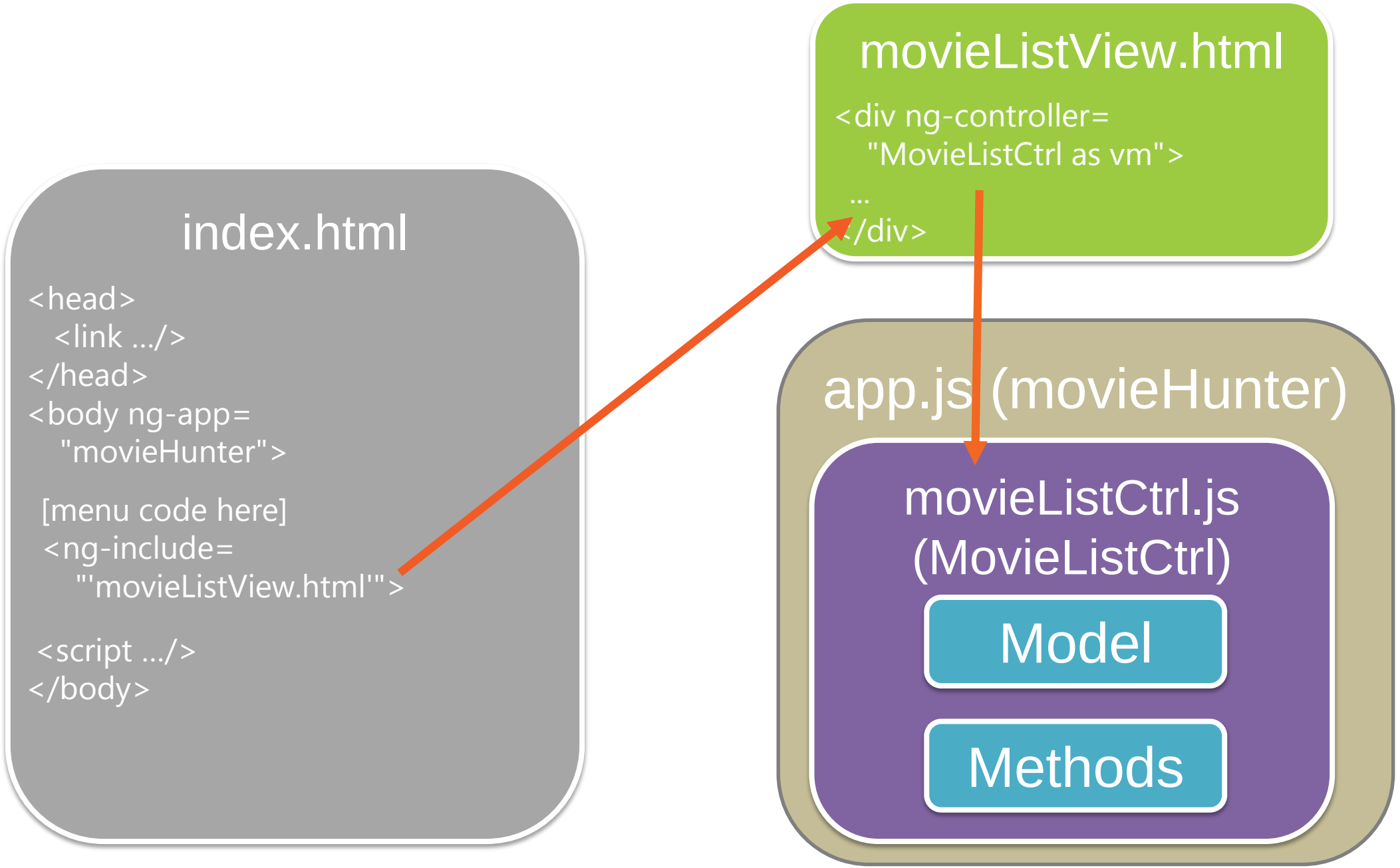
Rule-Based Navigation / Routing

Routing Frameworks

Defining Routes (ngRoute)

Navigating Routes (ngRoute)

DEMO:
ANGULAR IN ACTION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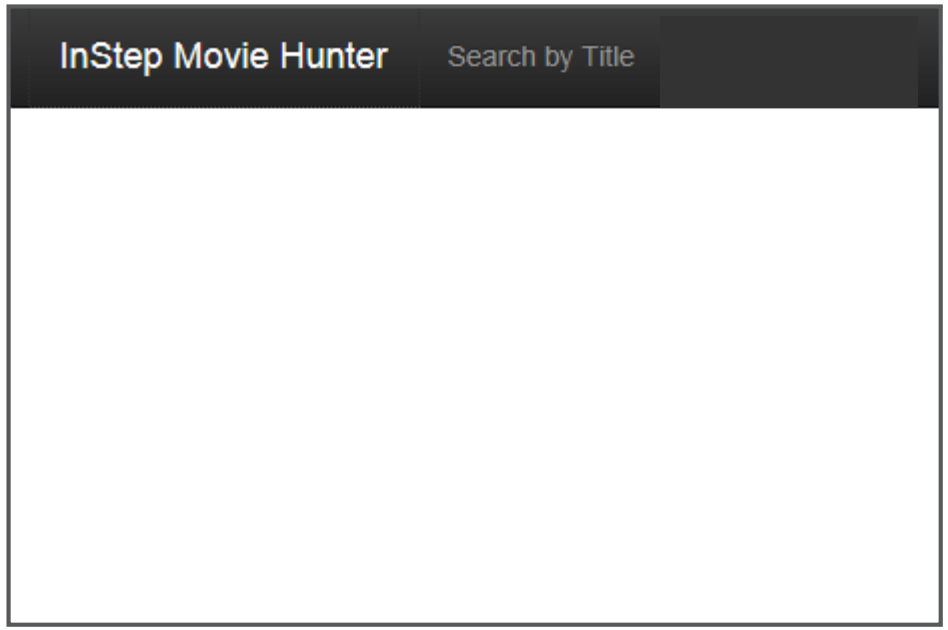
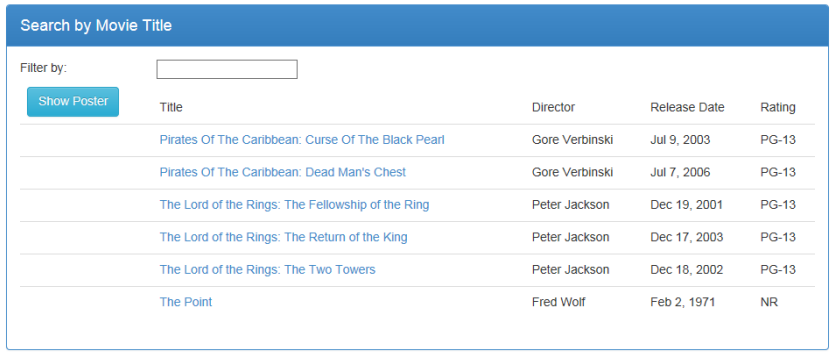
[menu code here]
<ng-include=
"'movieListView.html'">
<script .../>
</body>
app.js (movieHunter)
movieListCtrl.js
(MovieListCtrl)
Model
Methods

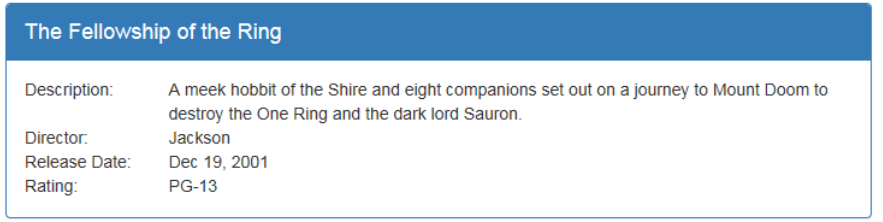
SPA

- Single Page Application
- Only one page?
  - Only one full HTML page
  - All other pages are HTML fragments called templates
  - And are displayed within the one HTML page
- Goals:
  - Enhance user experience
  - Reduce round tripping

Multiple Views







Routing

Rule-based Navigation

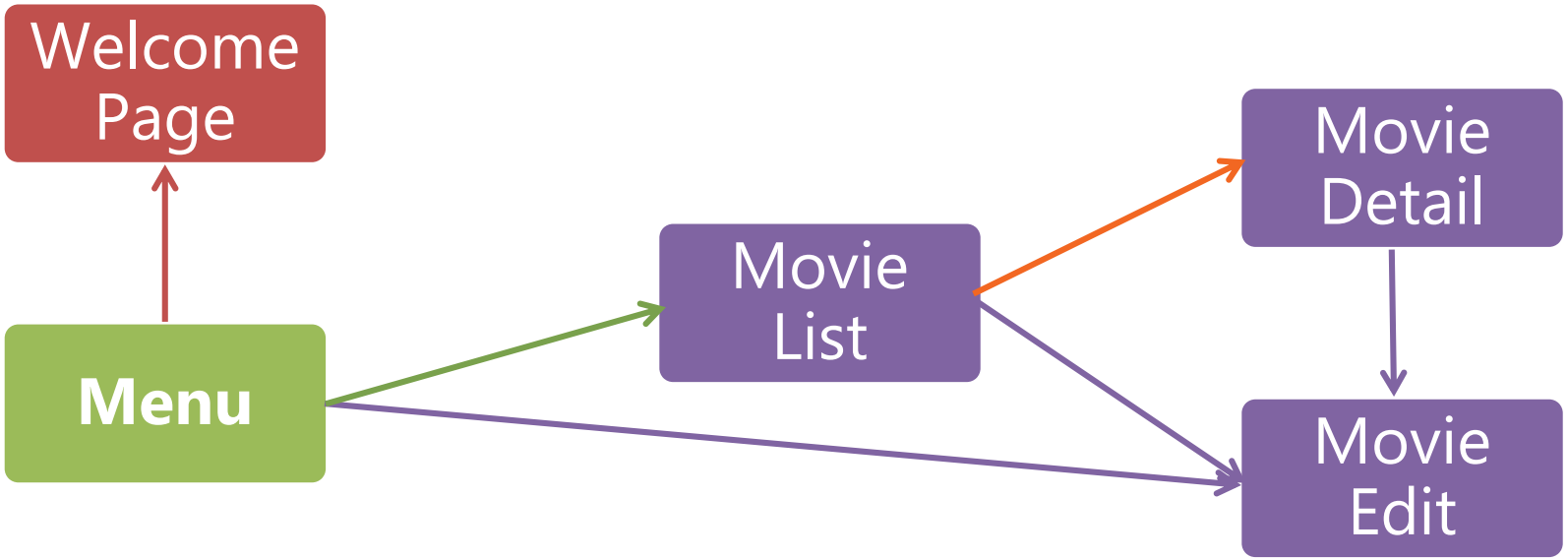
Technique for navigating between views

Routes defined by rules

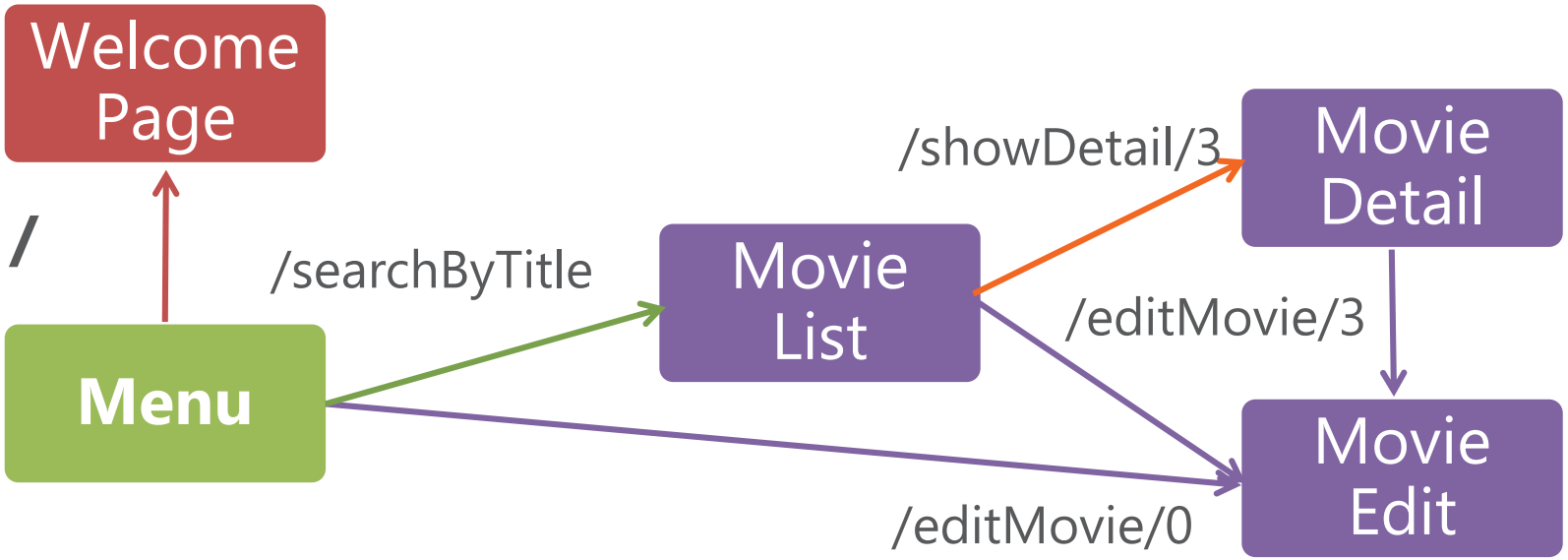
Each route represents a specific view

Activating a route navigates to that view

Site Map

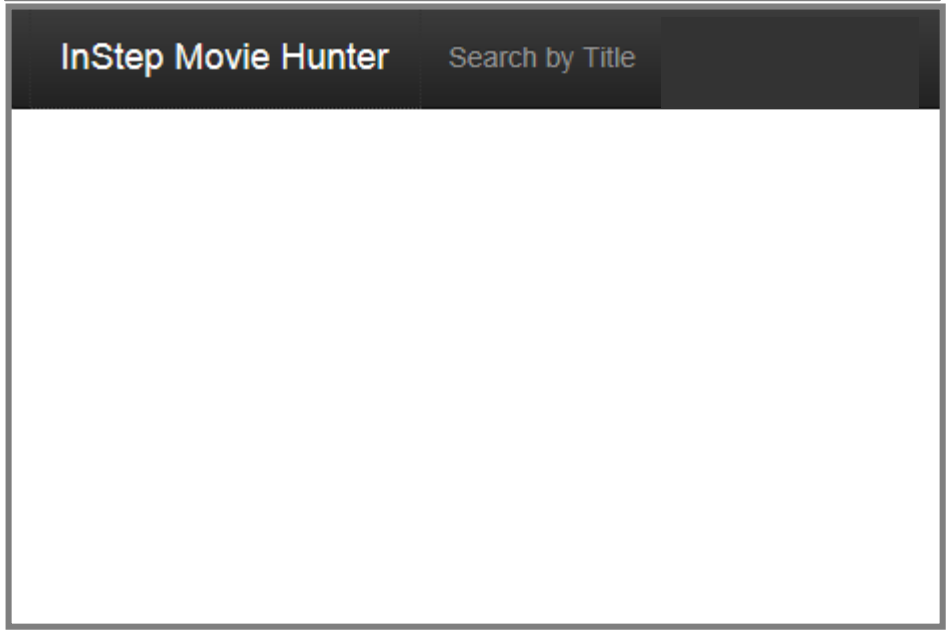


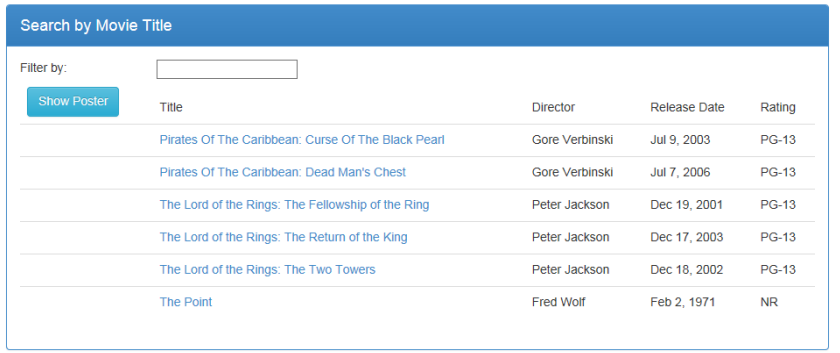
Routes

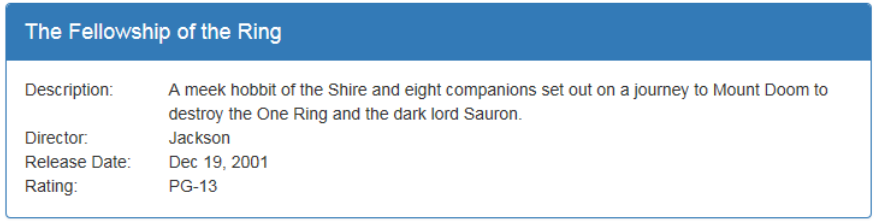

Welcome Page
/
Menu
/searchByTitle
Movie List
/showDetail/3
Movie Detail
/editMovie/3
Movie Edit
/editMovie/0

Routing URL Fragments

<mysite>/index.html#/showDetail/3







Routing Frameworks

ngRoute

Setting Up Routing: ngRoute

Define where each view should appear

Set up the routing rules:

- Path, associated view, associated controller

Navigate by activating a route

ngRoute: index.html

Define where each view should appear

```
…

<div class="container">
    <div ng-include src='…'></div>
</div>

…
```

ngRoute: index.html

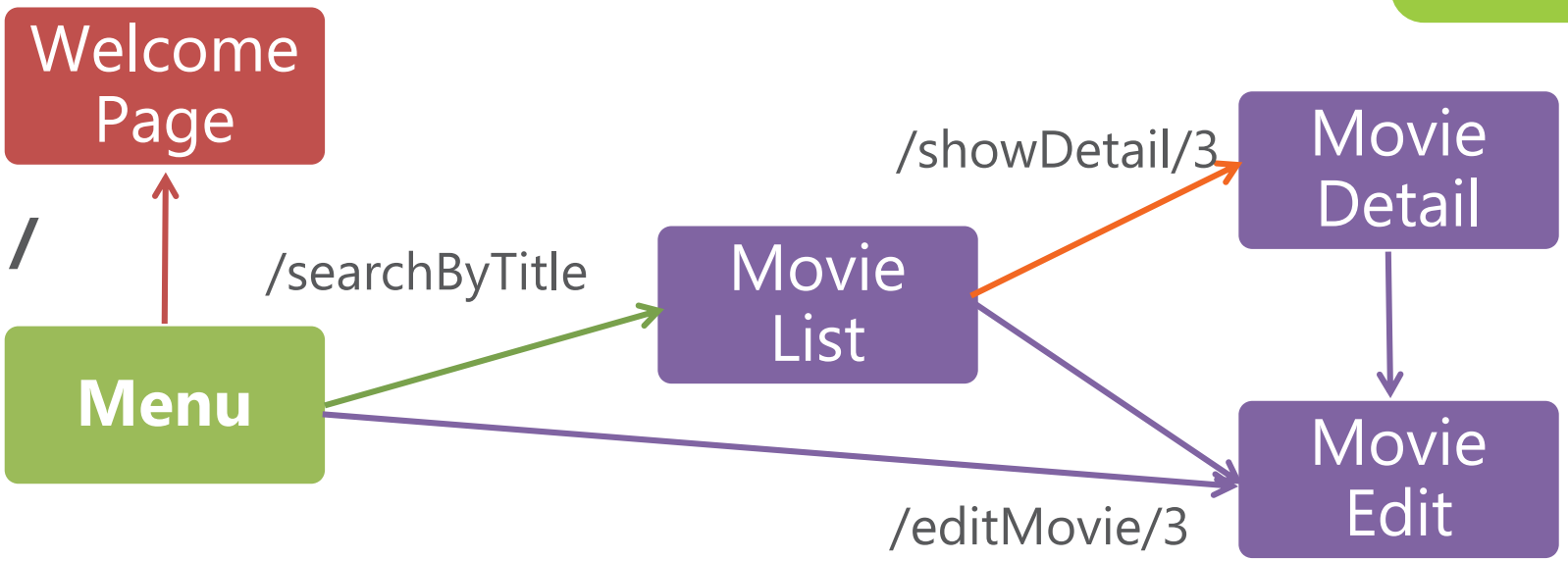
Define where each view should appear

```
…

<div class="container">
    <div ng-view></div>
</div>

…
```

Routes

Set up the routing rules:

- Path, associated view, associated controller



ngRoute: app.js

Set up the routing rules:

- Path, associated view, associated controller

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

app.config(['$routeProvider',
    function ($routeProvider) {
        $routeProvider
            .when("/", {
                templateUrl: "app/welcomeView.html"
            })
            .when("/searchByTitle", {
                templateUrl: "app/movies/movieListView.html",
                controller: "MovieListCtrl as vm"
            })
            .when("/showDetail/:movieId", {
                templateUrl: "app/movies/movieDetailView.html",
                controller: "MovieDetailCtrl as vm"
            })
            .otherwise("/");
    }]);
```

Navigating Routes

Navigate by activating a route

- Anchor tags
  - Link to the appropriate route

```
<a ng-href="#searchByTitle">
```

- $location service

```
$location.path("/searchByTitle");
```

ngRoute: index.html

Navigate by activating a route

```
<div class="navbar-collapse collapse">
  <ul class="nav navbar-nav">
    <li>
      <a ng-href="#searchByTitle">Search by Title</a>
    </li>
  </ul>
</div>
```

ngRoute: movieDetailView.html

```
<div class="panel-footer">
    <a class="btn btn-default"
       ng-href="#searchByTitle"
       style="width:80px">
       <i class="glyphicon glyphicon-chevron-left"></i>
       Back
    </a>
</div>
```

DEMO: LAB 3

Review - Routing

Introduction to SPA

Rule-Based Navigation / Routing

Routing Frameworks

Defining Routes (ngRoute)

Navigating Routes (ngRoute)

Data Access

Rate Yourself on Data Access

- 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

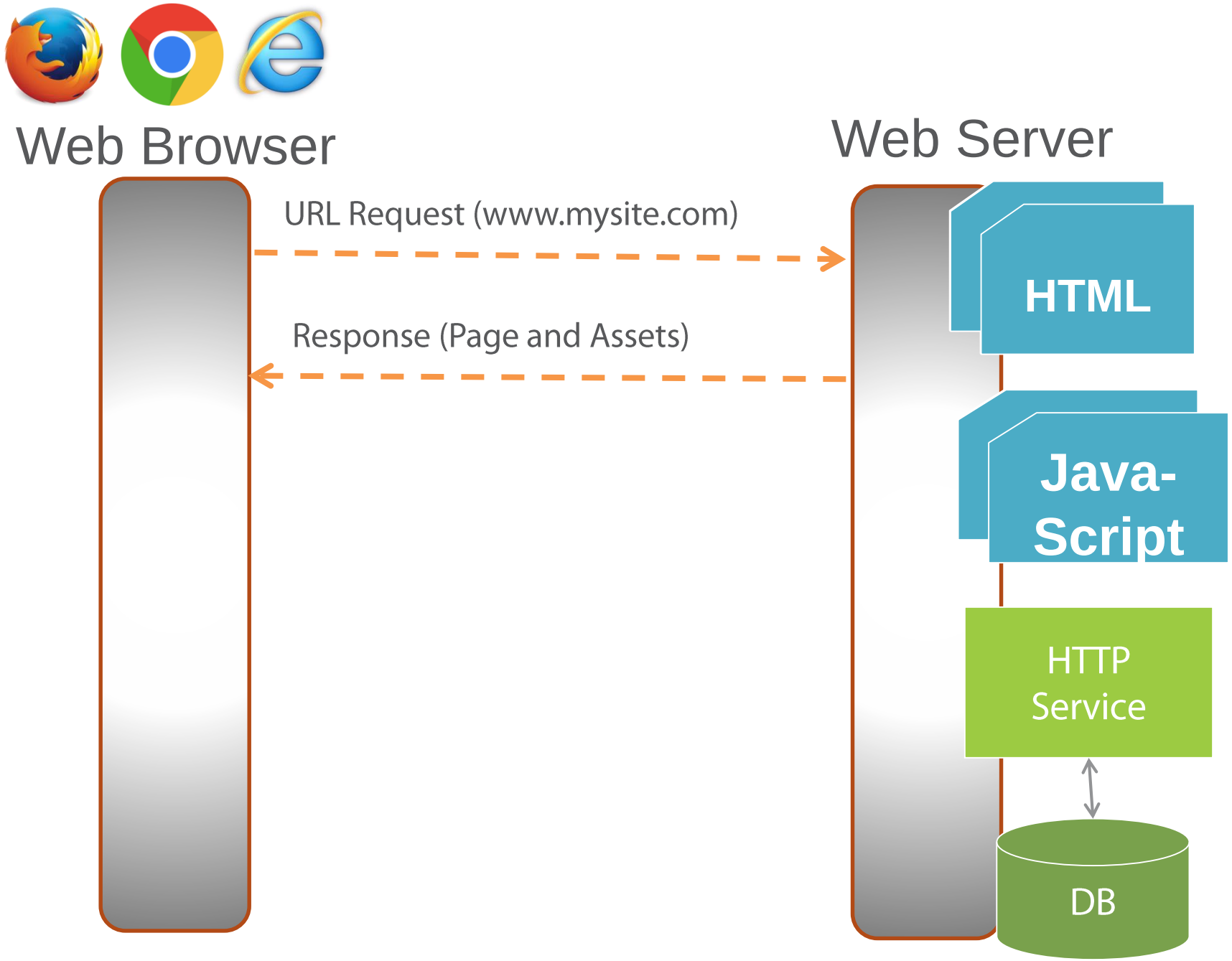
Overview – Data Access

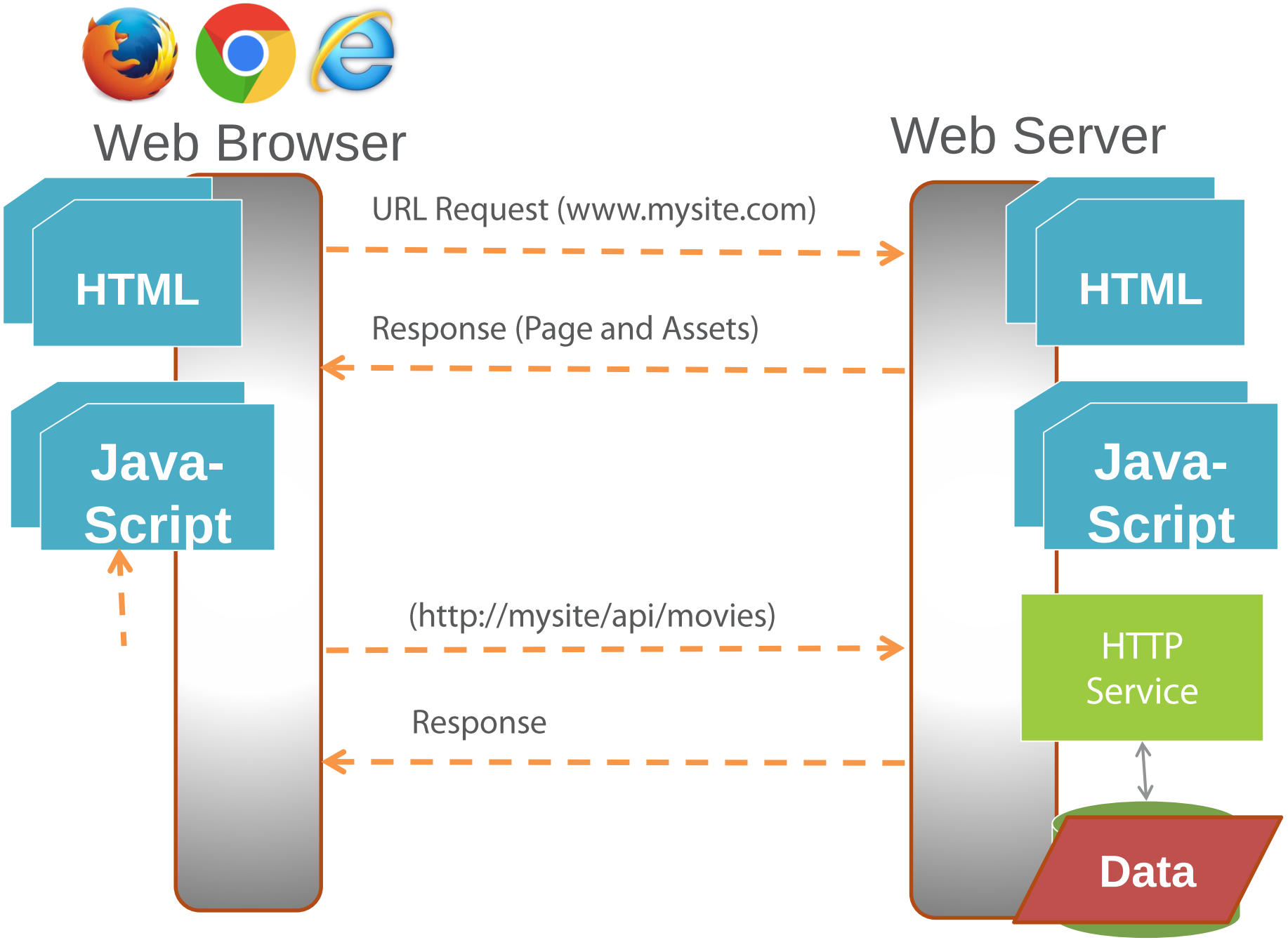
Request/Response Flow

JavaScript Promises

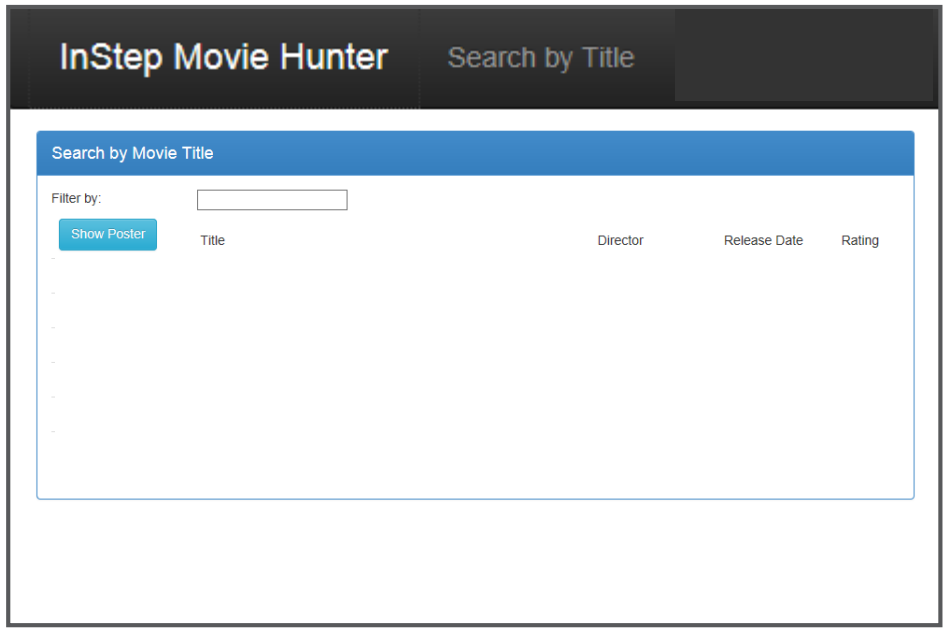
Retrieving Data via HTTP Service

Reusable Code: Building a Service


Web Browser
Web Server
URL Request (www.mysite.com)
Response (Page and Assets)
HTML
Java-
Script
HTTP
Service
DB


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

Retrieving Data

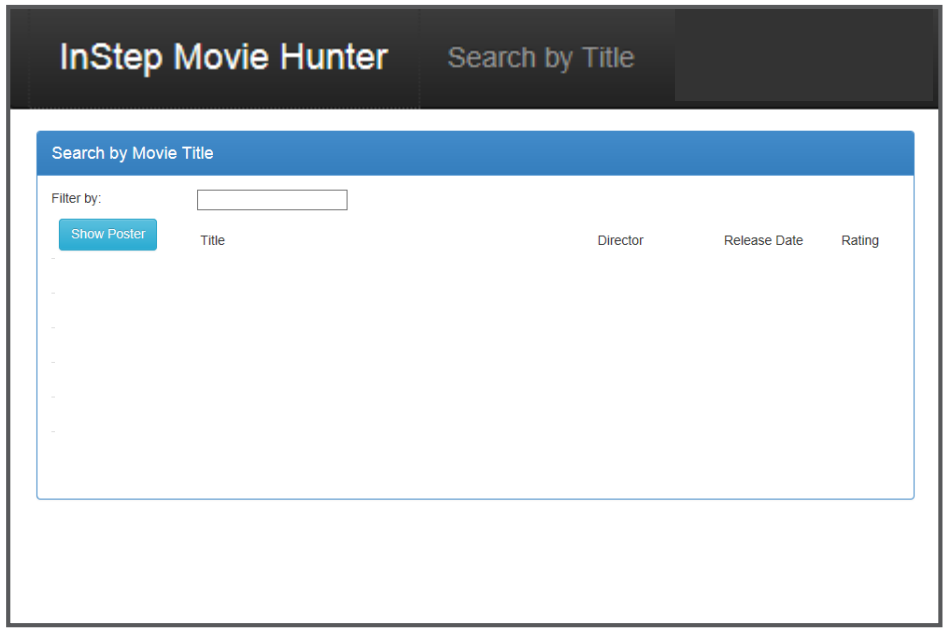


GET Request

`api/movies`

HTTP Service

Retrieving Data



GET Request

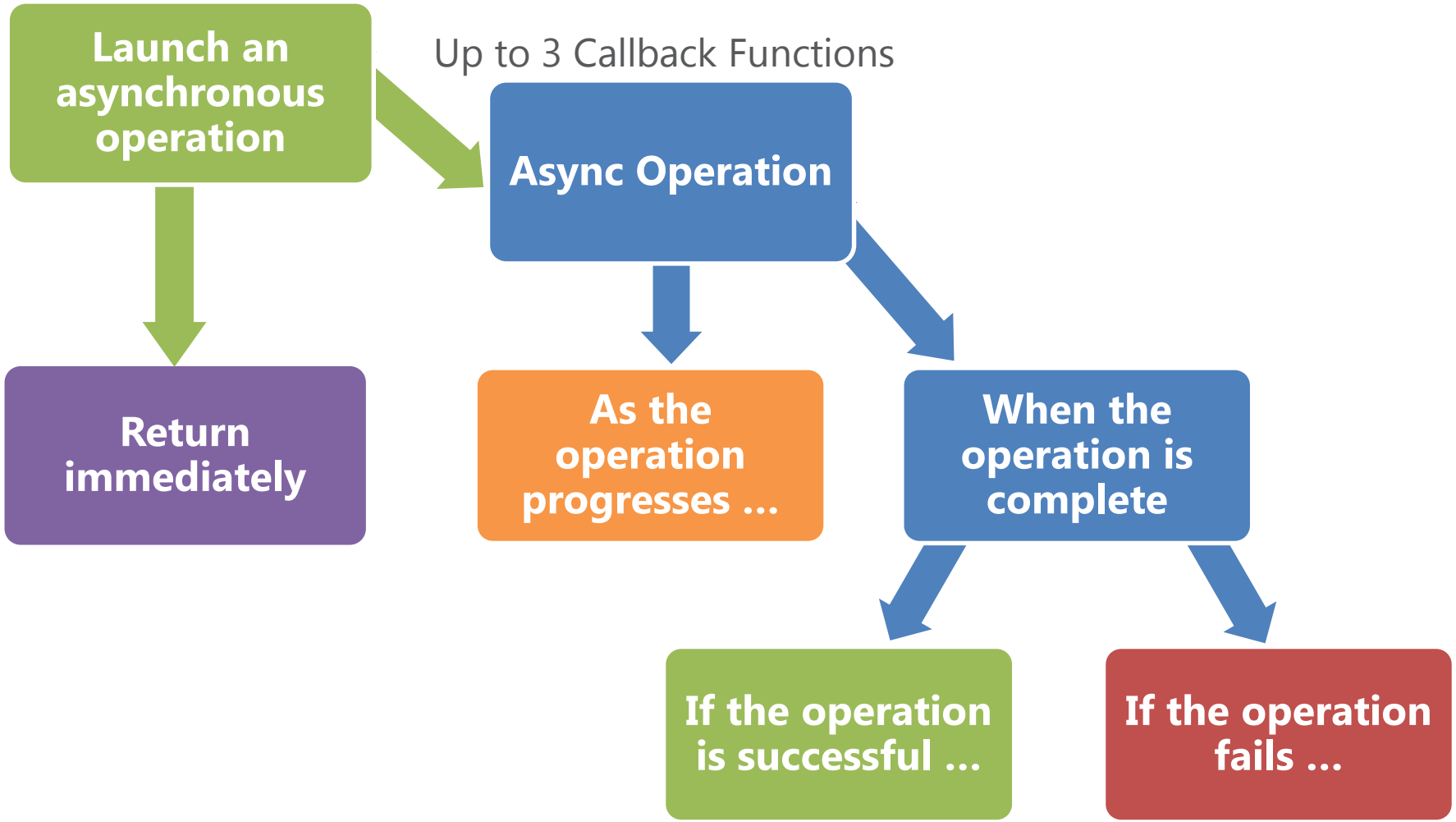
api/movies

Response

HTTP Service

```
[
 {  director: "Peter Jackson",
    movieId: 1,
    mpaa: "pg-13",
    releaseDate: "2001-12-19T00:00:00",
    title: "The Lord of the Rings: The Fellowship of the Ring"
  },
  { director: "Peter Jackson",
    movieId: 2,
    mpaa: "pg-13",
    releaseDate: "2002-12-18T00:00:00",
    title: "The Lord of the Rings: The Two Towers"
   },
   ...
]
```

JavaScript Promise



Calling HTTP Service

$http

$resource

$httpBackend

```
$http.get("/api/movies/")
     .success(function(response) {
          vm.movies = response.data;
      });
```

$http

Built into Angular Core

Facilitates communication with a back-end service
    get, post, put, delete, …

Asynchronous

REST

- REpresentational State Transfer
- Requests and responses involve the transfer of resources
- Resources are identified with a URL
  - /api/movies/
- Requests utilize a standard set of HTTP verbs
  - GET | POST | PUT | DELETE
- And much more!

```
function movieResource($resource) {
  return $resource("/api/movies/:movieId")
        }
```

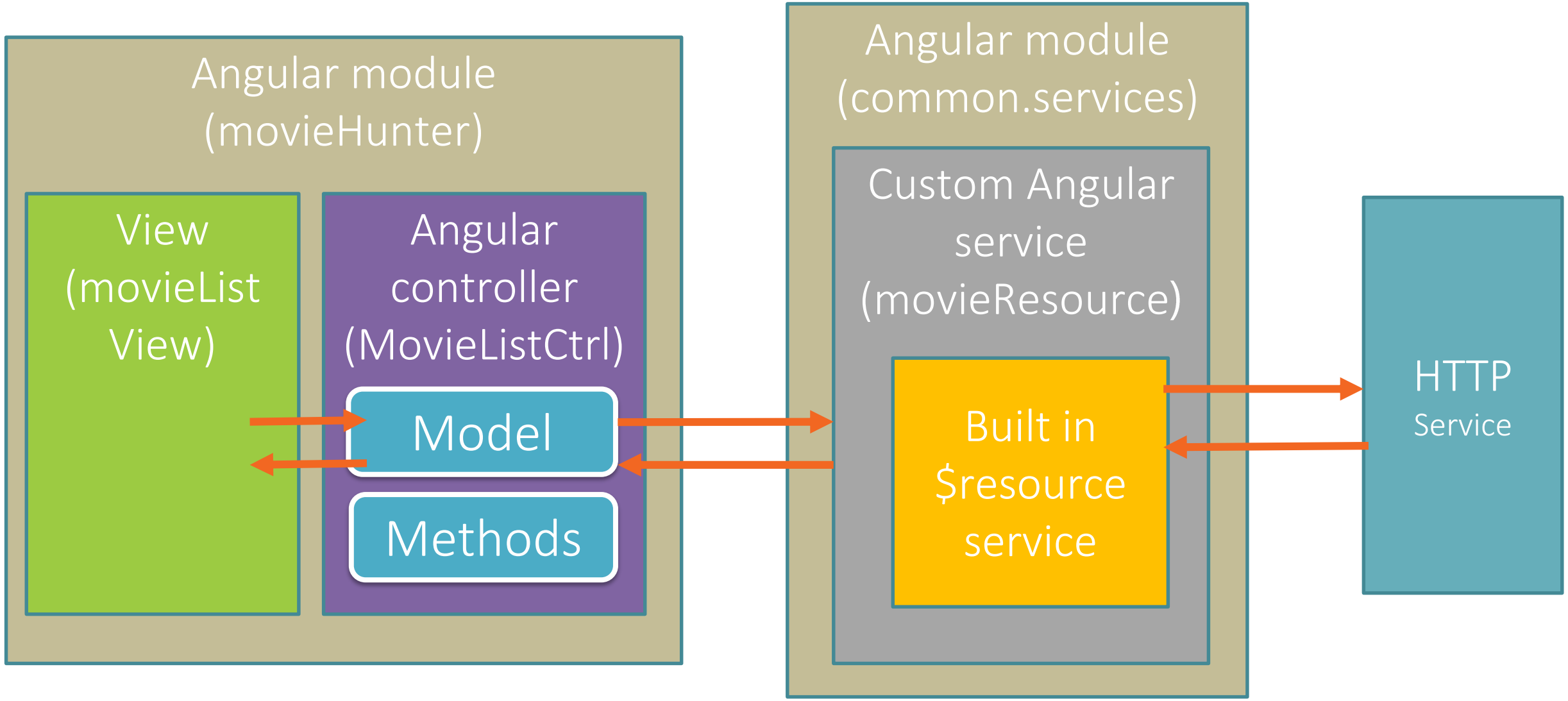
$resource

Separate Angular component: angular-resource
ngResource

Abstraction on top of $http for calling RESTful services

Requires less code

Reusable Data Access Service



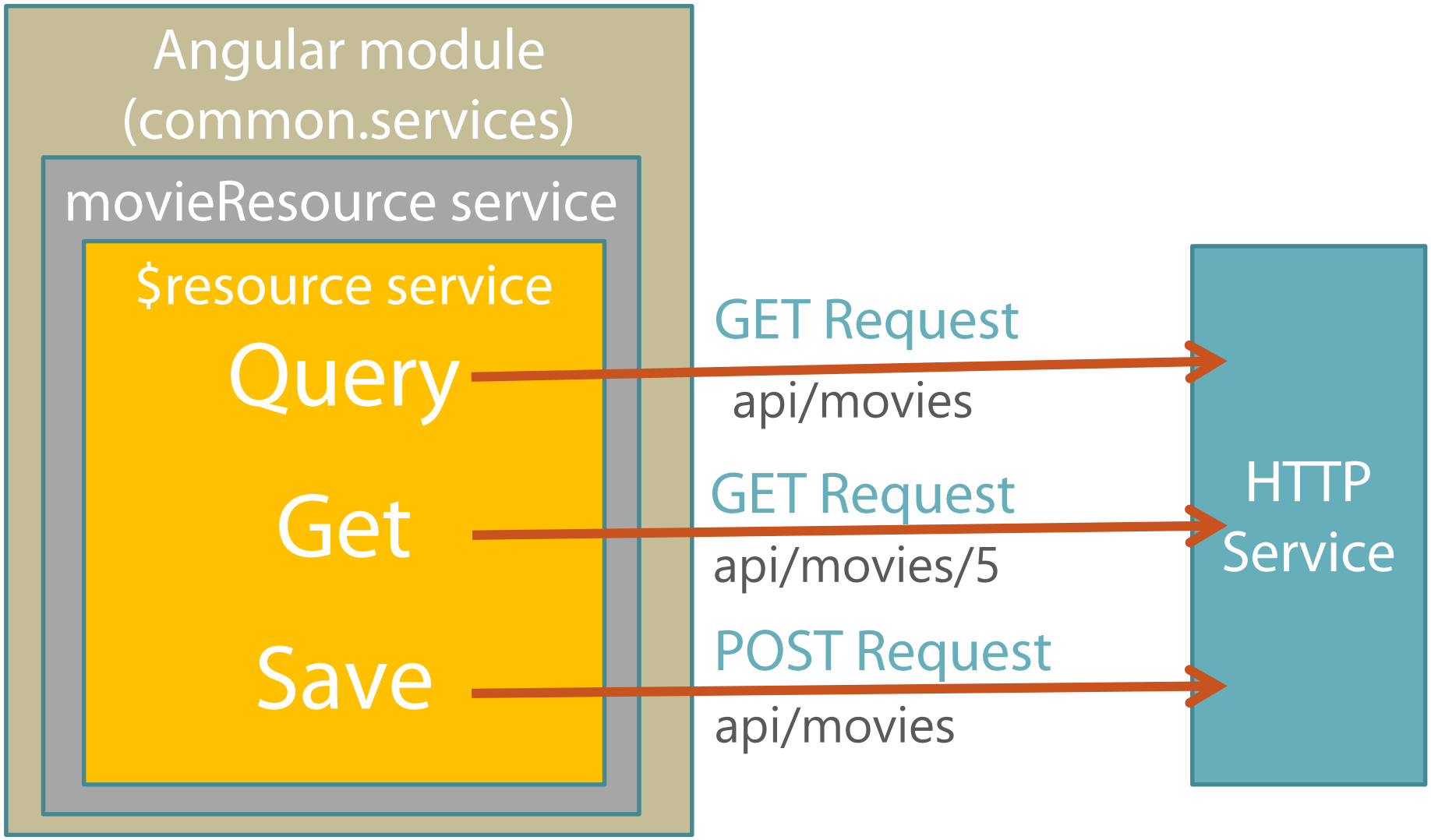
Module: common.services

```
(function () {
    "use strict";

    angular
        .module("common.services",
                ["ngResource"])
        .constant("appSettings",
        {
            serverPath : "http://localhost:1561"
        });
}());
```

Service: movieResource

```
(function () {
    "use strict";

    angular
        .module("common.services")
        .factory("movieResource",
                 ["$resource",
                  "appSettings",
                     movieResource]);

    function movieResource($resource, appSettings) {
        return $resource(appSettings.serverPath +
                                 "/api/movies/:id");
    }
}());
```

Built-In $resource Methods



$resource Methods

Method Name	Verb	URL	Description
query	GET	/api/movies	Retrieves all of the movies
get	GET	/api/movies/5	Retrieves the specified movie
save	POST	/api/movies	Saves modifications to the movie

```
movieResource.query(function (data) {
    vm.movies = data;
});
```

```
movieResource.get({ movieId: $routeParams.movieId },
    function (data) {
        vm.movie = data;
});
```

$resource Methods (cont)

Method Name	Verb	URL	Description
query	GET	/api/movies	Retrieves all of the movies
get	GET	/api/movies/5	Retrieves the specified movie
save	POST	/api/movies	Saves modifications to the movie

```
vm.movie.$save(function (data) {
   vm.message = "Save successful.";
});
```

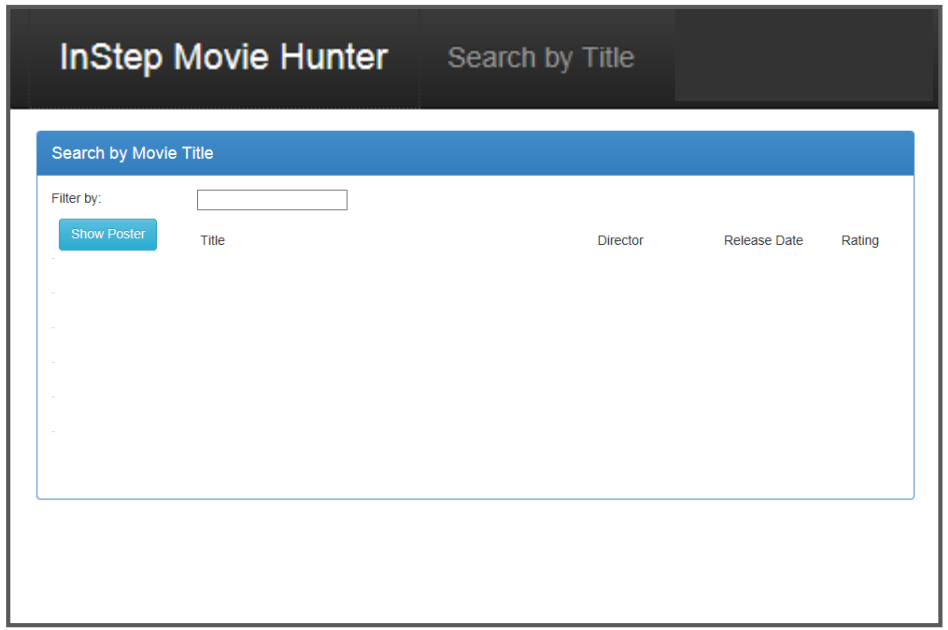
Using movieResource

```
(function () {
    "use strict";

    angular
    .module("movieHunter")
    .controller("MovieListCtrl",
                ["movieResource",
                    MovieListCtrl]);

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

Using movieResource (cont)

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

    movieResource.query(
        function (data) {
            vm.movies = data;
        });
}

}());
```

Data Access

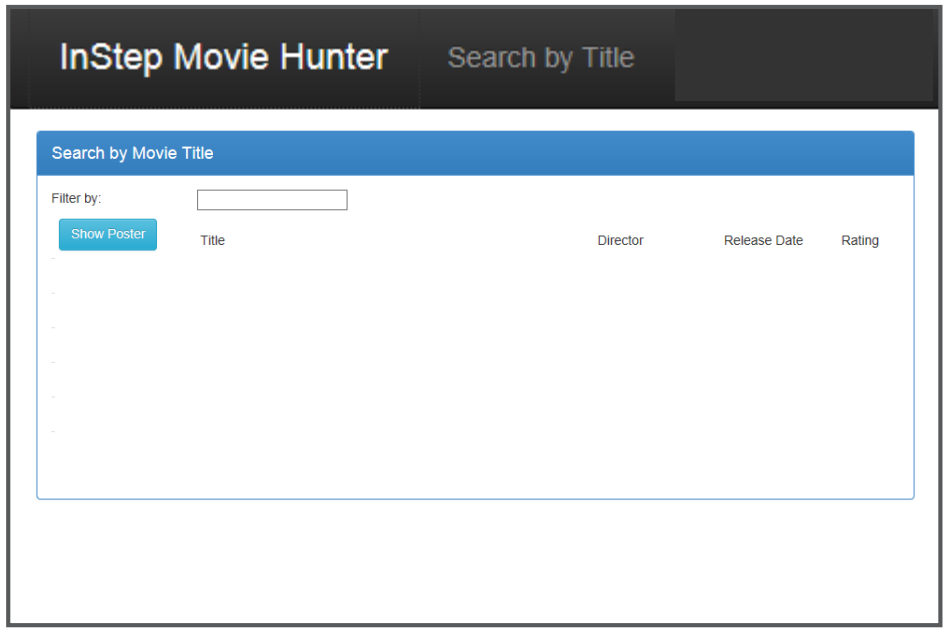


GET Request

`api/movies`

HTTP Service

Data Access



GET Request

`api/movies`

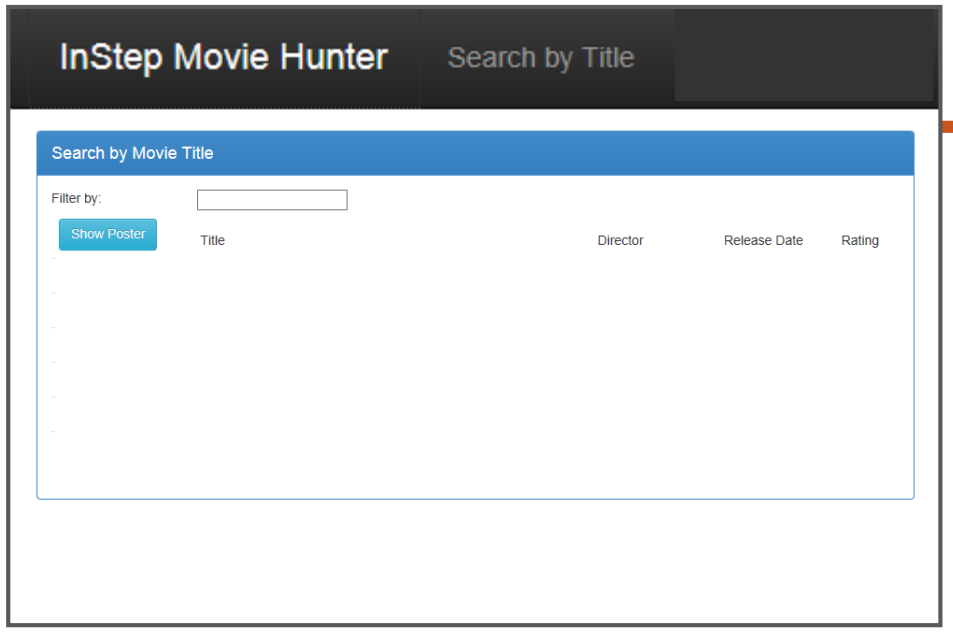
Response

HTTP Service

```
[
 {  director: "Peter Jackson",
    movieId: 1,
    mpaa: "pg-13",
    releaseDate: "2001-12-19T00:00:00",
    title: "The Lord of the Rings: The Fellowship of the Ring"
  },
  { director: "Peter Jackson",
    movieId: 2,
    mpaa: "pg-13",
    releaseDate: "2002-12-18T00:00:00",
    title: "The Lord of the Rings: The Two Towers"
   },
   ...
]
```

Mocking Data Access

`api/movies`

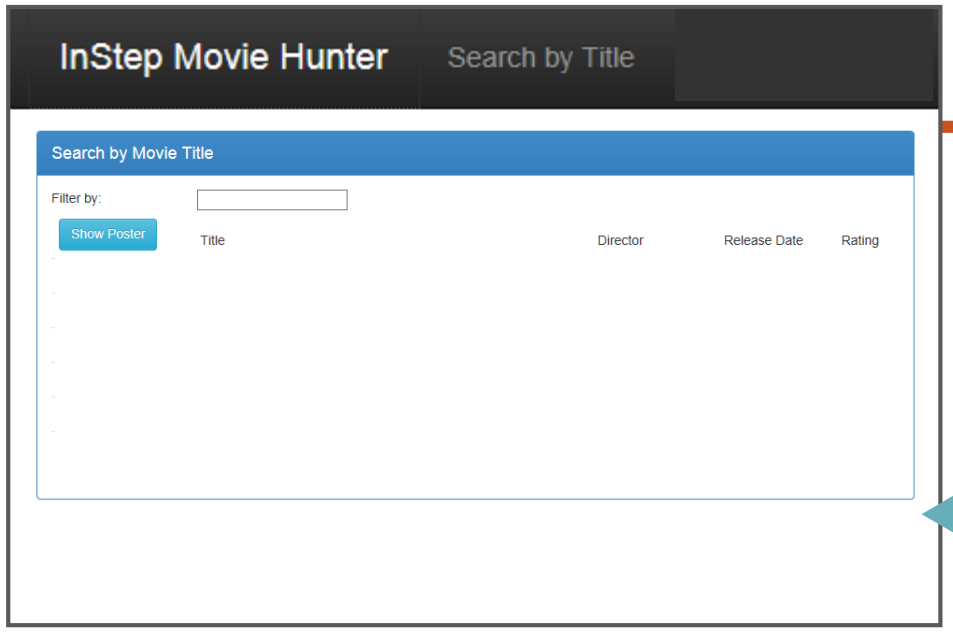


Mocking Service

HTTP Service

Mocking Data Access

api/movies



Mocking Service

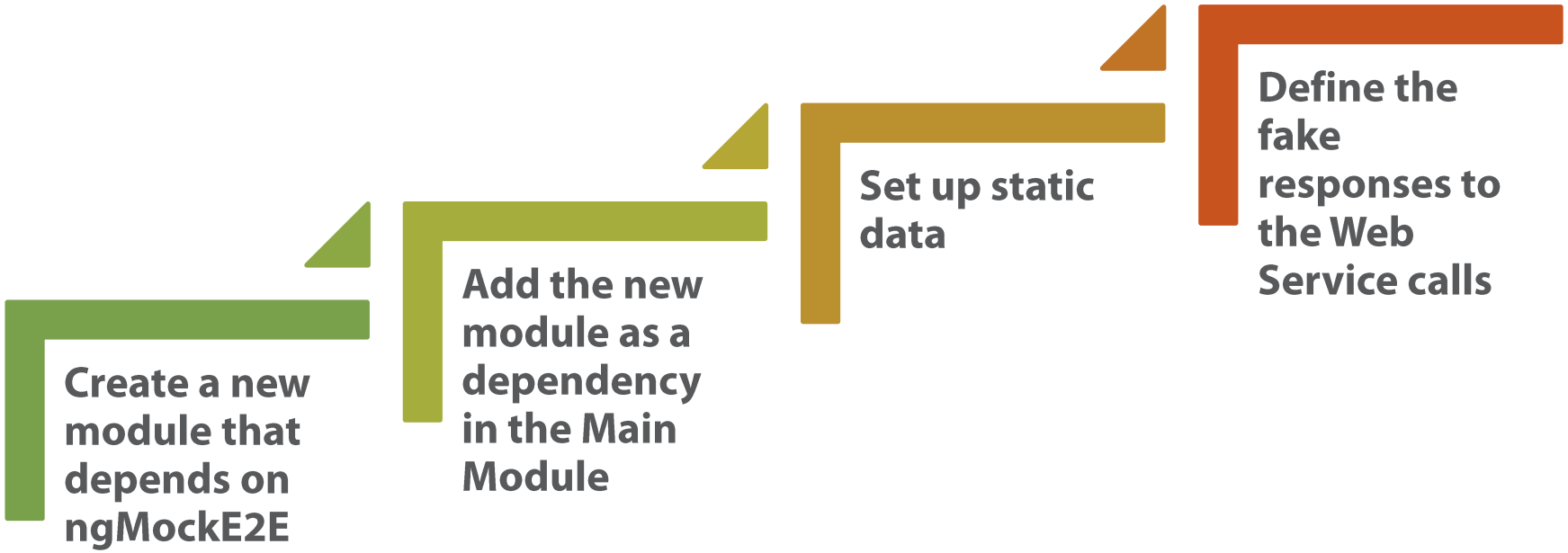
```
[
 {  director: "Peter
Jackson",
    movieId: 1,
    mpaa: "pg-13",
    releaseDate: "2001-12-
19T00:00:00",
    title: "The Lord of the
Rings: The Fellowship of the
Ring"
  },
     ...
]
```

HTTP Service

$httpBackend

- Angular's fake HTTP backend implementation
- Mocks the calls to the Web Service
- Returns static data to the application
- Two implementations:
  - ngMock: for unit testing applications
  - ngMockE2E: for end-to-end testing or backend-less development

Steps to Mocking the Web Server



DEMO:LAB 4

Review – Data Access

Request/Response Flow

JavaScript Promises

Retrieving Data via HTTP Service

Reusable Code: Building a Service

Forms & Validation

Rate Yourself on Forms and Validation

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

Overview – Forms & Validation

Building a Data Entry Form

Performing Validation

Setting Validation Styles

Displaying Validation Messages

DEMO:
FORMS AND VALIDATION

```
<form name="movieForm">
  <fieldset>
    <legend>Edit Movie Information</legend>
  </fieldset>
</form>
```

Creating a Form

It's just HTML

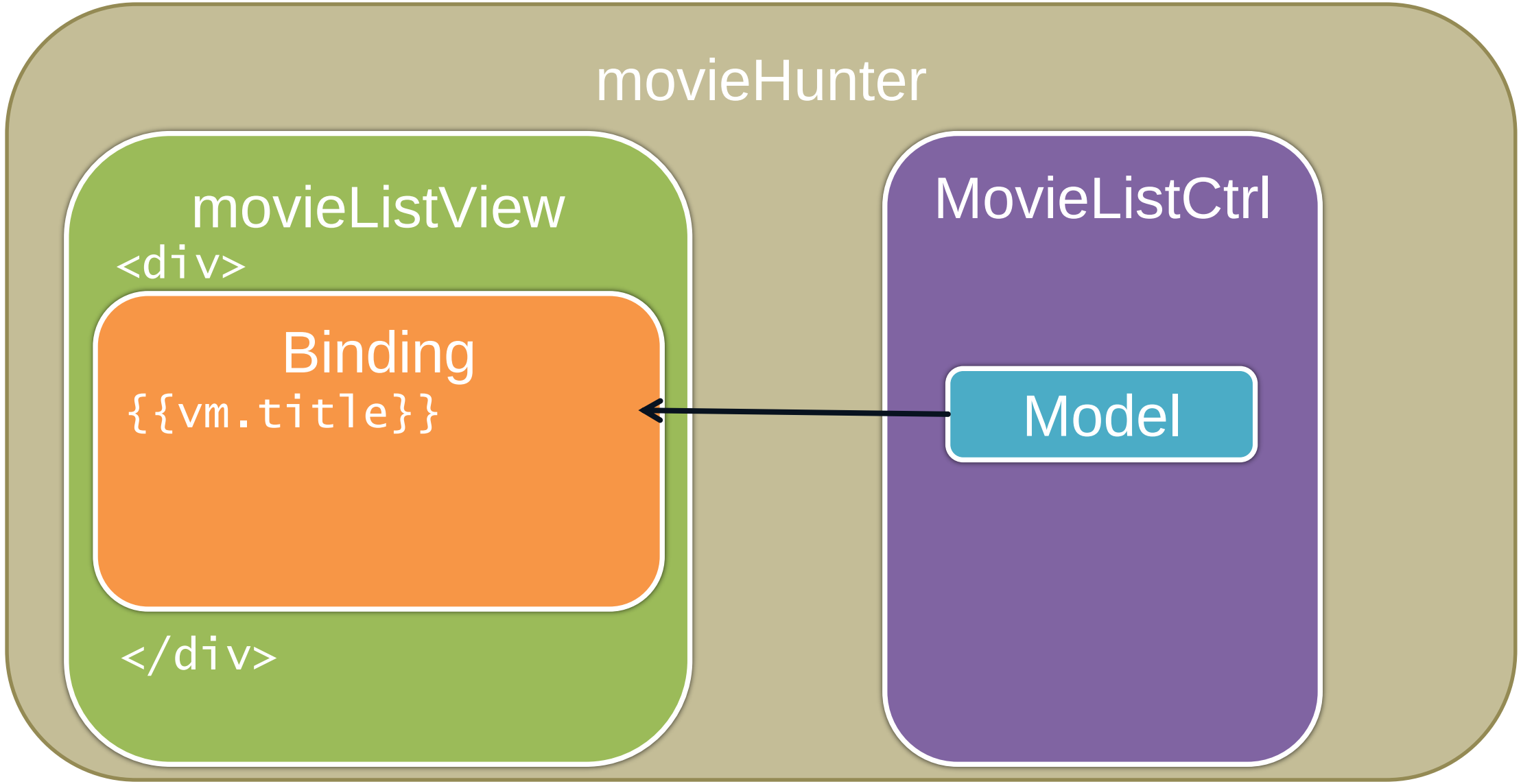
Adding Controls to a Form

```
<div>
  <label for="inputMovieTitle">
         Movie Title</label>
  <input id ="inputMovieTitle“
         type="text"
         placeholder="Movie Title" />
</div>
<div>
  <label for="inputDescription">
         Description</label>
  <textarea id="inputDescription“
            placeholder="Description"
            rows="3" />
</div>
```

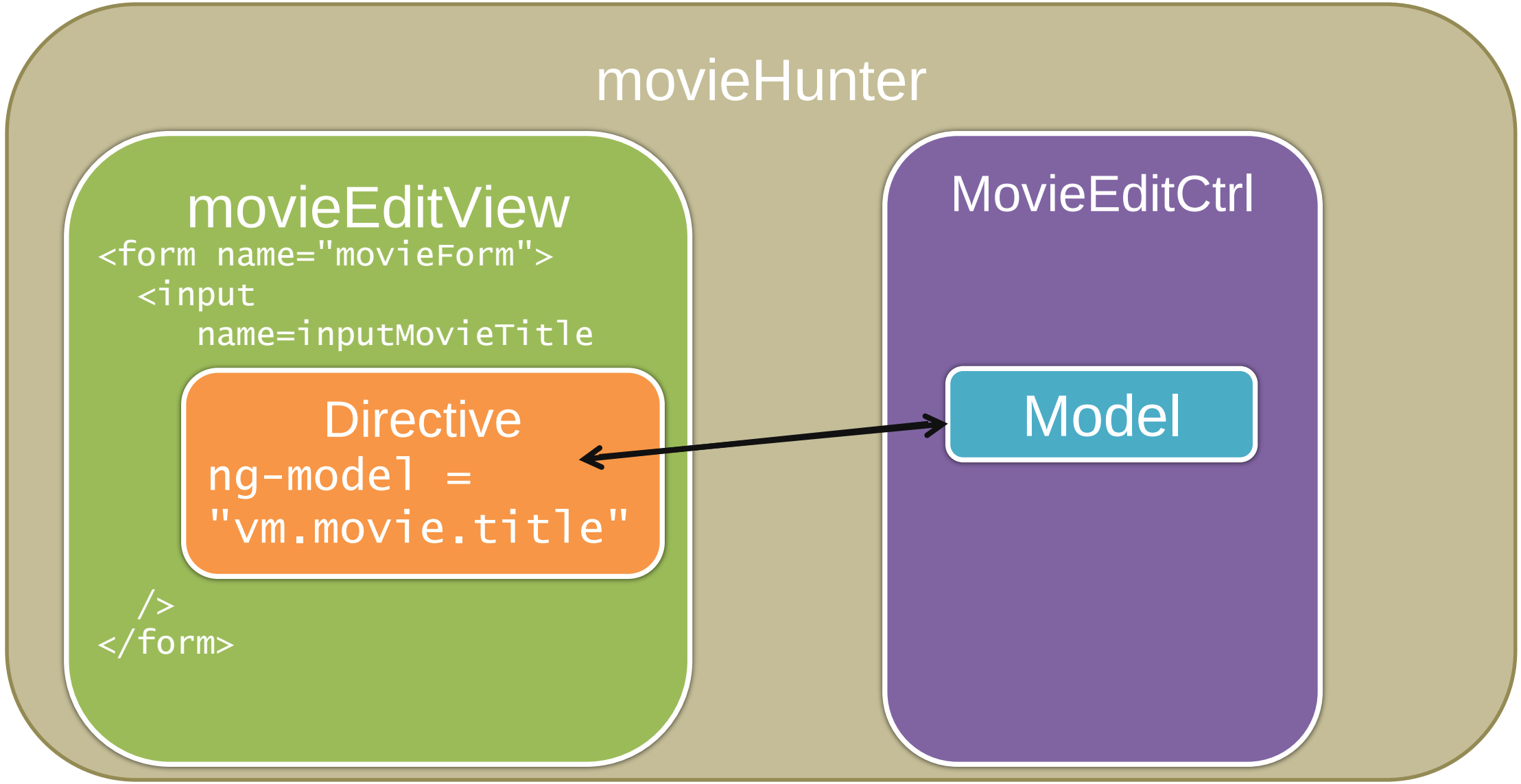
Data Binding

- One-Way Binding
  - View is the projection of the model
  - When the model changes, the view reflects the change
- Two-Way Binding
  - View and model data are synchronized
  - Changes to the model are reflected in the view
  - Changes in the view are reflected in the model

One-Way Binding



Two-Way Binding



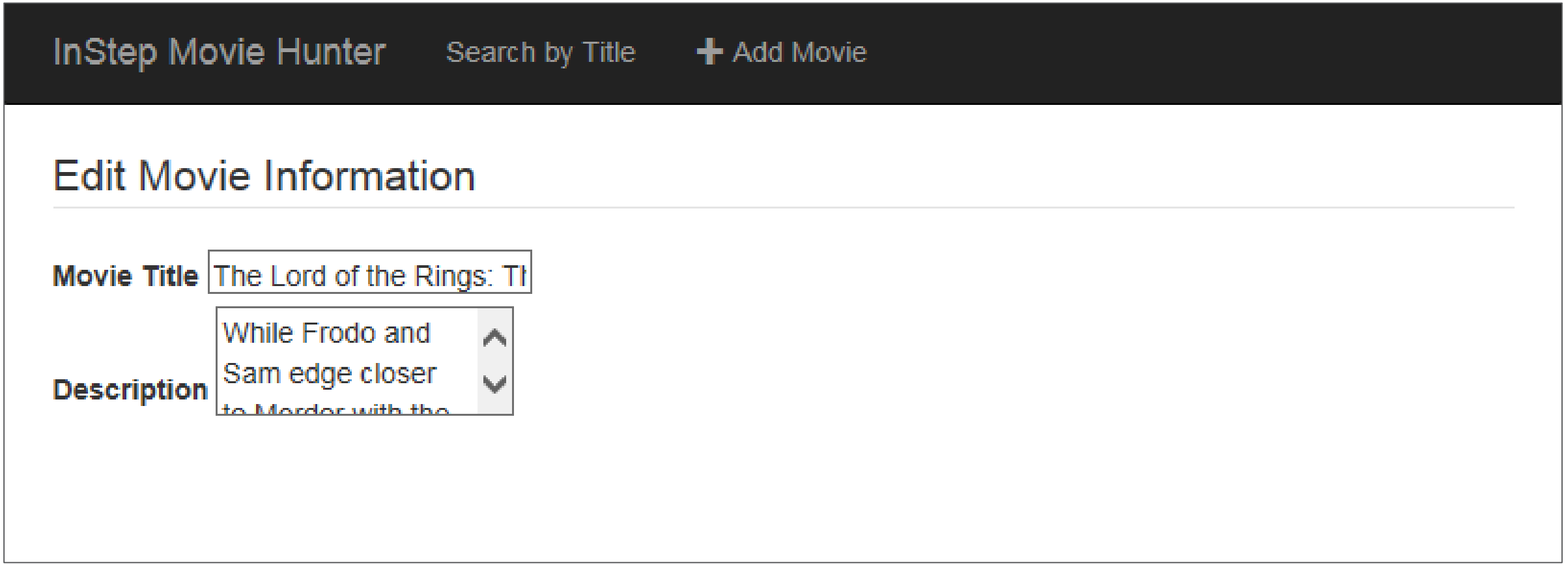
Two-Way Binding

```
<div>
  <label for="inputMovieTitle">
         Movie Title</label>
  <input id ="inputMovieTitle“
         type="text"
         placeholder="Movie Title" />

</div>
<div>
  <label for="inputDescription">
         Description</label>
  <textarea id="inputDescription“
            placeholder="Description"
            rows="3" />

</div>
```

Two-Way Binding

```
<div>
  <label for="inputMovieTitle">
         Movie Title</label>
  <input id ="inputMovieTitle“
         type="text"
         placeholder="Movie Title"
         ng-model="vm.movie.title" />
</div>
<div>
  <label for="inputDescription">
         Description</label>
  <textarea id="inputDescription“
            placeholder="Description"
            rows="3"
            ng-model="vm.movie.description" />
</div>
```

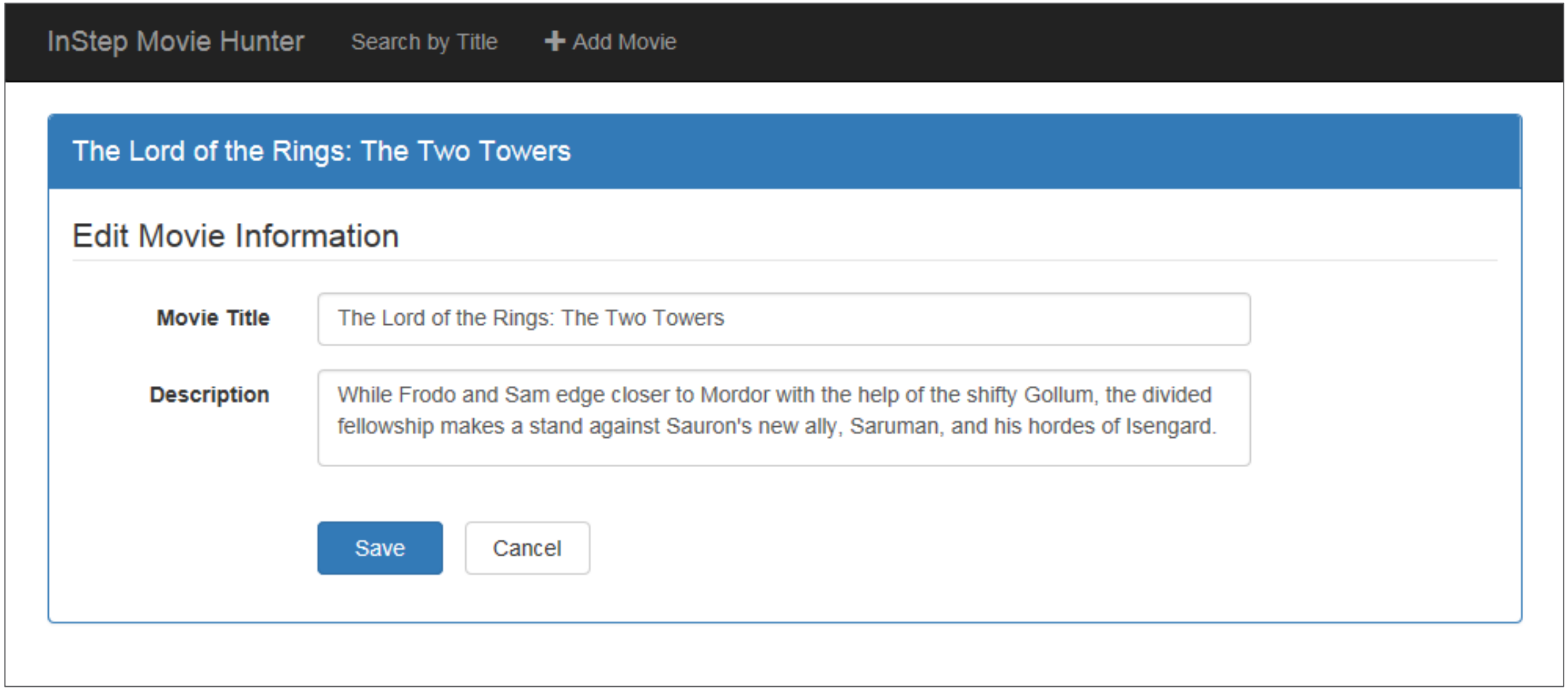
The Result


InStep Movie Hunter
Search by Title
+ Add Movie
Edit Movie Information
Movie Title
The Lord of the Rings: Tl
Description
While Frodo and
Sam edge closer

Bootstrap Styles

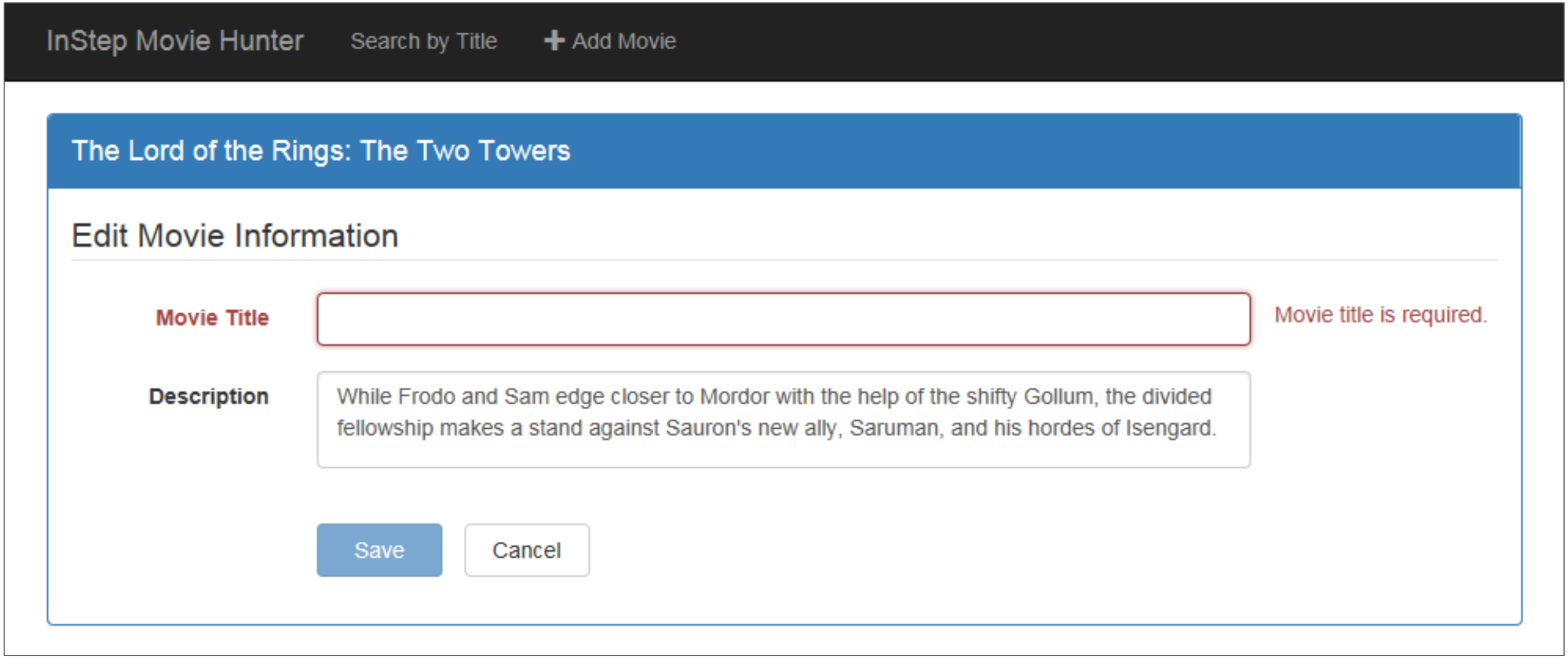
```
<div class="form-group">
  <label class="col-md-2 control-label"
         for="inputMovieTitle">
         Movie Title</label>
  <div class="col-md-6">
      <input class="form-control"
         id ="inputMovieTitle"
         type="text"
         placeholder="Movie Title"
         ng-model="vm.movie.title" />
  </div>
</div>
```

The Result


InStep Movie Hunter
Search by Title
+ Add Movie
The Lord of the Rings: The Two Towers
Edit Movie Information
Movie Title
The Lord of the Rings: The Two Towers
Description
While Frodo and Sam edge closer to Mordor with the help of the shifty Gollum, the divided fellowship makes a stand against Sauron's new ally, Saruman, and his hordes of Isengard.
Save
Cancel

DEMO:
HANDS ON LAB 5-1

Validation


InStep Movie Hunter
Search by Title
+ Add Movie
The Lord of the Rings: The Two Towers
Edit Movie Information
Movie Title
Movie title is required.
Description
While Frodo and Sam edge closer to Mordor with the help of the shifty Gollum, the divided fellowship makes a stand against Sauron's new ally, Saruman, and his hordes of Isengard.
Save
Cancel

Prepare the form

Ensure the form has a name

Set the novalidate attribute

```
<form class="form-horizontal"
      name="movieForm">
      novalidate>
```

Angular Validation Techniques

Type Attribute	`type="email"`
Required Attribute	`required`
HTML Validation Attributes	`min = "1"`
Angular Validation Attributes	`ng-minlength = "3"`
Custom Angular Directive	`my-directive=""`

Validation Attributes

```
<div class="col-md-8">
    <input class="form-control"
           id="inputMovieTitle"
           name="inputMovieTitle"
           type="text"
           placeholder="Title (required)"
           ng-model="vm.movie.title"
           required
           ng-minlength="3"
           ng-maxlength="50" />
</div>
```

Marking Invalid Elements

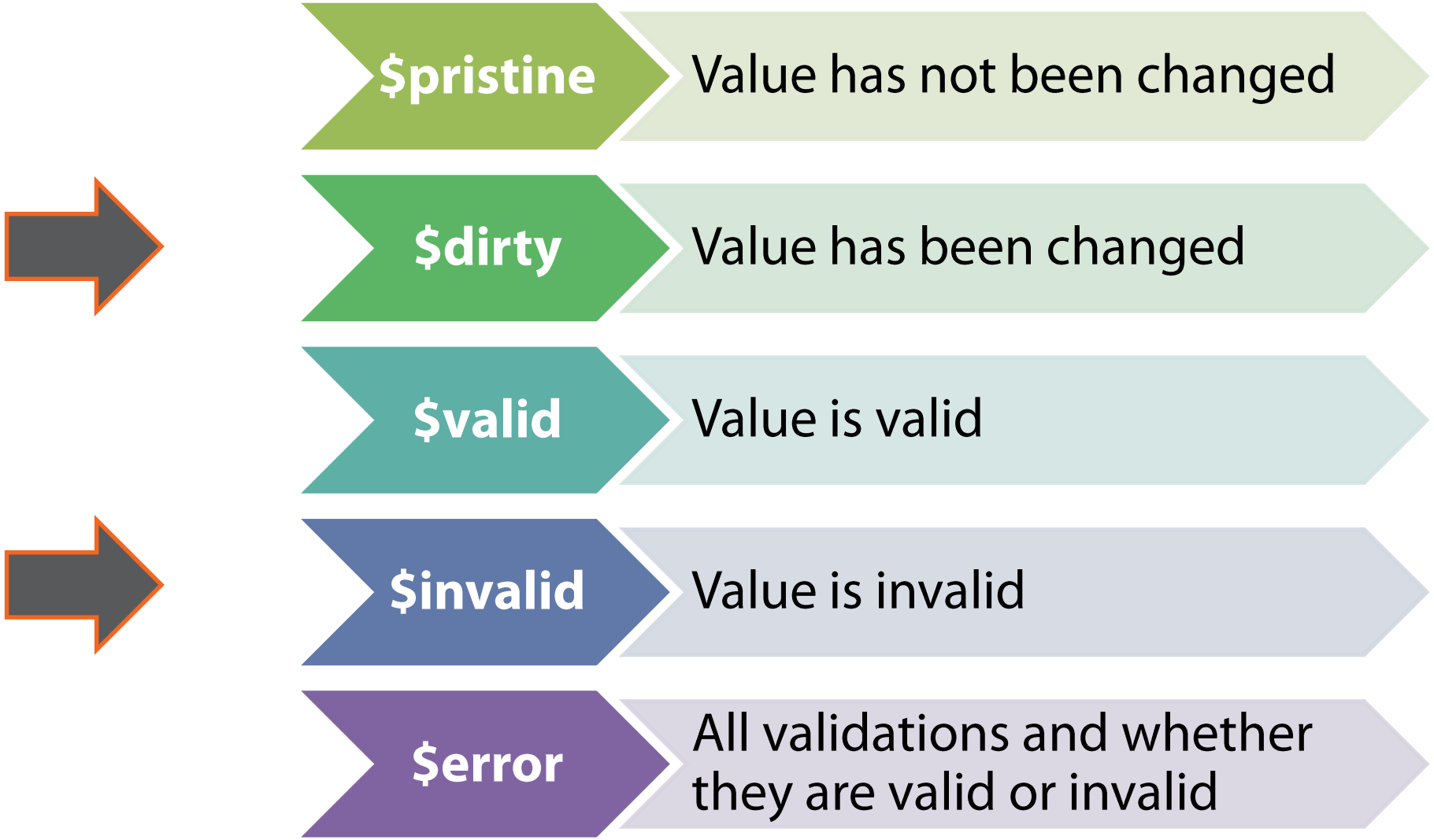
ngClass Directive

Bootstrap Style

Angular Validation States

```
<div class="form-group"
     ng-class="{'has-error':
                movieForm.inputMovieTitle.$invalid &&
                movieForm.inputMovieTitle.$dirty}">

</div>
```

Angular Validation States

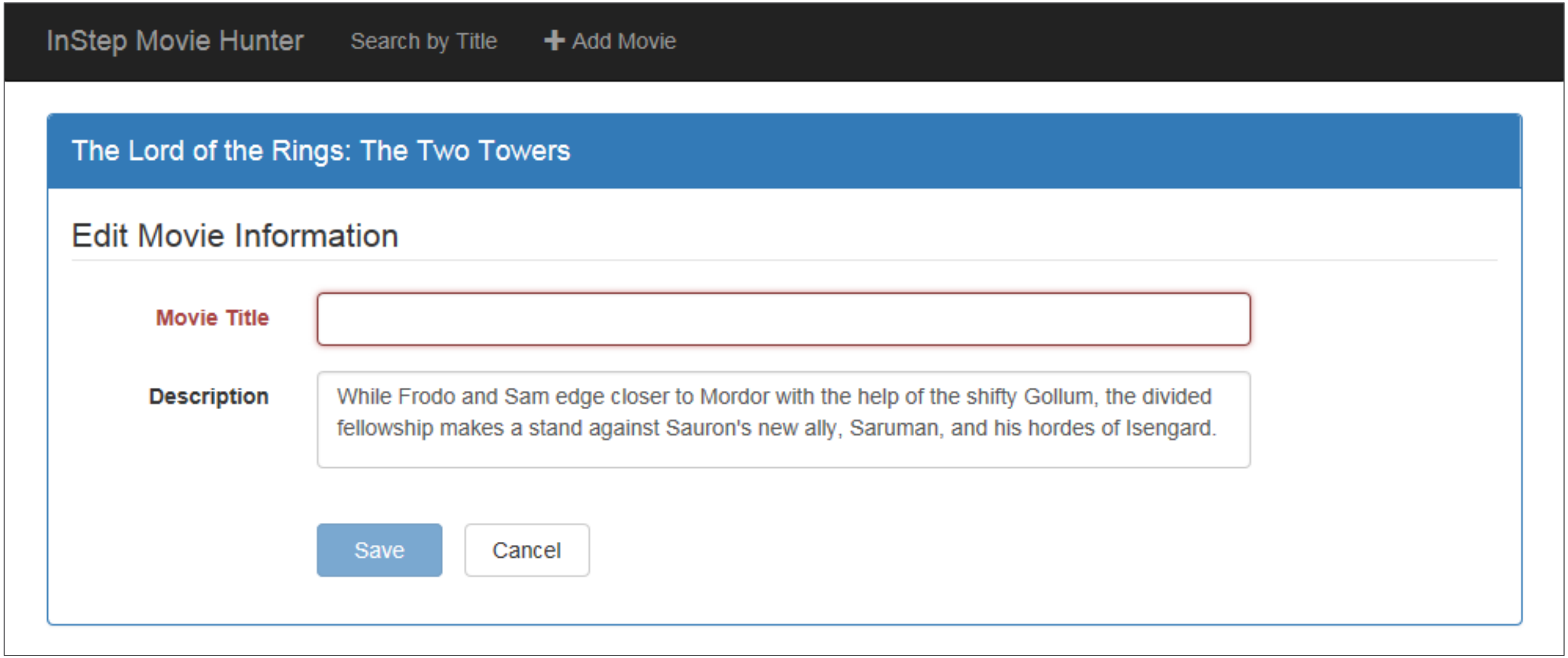


Angular Validation States (New in 1.3)

$touched	Control was "touched" (on blur)
$untouched	Control never "touched" (blur)

DEMO:
HANDS ON LAB 5-2

Validation Messages



ngMessages: New in 1.3

Requires	ng-Messages	ng-Message
• angular-messages • ngMessages	• Shows or hides messages • Similar to a switch or case statement	• Defines specific cases

```
<span class="help-block">
  <span ng-messages="movieForm.inputMovieTitle.$error">
    <span ng-message="required">Movie title is required</span>
    <span ng-message="minlength">Must be at least 3 characters</span>
    <span ng-message="maxlength">Cannot exceed 50 characters</span>
  </span>
</span>
```

Form Group

```
<div class="form-group"
     ng-class="{'has-error':movieForm.inputMovieTitle.$invalid &&
                            movieForm.inputMovieTitle.$dirty}">
  <label class="col-md-2 control-label"
         for="inputMovieTitle">Movie Title</label>
  <div class="col-md-8">
    <input class="form-control"
      id="inputMovieTitle“          name="inputMovieTitle"
      type="text’                   placeholder="Title (required)"
      ng-model="vm.movie.title    required ng-minlength="3“ ng-maxlength="50" />
  </div>
  <span class="help-block“ ng-if="movieForm.inputMovieTitle.$dirty">
    <span ng-messages="movieForm.inputMovieTitle.$error">
      <span ng-message="required">Movie title is required</span>
      <span ng-message="minlength">Movie title must be at least 3 characters</span>
      <span ng-message="maxlength">Movie title cannot exceed 50 characters</span>
    </span>
  </span>
</div>
```

DEMO:
HANDS ON LAB 5-3

Review – Forms & Validation

Building a Data Entry Form

Performing Validation

Setting Validation Styles

Displaying Validation Messages

Take Away

- Expressive HTML
- Powerful Data Binding
- Modularity
- Rule-based Navigation
- Easily Call HTTP Service
- Authoritative Forms

Thank You!

- jerryk@insteptech.com
- https://github.com/JerryKurata/CodeStarsAngular