

Today's Agenda

- Building blocks for creating web sites
 - You can use **layouts** for content shared by **views**
 - **Sections** are for working with content that belongs to individual views
 - You can use **partial views** for fragments of layout you want to inject and reuse across views
 - You can inject dynamic content into views by using **child actions**
- Exercises

Break

- Dividing the application into **Areas** (e.g. public part / administration part)
- Packages, **bundling** and **minification**
- Exercises (continued)

Questions

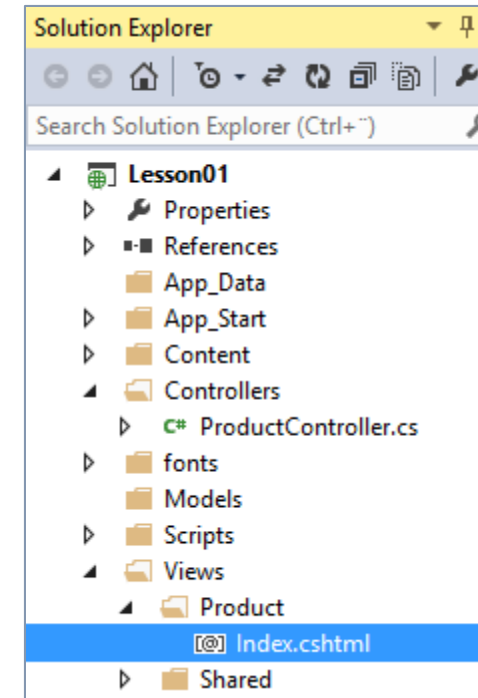
WU-Backend 16a (1wu16aBACK) > Documents > Presentations/[lesson_07 questions.pdf](#)

Views

Folder and file naming conventions for views (sp. 1.1)

Convention over configuration

- Directories
 - Controllers
 - Models
 - Views
- Naming conventions for Controllers
 - Each controller's class name ends with *Controller*: `ProductController`
- Naming conventions for Views
 - Views that controllers use is in a **subfolder** named after the controller and **filename** named after the action method. For example:
`/Views/Product/Index.cshtml`



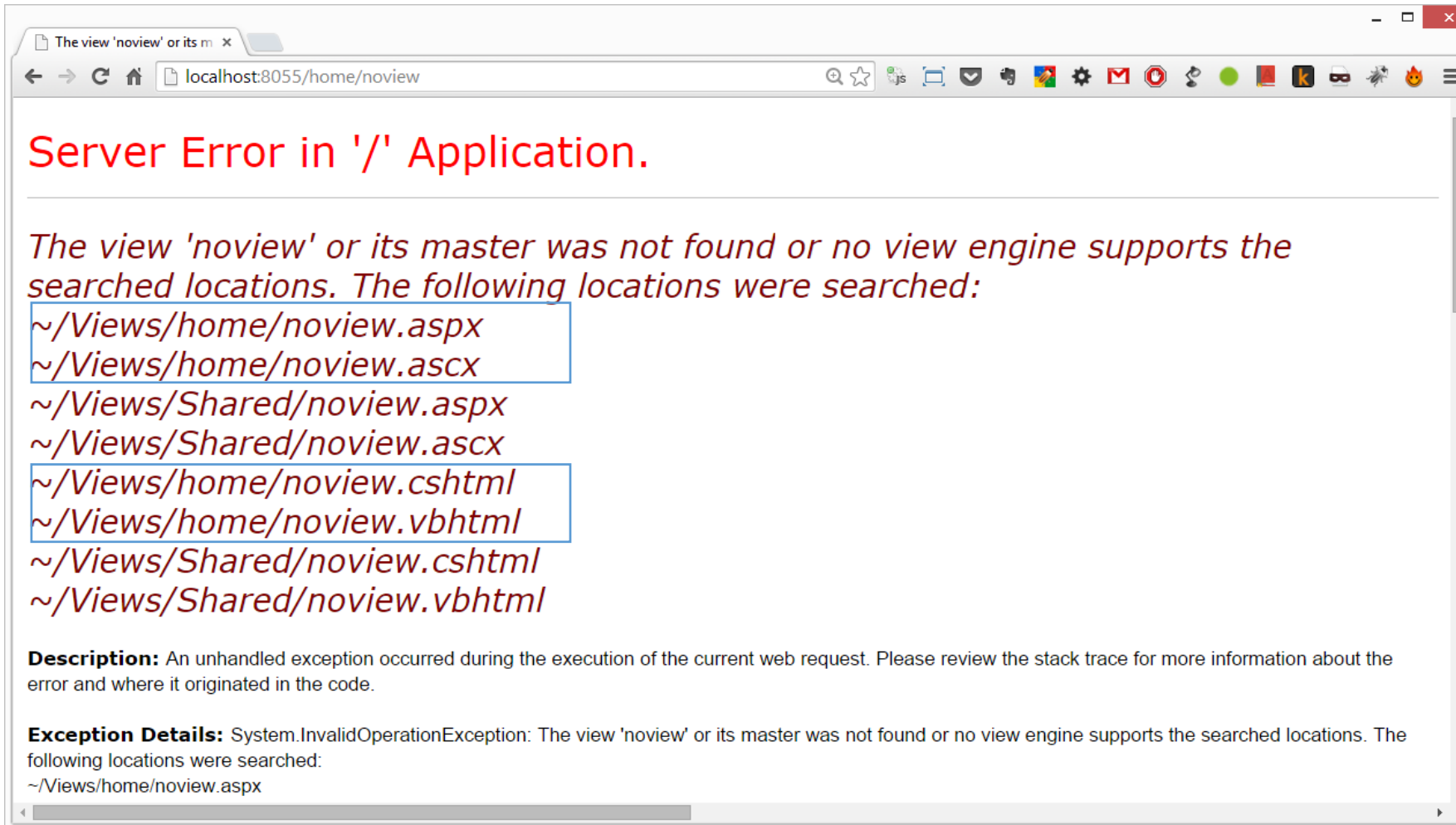
Controller name

Action Method name

View Search Locations (sp. 1.2)

- `~/Views/Home/Index.cshtml`
- `~/Views/Home/Index.vbhtml`
- `~/Views/Shared/Index.cshtml`
- `~/Views/Shared/Index.vbhtml`
- You can **change the locations** of the views by extending the **RazorViewEngine** class (change the **ViewLocationsFormats** property that is set in the constructor) and register the extended class in the **global.asax** file (see Freeman pp. 570-73 for detailed instructions).

The view or its master was not found error



Layout pages

For content shared by views

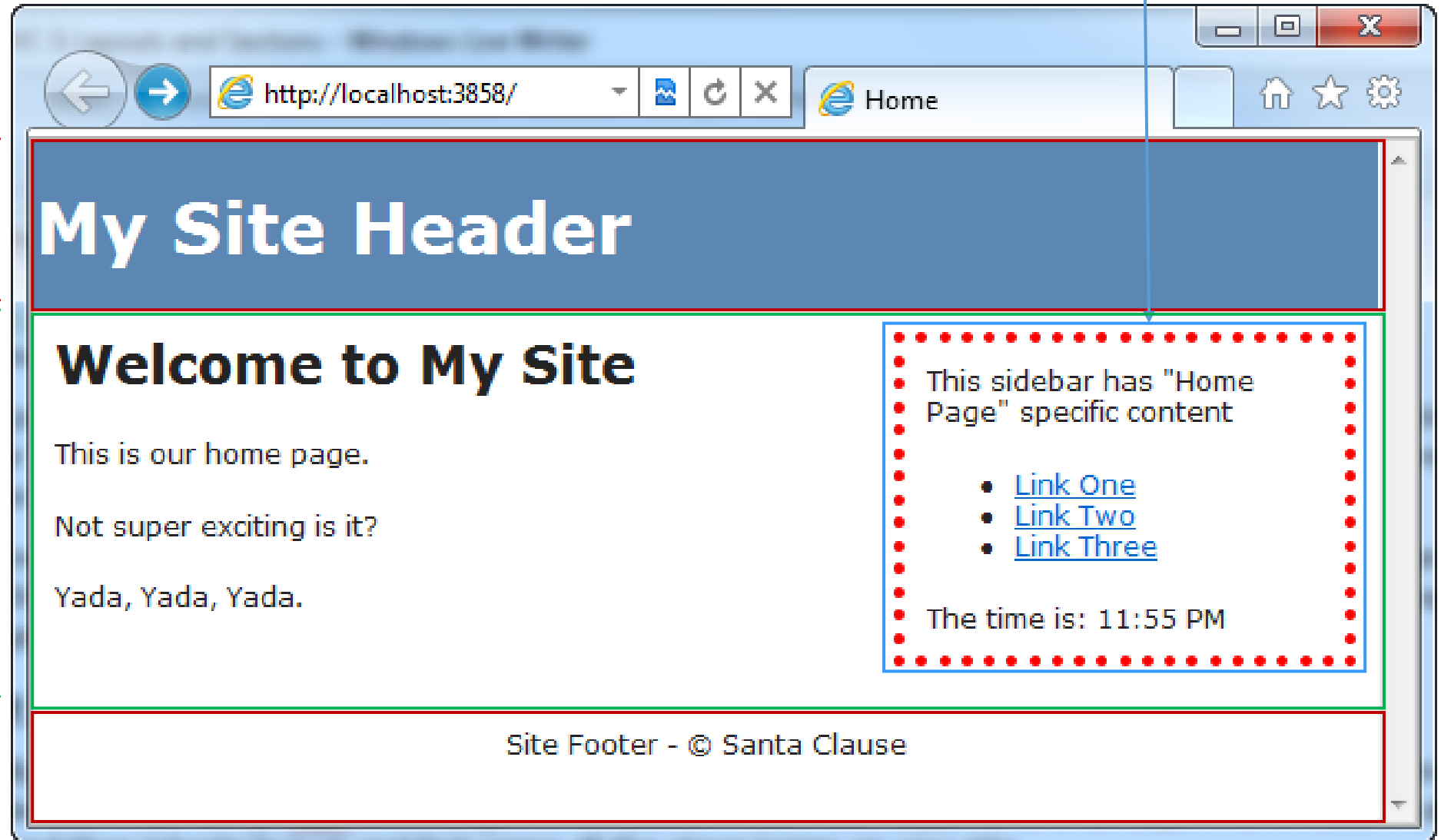
Quick Overview (sp. 2.1)

Child Action returning a Partial View

Layout file

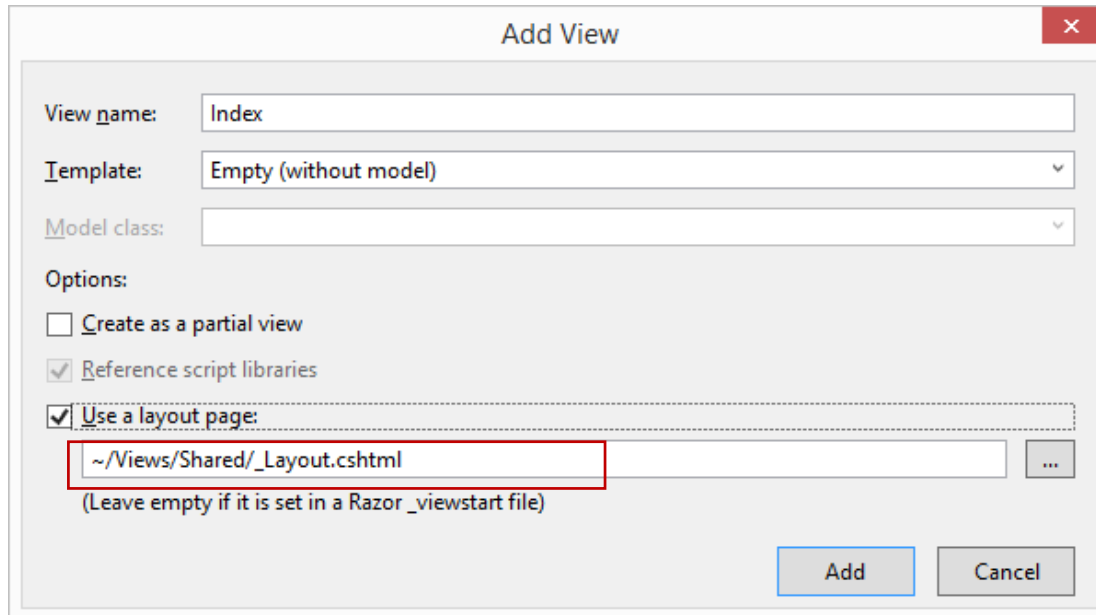
View

Layout file



Layout files (sp. 2.2 + 2.3)

1.



Add View

View name: Index

Template: Empty (without model)

Model class:

Options:

☐ Create as a partial view

☒ Reference script libraries

☒ Use a layout page:

~/Views/Shared/_Layout.cshtml

(Leave empty if it is set in a Razor _viewstart file)

Add Cancel

The first time you check,
Use a layout page
with no file reference, you'll get:

- Contents\bootstrap.css
- Contents\bootstrap.min.css
- Contents\Site.css
- \Shared_Layout.cshtml
- _ViewStart.cshtml

2.

Views_ViewStart.cshtml with content:

```
1 @{
2     Layout = "~/Views/Shared/_Layout.cshtml";
3 }
```

~/Views/Shared/_Layout.cshtml

```
<!DOCTYPE html>
<html>
<head>
    <meta name="viewport" content="width=device-width" />
    <title>@ViewBag.Title</title> <!-- @ViewBag.Title from the view -->
</head>
<body>
    <div id="wrapper">
        <div class="layout">
            This is part of the layout file
        </div>

        @RenderBody() <!-- content from the view goes into this section -->

        <footer>[Insert footer information here]</footer>
    </div>
</body>
</html>
```

The View file (sp. 2.2 + 2.3)

```
@{
    ViewBag.Title = "Lesson 7, examples";
    // Layout file reference
    // Layout = "~/Views/Shared/_Layout.cshtml"
    // Layout = null
    // No layout file reference
    <!-- Goes into the Body-section of the layout file -->
    <p>This is part of the view</p>
```

~/Views/Shared/_Layout.cshtml

- a more elaborated example with sections (sp. 2.4)

```
<!DOCTYPE html>
<html>
<head>
    <meta name="viewport" content="width=device-width" />
    <title>@ViewBag.Title</title>
</head>
<body>
    <div id="wrapper">
        <header>
            // false means that the section is optional; true is default
            @RenderSection("Header", true) // Content for views
        </header>
        <div class="main-content">
            @RenderBody() // Mandatory for all views
        </div>
        <footer>
            @RenderSection("Footer", true) // Content for views
        </footer>
    </div>
    @RenderSection("Scripts", false) </body> // Optional content for views
</html>
```

The view file

- with a `string[]` model sent in from controller

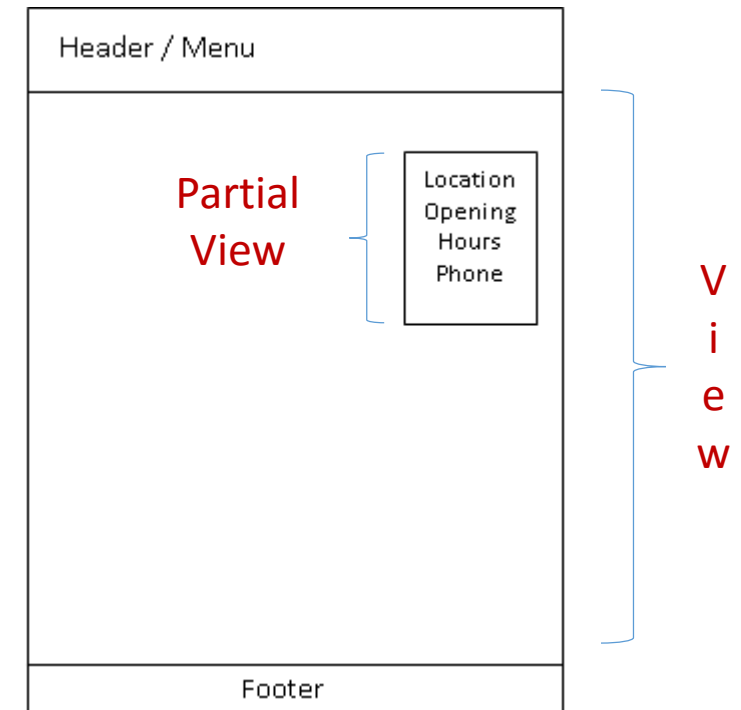
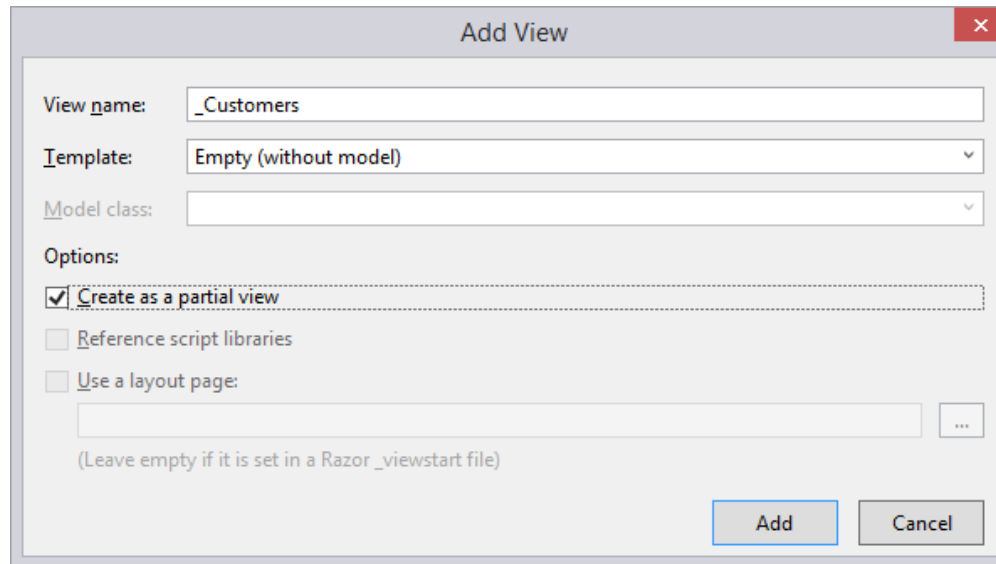
```
Index.cshtml  + X
1  @model string[]
2  @{
3      ViewBag.Title = "Lesson 7, examples";
4
5  }
6  @section Header {
7      <div class="view">
8          @foreach (string str in new[] { "Index", "List", "Edit" }) {
9              @Html.ActionLink(str, str, null, new { style = "margin: 5px" })
10         }
11     </div>
12 }
13 <div class="view">
14     This is a list of fruit names:|
15     @foreach (string name in Model) {
16         <span><b>@name</b></span>
17     }
18 </div>
19 @section Footer {
20     <div class="view">
21         This is the footer from the view
22     </div>
23 }
```

Partial views

Fragments of layout to inject and reuse across views

Partial Views (sp. 3.1+3.2)

- Fragments of markup and data to be **included in other views** (for **re-use**)
- Add a partial view



- Partial views should be located in the **views\[controllernamefolder]** or – if it's **used from more than one view** – in the **views\shared** folder

To Include Partial Views in a View (sp. 3.3)

- You can use html and razor in partial view files as in ordinary view files
- You can include partial view in **views** and **layout files**:

```
@Html.Partial("_PartialPage")
```

- You can also send a model to a partial view

```
@Html.Partial("_PartialPage", Model)
```


The **strongly typed** partial view

```
@model IEnumerable<string>
<div>
    Delicious fruit:
    <ul>
        @foreach (string name in Model) {
            <li>@name</li>
        }
    </ul>
</div>
```

```
@Html.Partial("_Fruit", Model)
```

The partial view

Calling the partial view
from the view

Child actions

Child Actions (sp. 4.1+4.2)

- **Child actions** are to **actions** as **partial views** are to **views**
- You can use **child actions** whenever you have a piece of code you want to use in multiple controller action methods –
Like a data-driven widget (reuse of code that generates dynamic content)
- The child action returns a **partial view to display the data** generated by child action

Child Action Method (sp. 4.3)

```
[ChildActionOnly]
public ActionResult ChildActionExample() {
    string[] myMovies = { "One Flew Over the Cuckoo's Nest",
                          "Schindler's List",
                          "Before Sunrise",
                          "Blue Ruin" };

    return PartialView(myMovies);
}
```

The Partial View (ChildActionExample) (sp. 4.4)

```
@model IEnumerable<string>

<p>
  Movies sent from a <strong>child action</strong>:
  <ul>
    @foreach (string movie in Model) {
      <li style="margin-left:30px;">@movie</li>
    }
  </ul>
</p>
```

Call and display the Child Action (sp. 4.4)

```
// call the same controller that generated the view
@Html.Action("ChildActionExample");

// call another controller
@Html.Action("ChildActionExample", "AnotherController");

// call the same controller & send a data object as parameter
@Html.Action("ChildActionExample", new {name="Sigmund"} );
```

The Razor Engine



- Translates views into **C# classes** and **compiles** the code
 - that's why it is easy to mix HTML code with C# fragments
- The **initial request** to MVC web application triggers **the compilation process of all views**

Exercises

Continuing building the MbmStore website

Mandatory Assignment 2 deadline: **Mandag den 31. oktober**

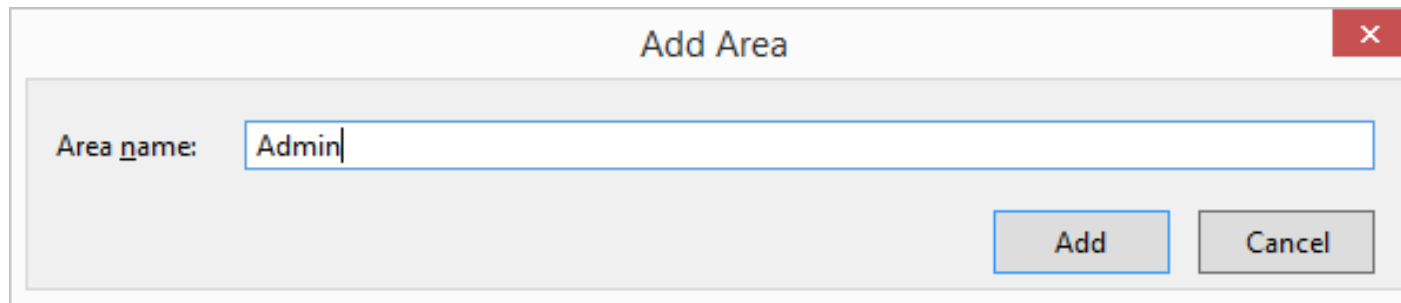
Areas

With Areas you can

- Divide a website into functional **sub-segments** (like administration, billing, customer support etc.)
- Each area can have its **own folder structure** with controllers, models, and views
- **Accessing** a specific area is supported through the **routing system**

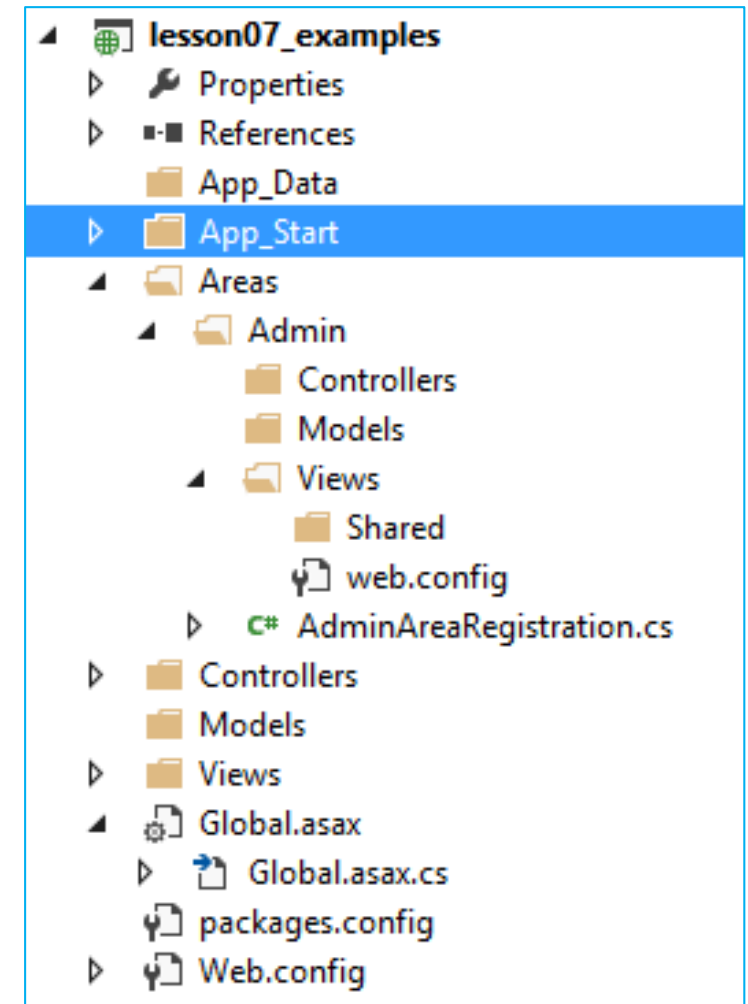
Add an Area

- Add -> Area ...



You'll get:

- A new folder structure
- A **web.config** file in the Views folder
- A **AdminAreaRegistration.cs** file



Admin/AdminAreaRegistration.cs

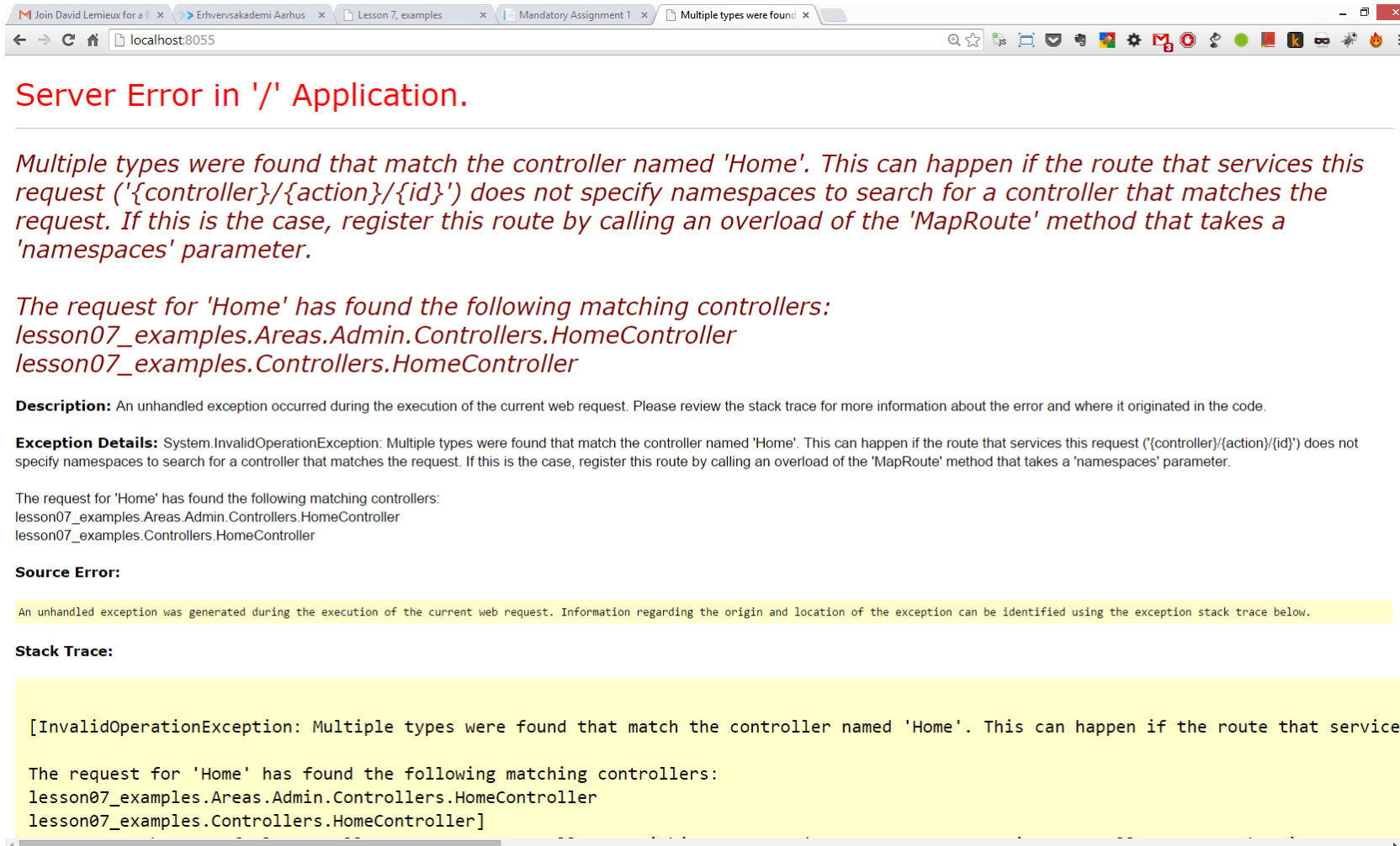
```
public class AdminAreaRegistration : AreaRegistration
{
    public override string AreaName
    {
        get
        {
            return "Admin";
        }
    }

    public override void RegisterArea(AreaRegistrationContext context)
    {
        context.MapRoute(
            "Admin_default",
            "Admin/{controller}/{action}/{id}",
            new { action = "Index", id = UrlParameter.Optional }
        );
    }
}
```

`Global.asax` – check to see that **`AreaRegistration.RegisterAllAreas()`** called

```
public class MvcApplication : System.Web.HttpApplication
{
    protected void Application_Start()
    {
        AreaRegistration.RegisterAllAreas();
        RouteConfig.RegisterRoutes(RouteTable.Routes);
        BundleConfig.RegisterBundles(BundleTable.Bundles);
    }
}
```

Caution: multiple controllers with the same name!



Server Error in '/' Application.

Multiple types were found that match the controller named 'HomeController'. This can happen if the route that services this request ('{controller}/{action}/{id}') does not specify namespaces to search for a controller that matches the request. If this is the case, register this route by calling an overload of the 'MapRoute' method that takes a 'namespaces' parameter.

The request for 'HomeController' has found the following matching controllers:
lesson07_examples.Areas.Admin.Controllers.HomeController
lesson07_examples.Controllers.HomeController

Description: An unhandled exception occurred during the execution of the current web request. Please review the stack trace for more information about the error and where it originated in the code.

Exception Details: System.InvalidOperationException: Multiple types were found that match the controller named 'HomeController'. This can happen if the route that services this request ('{controller}/{action}/{id}') does not specify namespaces to search for a controller that matches the request. If this is the case, register this route by calling an overload of the 'MapRoute' method that takes a 'namespaces' parameter.

The request for 'HomeController' has found the following matching controllers:
lesson07_examples.Areas.Admin.Controllers.HomeController
lesson07_examples.Controllers.HomeController

Source Error:

An unhandled exception was generated during the execution of the current web request. Information regarding the origin and location of the exception can be identified using the exception stack trace below.

Stack Trace:

```
[InvalidOperationException: Multiple types were found that match the controller named 'HomeController'. This can happen if the route that service  
The request for 'HomeController' has found the following matching controllers:  
lesson07_examples.Areas.Admin.Controllers.HomeController  
lesson07_examples.Controllers.HomeController]
```

The cure

1. Use different names (RouteName and controller name) or
2. **Add a namespace** to the controller

```
public static void RegisterRoutes(RouteCollection routes)
{
    routes.IgnoreRoute("{resource}.axd/{*pathInfo}");

    routes.MapRoute(
        name: "Default",
        url: "{controller}/{action}/{id}",
        defaults: new { controller = "Home", action = "Index", id = UrlParameter.Optional },
        namespaces: new[] { "lesson07_examples.Controllers" }
    );
}
```

How to link to a different Area?

```
@Html.ActionLink("Admin", "Index", "Home",  
new {area = "Admin" }, {@class="menu"})
```


CSS, JavaScript

Bundling and minification

Install jQuery

To install jQuery, run the following command in the [Package Manager Console](#)

```
PM> Install-Package jQuery
```

Install Bootstrap

To install Bootstrap, run the following command in the [Package Manager Console](#)

```
PM> Install-Package Twitter.Bootstrap
```

You can ask for specific versions

```
Install-Package jQuery -version 1.10.2
Install-Package jQuery.Validation -version 1.11.1
Install-Package Microsoft.jQuery.Unobtrusive.Validation -version 3.0.0
Install-Package Bootstrap -version 3.0.0
Install-Package Microsoft.jQuery.Unobtrusive.Ajax -version 3.0.0
```

Include CSS and JS in the Layout file

- drag-and-drop from **Solution Explorer**

```
1  <!DOCTYPE html>
2  <html>
3  <head>
4      <meta charset="utf-8" />
5      <meta name="viewport" content="width=device-width" />
6      <title>@ViewBag.Title</title>
7      <link href="~/Content/bootstrap.css" rel="stylesheet" />
8      <link href="~/Content/bootstrap-theme.css" rel="stylesheet" />
9      <script src="~/Scripts/bootstrap.js"></script>
10     <script src="~/Scripts/jquery-1.9.0.js"></script>
11
12     @RenderSection("Scripts", false)
13
14
15 </head>
16 <body>
```

Script and CSS bundles

- **Minifies** JS and CSS files
- Gathers each type **in a single file**
- You'll need to install Microsoft ASP.NET Web Optimization Framework

```
PM> Install-Package Microsoft.AspNet.Web.Optimization
```

Views/web.config

- make the bundle-related classes available within views

```
11 <system.web.webPages.razor>
12   <host factoryType="System.Web.Mvc.MvcWebRazorHostFactory, System.Web.Mvc, Version=5.2.0.0,
13   <pages pageBaseType="System.Web.Mvc.WebViewPage">
14     <namespaces>
15       <add namespace="System.Web.Mvc" />
16       <add namespace="System.Web.Mvc.Ajax" />
17       <add namespace="System.Web.Mvc.Html" />
18       <add namespace="System.Web.Routing" />
19       <add namespace="System.Web.Optimization"/>
20       <add namespace="lesson07_examples" />
21     </namespaces>
22   </pages>
23 </system.web.webPages.razor>
```

App_Start.BundleConfig.cs

– is included in MVC project templates

```
7 namespace lesson07_examples {
8     public class BundleConfig {
9         public static void RegisterBundles(BundleCollection bundles) {
10
11             bundles.Add(new StyleBundle("~/Content/css").Include(
12                 "~/Content/*.css"));
13
14             bundles.Add(new ScriptBundle("~/Scripts/jquery-and-validation")
15                 .Include("~/Scripts/jquery-{version}.js",
16                 "~/Scripts/jquery.validate.js",
17                 "~/Scripts/jquery.validate.unobtrusive.js",
18                 "~/Scripts/jquery.unobtrusive-ajax.js"));
19         }
20     }
21 }
22
```

Bundle name

Scripts to bundle

global.asax

```
1  using System;
2  using System.Collections.Generic;
3  using System.Linq;
4  using System.Web;
5  using System.Web.Mvc;
6  using System.Web.Optimization;
7  using System.Web.Routing;
8
9  namespace lesson07_examples
10 {
11     public class MvcApplication : System.Web.HttpApplication
12     {
13         protected void Application_Start()
14         {
15             AreaRegistration.RegisterAllAreas();
16             RouteConfig.RegisterRoutes(RouteTable.Routes);
17             BundleConfig.RegisterBundles(BundleTable.Bundles);
18         }
19     }
20 }
21
```

Apply bundles to the layout file

```
1 <!DOCTYPE html>
2 <html>
3 <head>
4     <meta charset="utf-8" />
5     <meta name="viewport" content="width=device-width" />
6     <title>@ViewBag.Title</title>
7
8     @Styles.Render("~/Content/css")
9     @Scripts.Render("~/Scripts/jquery-and-validation")
10
11     @RenderSection("Scripts", false)
12
13 </head>
```

References the bundled and minified versions

- HTML source view

```
1 <!DOCTYPE html>
2 <html>
3 <head>
4   <meta charset="utf-8" />
5   <meta name="viewport" content="width=device-width" />
6   <title>Lesson 7, examples</title>
7
8   <link href="/Content/css?v=zrPVifNAvSrIr6vahkfVw1BKAalk61woClq8fPY-6t41" rel="stylesheet"/>
9
10  <script src="/bundles/clientfeaturesscripts?v=R7cnfLpHk-OE7xj5C8NNZX6YQSZDGJ1-2PI2YaVvGk41"></script>
11
12
```

These files are saved in the browser cache one year
or until bundles are updated

CSS (bundled & minified)

```
.btn-default,.btn-primary,.btn-success,.btn-info,.btn-  
warning,.btn-danger{text-shadow:0 -1px 0 rgba(0,0,0,.2);-  
webkit-box-shadow:inset 0 1px 0 rgba(255,255,255,.15),0 1px  
1px rgba(0,0,0,.075);box-shadow:inset 0 1px 0  
rgba(255,255,255,.15),0 1px 1px rgba(0,0,0,.075)}.btn-  
default:active,.btn-primary:active,.btn-success:active,  
.btn-info:active,.btn-warning:active,.btn-danger:active,  
.btn-default.active,.btn-primary.active,.btn-success.  
active,.btn-info.active,.btn-warning.active,.btn-  
danger.active{-webkit-box-shadow:inset 0 3px 5px  
rgba(0,0,0,.125);box-shadow:inset 0 3px 5px  
rgba(0,0,0,.125)}.btn:active,.btn.active{background-  
image:none}.btn-default{text-shadow:0 1px 0  
#fff;background-image:-webkit-gradient(linear,left 0,left  
100%,from(#fff),to(#e0e0e0));background-image:-webkit-  
linear-gradient(top,#fff 0,#e0e0e0 100%);background-image:-  
moz-linear-gradient(top,#fff 0,#e0e0e0 100%);background-  
image:linear-gradient(to bottom,#fff 0,#e0e0e0  
100%);background-repeat:repeat-x;border-color:#dbdbdb;  
border-color:#ccc;filter:progid: DXImageTransform.  
Microsoft.gradient(startColorstr='#ffffff',endColorstr='#  
ffe0e0',GradientType=0);filter:progid:DXImageTransform.Mi  
crosoft.gradient(enabled=false)}.btn-default:hover,.btn-  
default:focus{background-color:#e0e0e0;background-  
position:0 -15px}.btn-default:active,.btn-default.active  
{background-color:#e0e0e0;border-color:#dbdbdb}.btn-  
primary{background-image:-webkit-gradient(linear,left  
0,left 100%,from(#428bca),to(#2d6ca2));background-image:-  
webkit-linear-gradient(top,#428bca 0,#2d6ca2 100%);
```

JavaScript (bundled & minified)

```
(function(n,t){"use strict";function yt(n){var t=n.length,  
r=i.type(n);return i.isWindow(n)?!1:1=== n.nodeType&t?!0:  
"array"===r||"function"!==r&&(0===t||"number"===typeof  
t&&t>0&t-1 in n)}function rf(n){var t=ii[n]={};return  
i.each(n.match(o)||[],function(n,i){t[i]=!0}),t}function  
pi(n,r,u,f){if(i.acceptData(n)){var s,h,c=i.expando,  
a="string"===typeof r,l=n.nodeType,o=l?i.cache:n,  
e=l?n[c]:n[c]&&c;if(e&&o[e]&&(f||o[e].data)||!a||u!==t)retu  
rn e||(l?n[c]=e=w.pop()||i.guid++:e=c),o[e]||(o[e]=  
{},l||(o[e].toJSON=i.noop)),("object"===typeof  
r||"function"===typeof r)&&(f?o[e]=i.extend(o[e],r):  
o[e].data=i.extend(o[e].data,r)),s=o[e],f||(s.data||(s.data  
={}),s=s.data),u!==t&&(s[i.camelCase(r)]=u),a?(h=s[r],null=  
=h&&(h=s[i.camelCase(r)])):h=s,h}}function  
wi(n,t,r){if(i.acceptData(n)){var e,o,h,s=n.nodeType,  
u=s?i.cache:n,f=s?n[i.expando]:i.expando;if(u[f]){if(t&&(e=  
r?u[f]:u[f].data)){for(i.isArray(t)?t=t.concat(i.map(t,i.ca  
melCase)):t in e)?t=[t]:(t=i.camelCase(t),t=t in  
e)?[t]:t.split(" ")),o=0,h=t.length;h>o;o++)delete  
e[t[o]];if(!(r?pt:i.isEmptyObject)(e))return}(r||(delete  
u[f].data,pt(u[f])))&&(s?i.cleanData([n],!0):i.support.dele  
teExpando||u!=u.window?delete u[f]:u[f]=null)}}} function  
bi(n,r,u){if(u===t&&1===n.nodeType){var f="data-  
"+r.replace(nu,"-$1").toLowerCase();if(u=n.  
getAttribute(f),"string"===typeof u){try{u="true"===u?!0  
:"false"===u?!1:"null"===u?null:+u+" "===u?+u:gr.test(u)?i.p  
arseJSON(u):u}catch(e){}i.data(n,r,u)}else u=t}return  
u}function pt(n){var t;for(t in n)if(("data"!==t|| !i.  
isEmptyObject(n[t]))&&"toJSON"!==t)return!1;return!0}
```

... and of course,
JavaScript should be loaded after HTML/CSS content

```
50
51         @RenderSection("Footer", false)
52     </div>
53
54
55     @Scripts.Render("~/Scripts/jquery-and-validation")
56     @RenderSection("Scripts", false)
57
58 </body>
59 </html>
60
```

Exercises (continued)

... mandatory assignment 2