Basic ASP.NET MVC Project

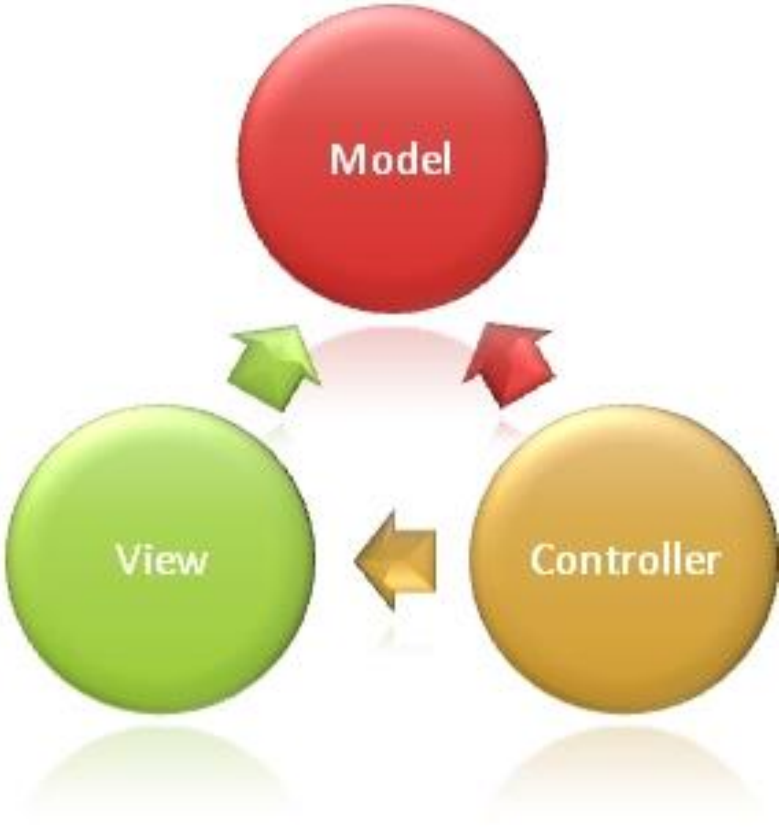
Topics

- ASP.NET MVC
- Routing
- Convention Over Configuration
- Layout

ASP.NET MVC based applications

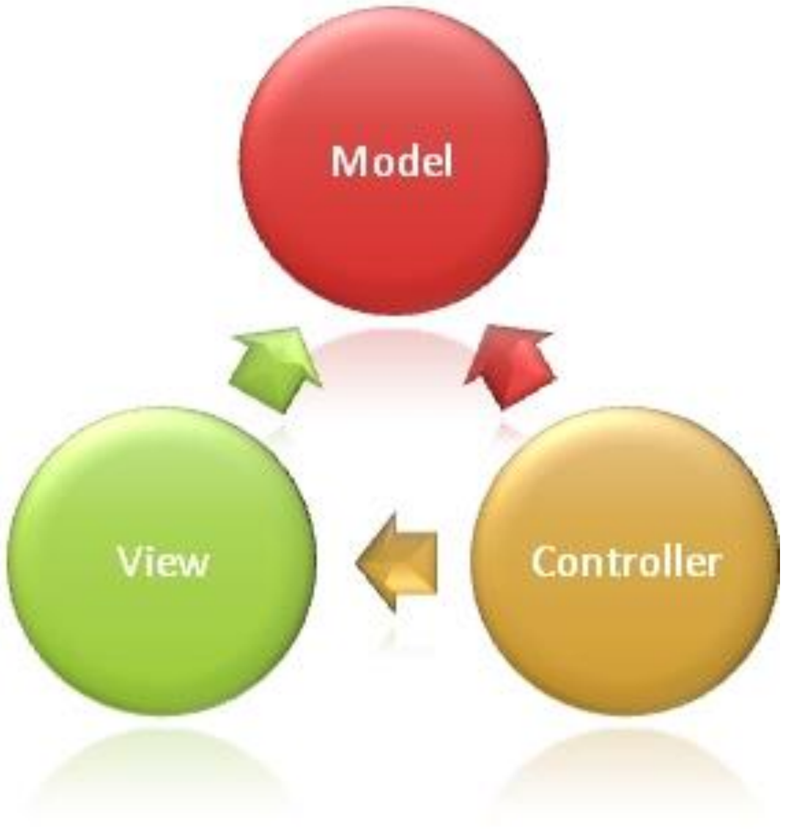
- ASP.NET MVC based applications are made up of:

- **Models:** Composed of classes that model the data of the application. They are often referred to as POCO (Plain Old CLR Objects).
  - They are used to enforce any business logic.
- **Views:** These are template files that generate HTML to sent to the web browser.
  - Deals with displaying data from a model. Ideally, they should not contain any business logic.
- **Controllers:** These are classes that process incoming requests. They obtain data model, and return this data to a view for displaying as HTML.
  - For example, the controller handles query-string values, and passes these values to the model, which in turn queries the database by using the values.



MVC Advantages

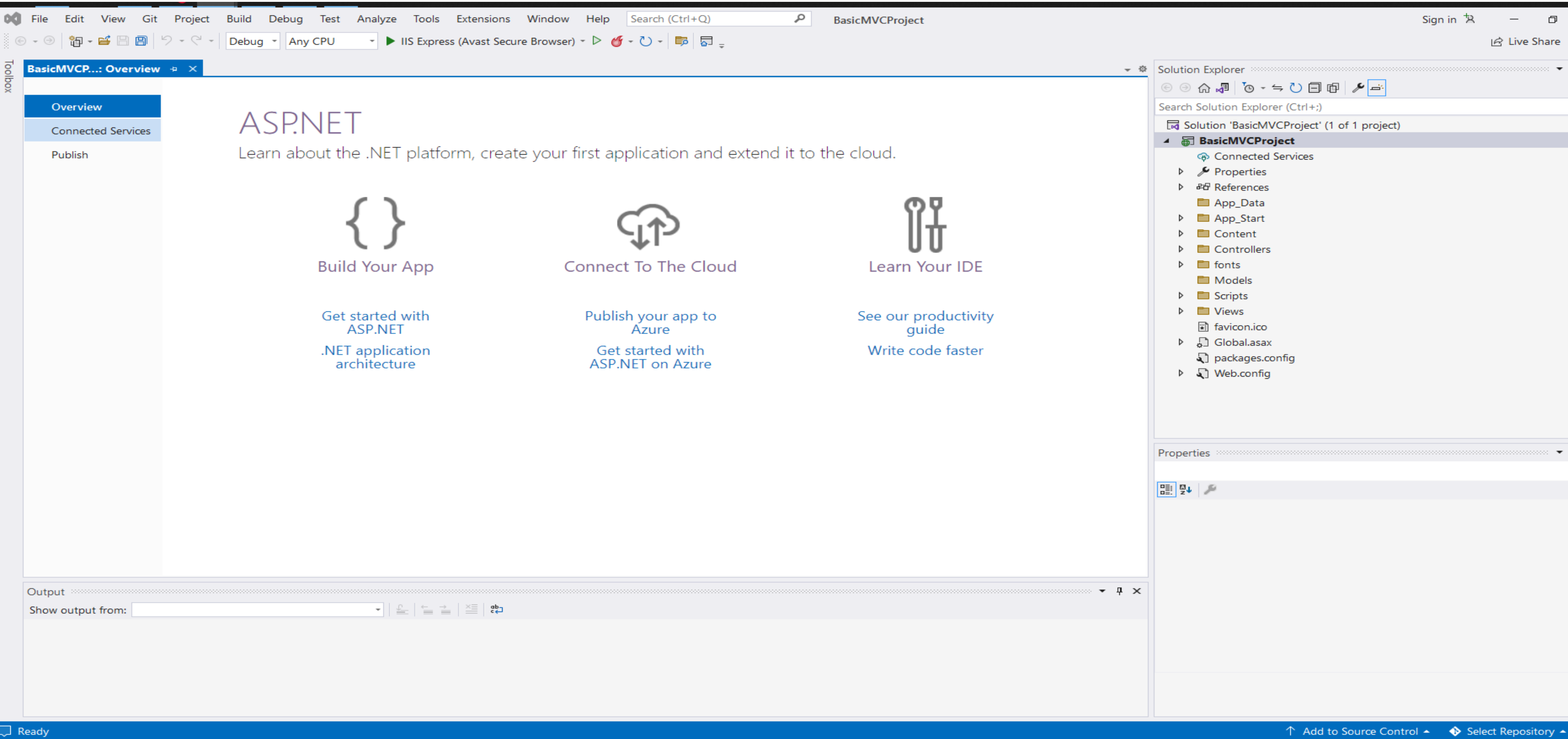
- Separation of concern
- Testable
- Maintainable



ASP.NET MVC Folder Structure

- **App_Data**
  - application data files like LocalDB, .mdf files, XML files, and other data related files
- **App_Start**
  - files that will be executed when the application starts including config files like BundleConfig.cs, FilterConfig.cs, RouteConfig.cs etc
- **Content**
  - static files like CSS files, images, and icons files
- **Controllers**
  - C# class files for the controllers
- **Fonts**
  - custom font files
- **Models**
  - model class files
- **Scripts**
  - JavaScript files
- **Views**
  - *.aspx, *.ascx and *.cshtml files
- **Views\Shared**
  - global Master Pages, Error Pages and User Controls used by multiple controllers
- **Web.config**
  - configurations
- **Packages.config**
  - packages and versions installed in the application

How the Home Page Works



ASP.NET

Learn about the .NET platform, create your first application and extend it to the cloud.

Build Your App

Get started with ASP.NET

.NET application architecture

Connect To The Cloud

Publish your app to Azure

Get started with ASP.NET on Azure

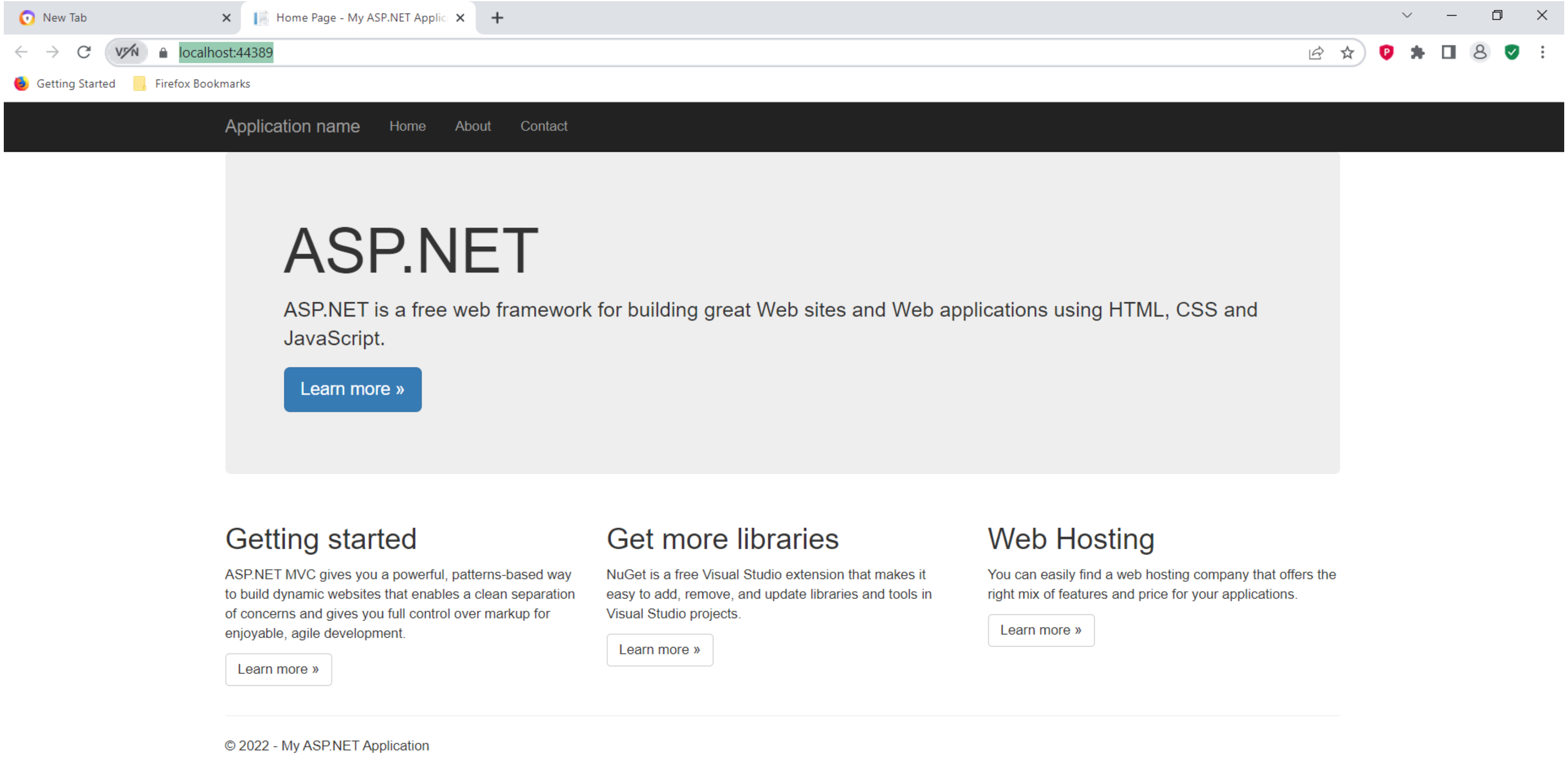
Learn Your IDE

See our productivity guide

Write code faster

Solution 'BasicMVCProject' (1 of 1 project)
- BasicMVCProject
  - Connected Services
  - Properties
  - References
  - App_Data
  - App_Start
  - Content
  - Controllers
  - fonts
  - Models
  - Scripts
  - Views
  - favicon.ico
  - Global.asax
  - packages.config
  - Web.config

How the Home Page Works



ASP.NET

ASP.NET is a free web framework for building great Web sites and Web applications using HTML, CSS and JavaScript.

Learn more »

Getting started

ASP.NET MVC gives you a powerful, patterns-based way to build dynamic websites that enables a clean separation of concerns and gives you full control over markup for enjoyable, agile development.

Learn more »

Get more libraries

NuGet is a free Visual Studio extension that makes it easy to add, remove, and update libraries and tools in Visual Studio projects.

Learn more »

Web Hosting

You can easily find a web hosting company that offers the right mix of features and price for your applications.

Learn more »

© 2022 - My ASP.NET Application

Routing

- ASP.NET MVC uses ASP.NET routing to control how the application translates URLs. It also controls which controllers and methods the incoming HTTP requests target and hence which views to display.
- RouteConfig.cs file, which is located in the App_Start folder. The code contained in this file defines rules that the application uses to target the correct controller and method depending on the URL entered into the web browser.

App_Start\RouteConfig.cs

```
using System.Web.Mvc;
using System.Web.Routing;

namespace BasicMVCProject
{
    public class RouteConfig
    {
        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 }
            );
        }
    }
}
```

Global.assx

```
using System.Web.Mvc;
using System.Web.Optimization;
using System.Web.Routing;

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

How the Home Page Works?

- The home page shown above is displayed because the web site made a request to the URL /home/Index.
- If you add /home/index to the end of the URL, the page displayed will not be changed.
- The URL tells the MVC Web Application that a request has been made to the Index action method of the Home Controller.
- The method is found in the HomeController.cs file which contains a simple line of code return View() and this tells the website to open the corresponding view.

HomeController.cs

```
using System.Web.Mvc;

namespace BasicMVCProject.Controllers
{
    public class HomeController : Controller
    {
        public ActionResult Index()
        {
            return View();
        }

        public ActionResult About()
        {
            ViewBag.Message = "Your application description page.";

            return View();
        }

        public ActionResult Contact()
        {
            ViewBag.Message = "Your contact page.";

            return View();
        }
    }
}
```

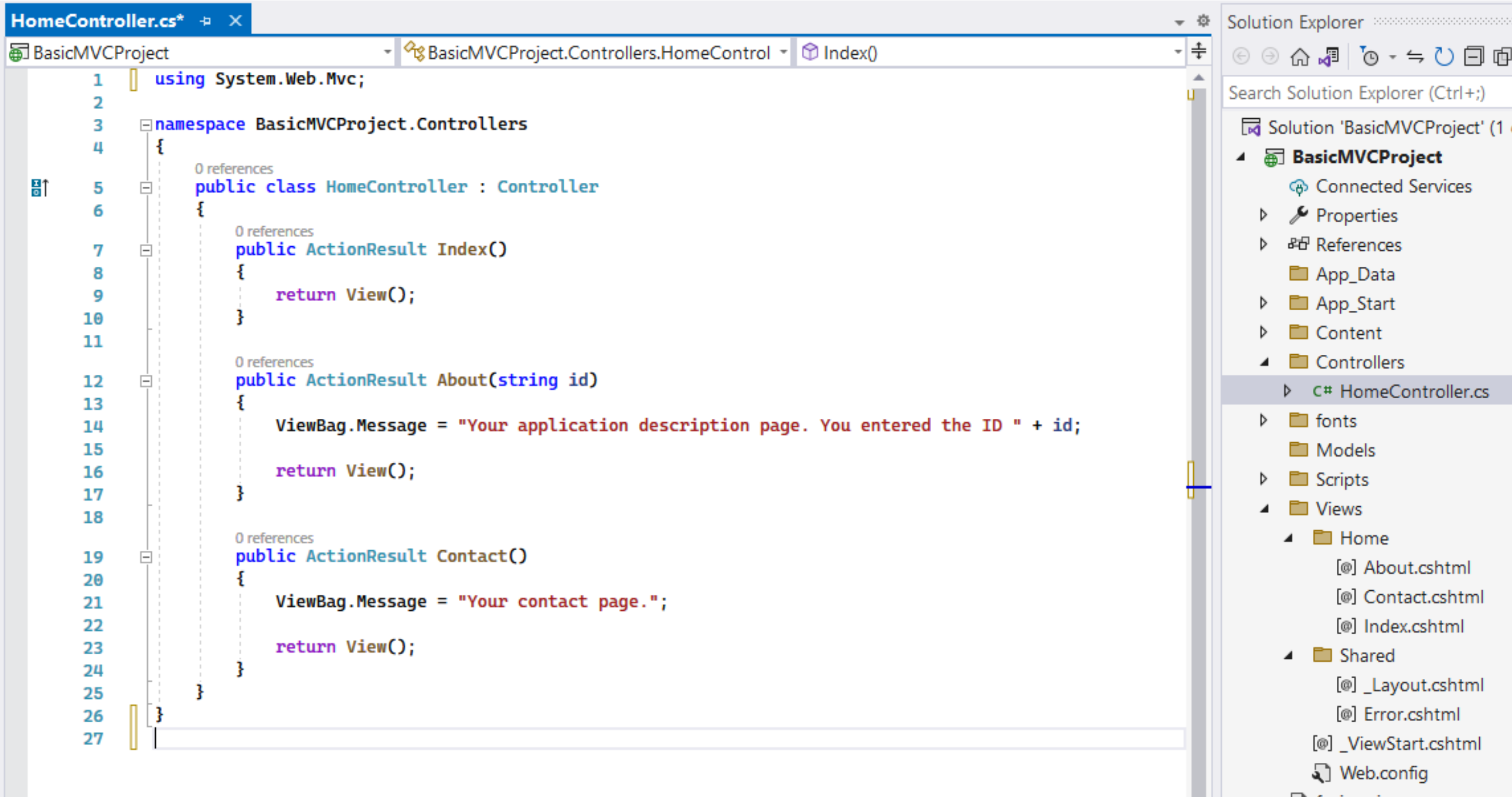
Home

- The corresponding view file is found under Views\Home\Index.cshtml.
- By convention, this is how ASP.NET MVC projects work with the default view for a controller method found in the **Views\ControllerName\MethodName.cshtml** path.
- The Views\Home\Index.cshtml file contains the HTML corresponding to the text shown in the home page.

HomeController.cs

URL /Home/Index. By convention, ASP.NET MVC projects work with the default view for a controller method found in the path:

- Views\ControllerName\MethodName.cshtml
- Views\Home\Index.cshtml

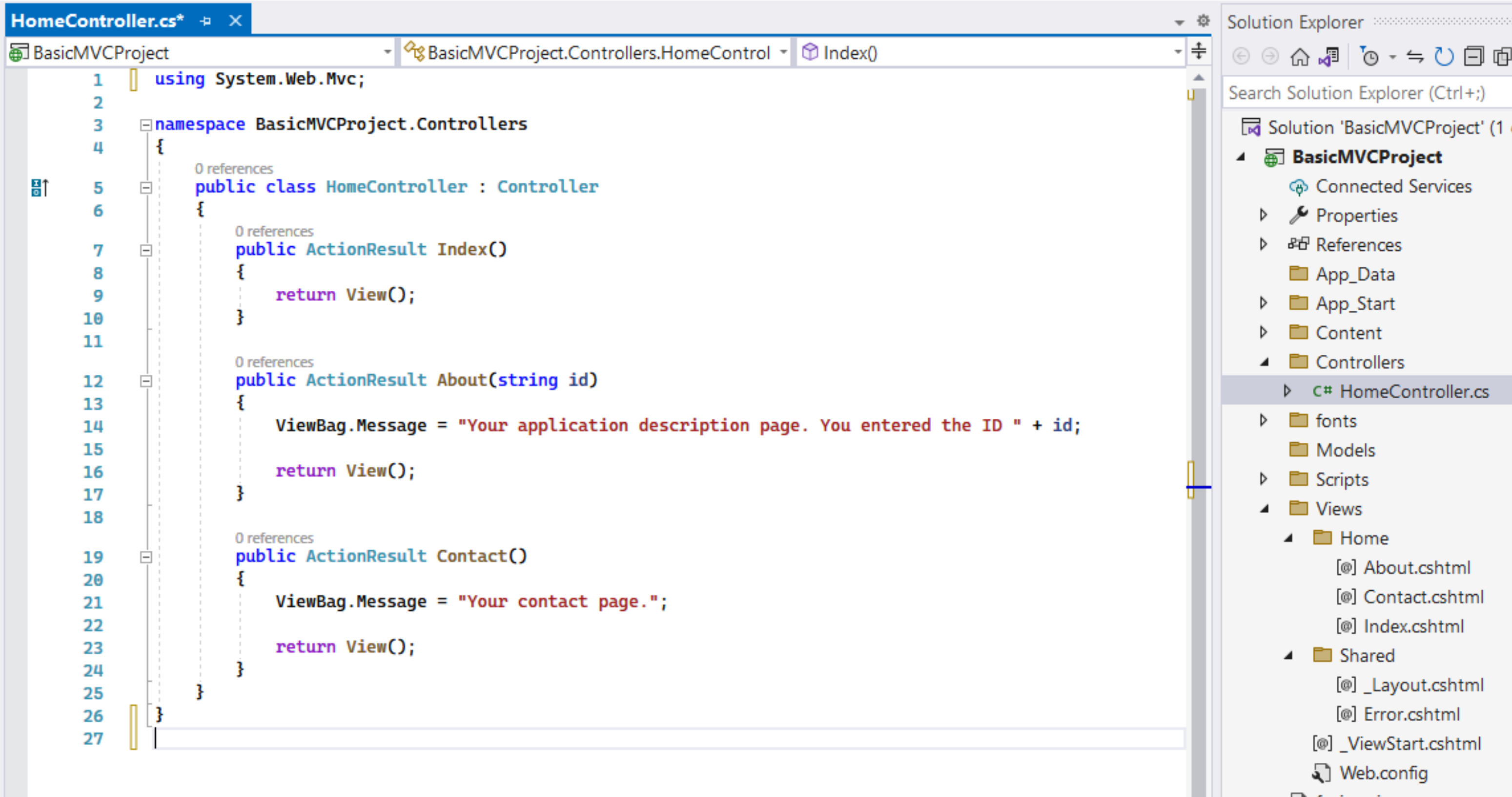


```
using System.Web.Mvc;

namespace BasicMVCProject.Controllers
{
    0 references
    public class HomeController : Controller
    {
        0 references
        public ActionResult Index()
        {
            return View();
        }

        0 references
        public ActionResult About(string id)
        {
            ViewBag.Message = "Your application description page. You entered the ID " + id;

            return View();
        }

        0 references
        public ActionResult Contact()
        {
            ViewBag.Message = "Your contact page.";

            return View();
        }
    }
}
```

HomeController.cs

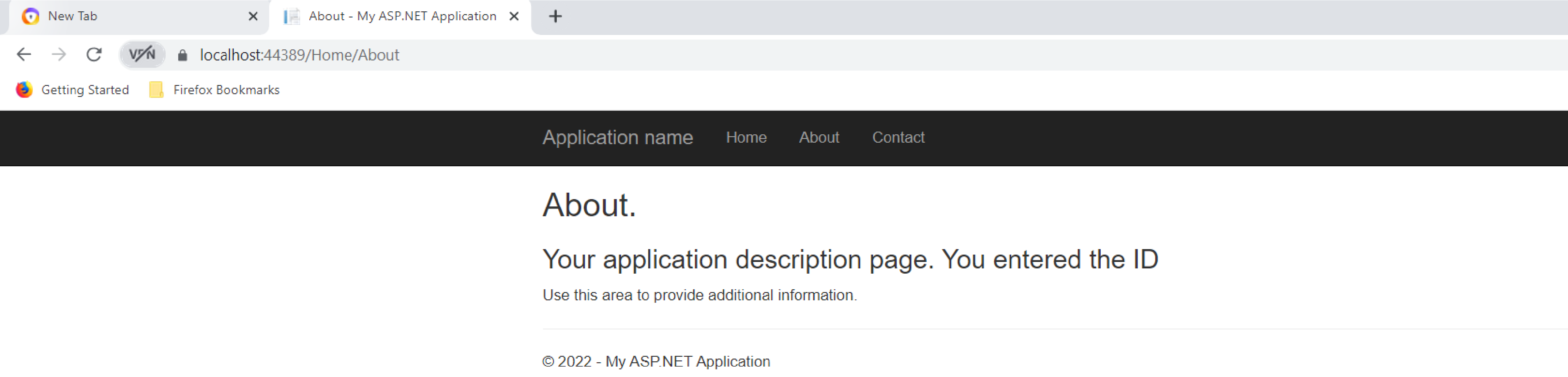
Views\ControllerName\MethodName.cshtml

- URL /Home/About =>Views\Home\ About.cshtml
- URL /Home/Contact =>Views\Home\Contact.cshtml



```
using System.Web.Mvc;

namespace BasicMVCProject.Controllers
{
    public class HomeController : Controller
    {
        public ActionResult Index()
        {
            return View();
        }

        public ActionResult About(string id)
        {
            ViewBag.Message = "Your application description page. You entered the ID " + id;

            return View();
        }

        public ActionResult Contact()
        {
            ViewBag.Message = "Your contact page.";

            return View();
        }
    }
}
```

About



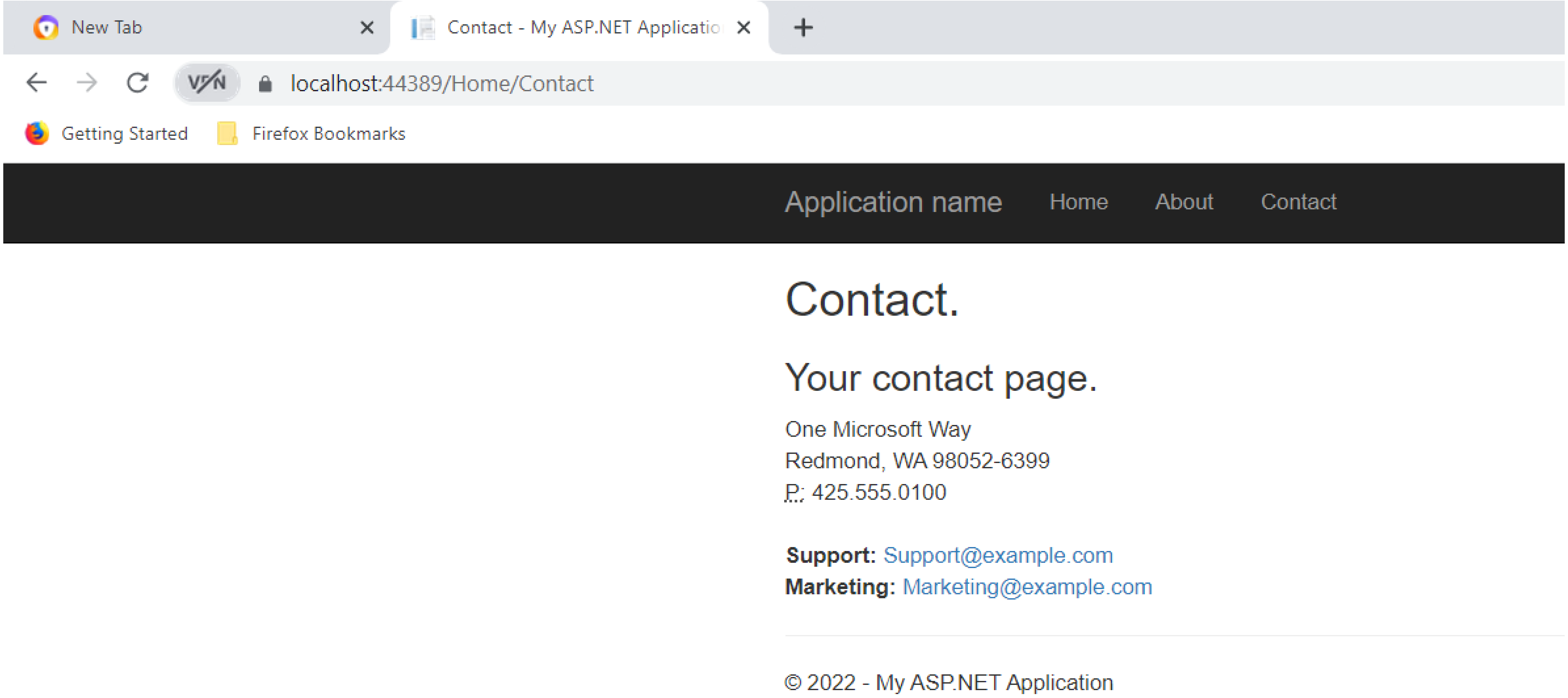
About.

Your application description page. You entered the ID

Use this area to provide additional information.

© 2022 - My ASP.NET Application

Contact



Contact.

Your contact page.

One Microsoft Way
Redmond, WA 98052-6399
P: 425.555.0100

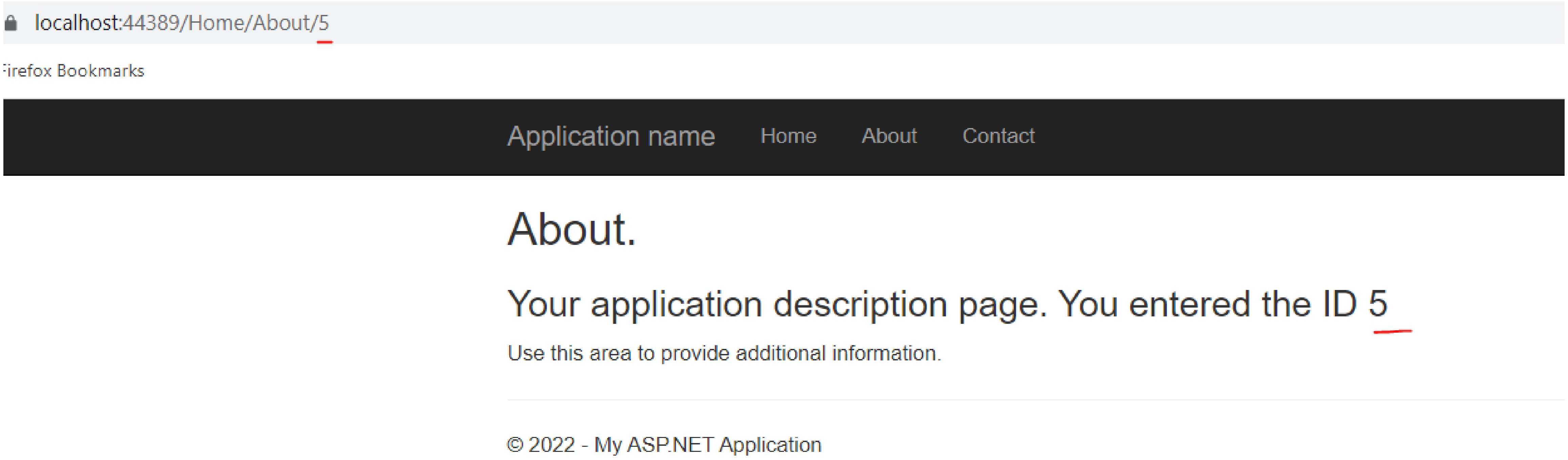
Support: Support@example.com
Marketing: Marketing@example.com

© 2022 - My ASP.NET Application

Convention Over Configuration

- ASP.NET MVC follows Convention Over Configuration principle for naming.
- Coding by Convention
- a software design paradigm
- don't repeat yourself (DRY) principles

https://localhost:44389/Home/About/5



About.

Your application description page. You entered the ID 5

Use this area to provide additional information.

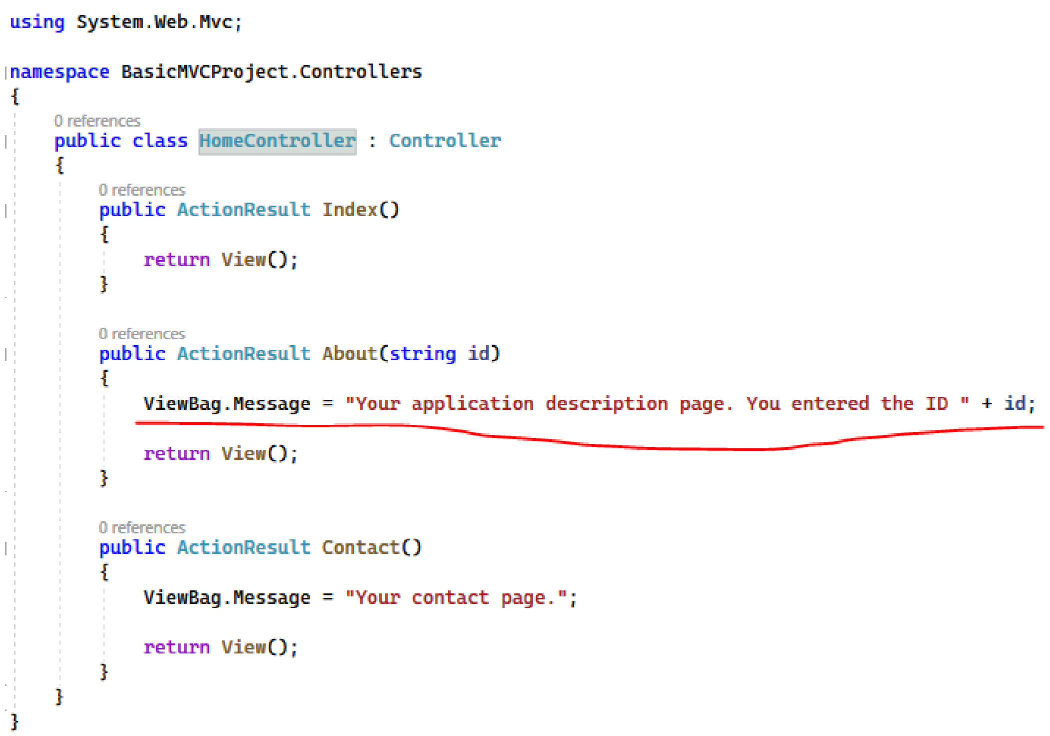
© 2022 - My ASP.NET Application

HomeController.cs

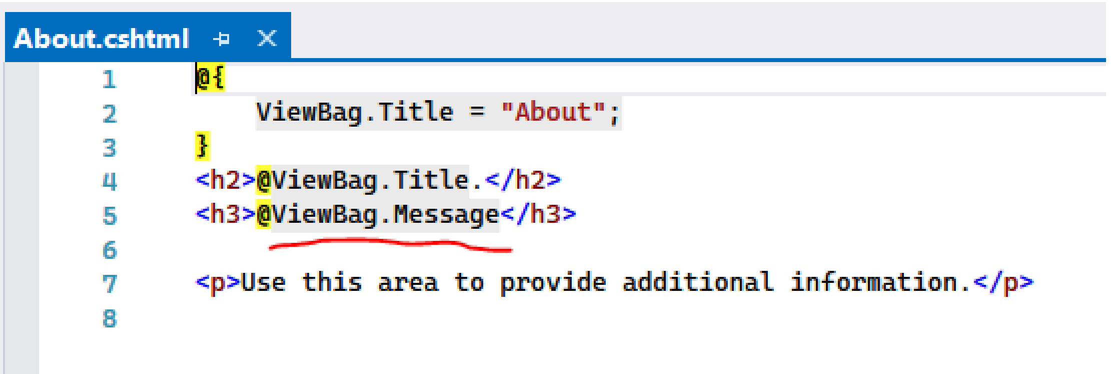
```
•   using System.Web.Mvc;

•   namespace BasicMVCProject.Controllers
•   {
•       public class HomeController : Controller
•       {
•           public ActionResult Index()
•           {
•               return View();
•           }

•           public ActionResult About(string id)
•           {
•               ViewBag.Message = "Your application description page. You entered the ID " + id;

•               return View();
•           }

•           public ActionResult Contact()
•           {
•               ViewBag.Message = "Your contact page.";

•               return View();
•           }
•       }
•   }
```

ViewBag

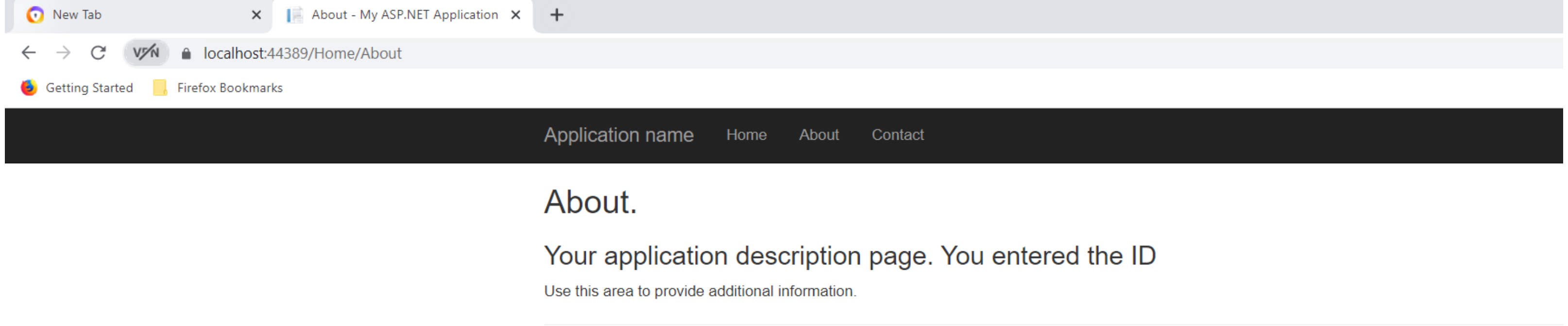
- ViewBag is a dynamic object.
- It is one way of passing data to a view.
- ViewBag is not strongly typed; i.e. it can contain any random data



```
using System.Web.Mvc;

namespace BasicMVCProject.Controllers
{
    0 references
    public class HomeController : Controller
    {
        0 references
        public ActionResult Index()
        {
            return View();
        }

        0 references
        public ActionResult About(string id)
        {
            ViewBag.Message = "Your application description page. You entered the ID " + id;

            return View();
        }

        0 references
        public ActionResult Contact()
        {
            ViewBag.Message = "Your contact page.";

            return View();
        }
    }
}
```



```
@{
    ViewBag.Title = "About";
}
<h2>@ViewBag.Title.</h2>
<h3>@ViewBag.Message</h3>

<p>Use this area to provide additional information.</p>
```

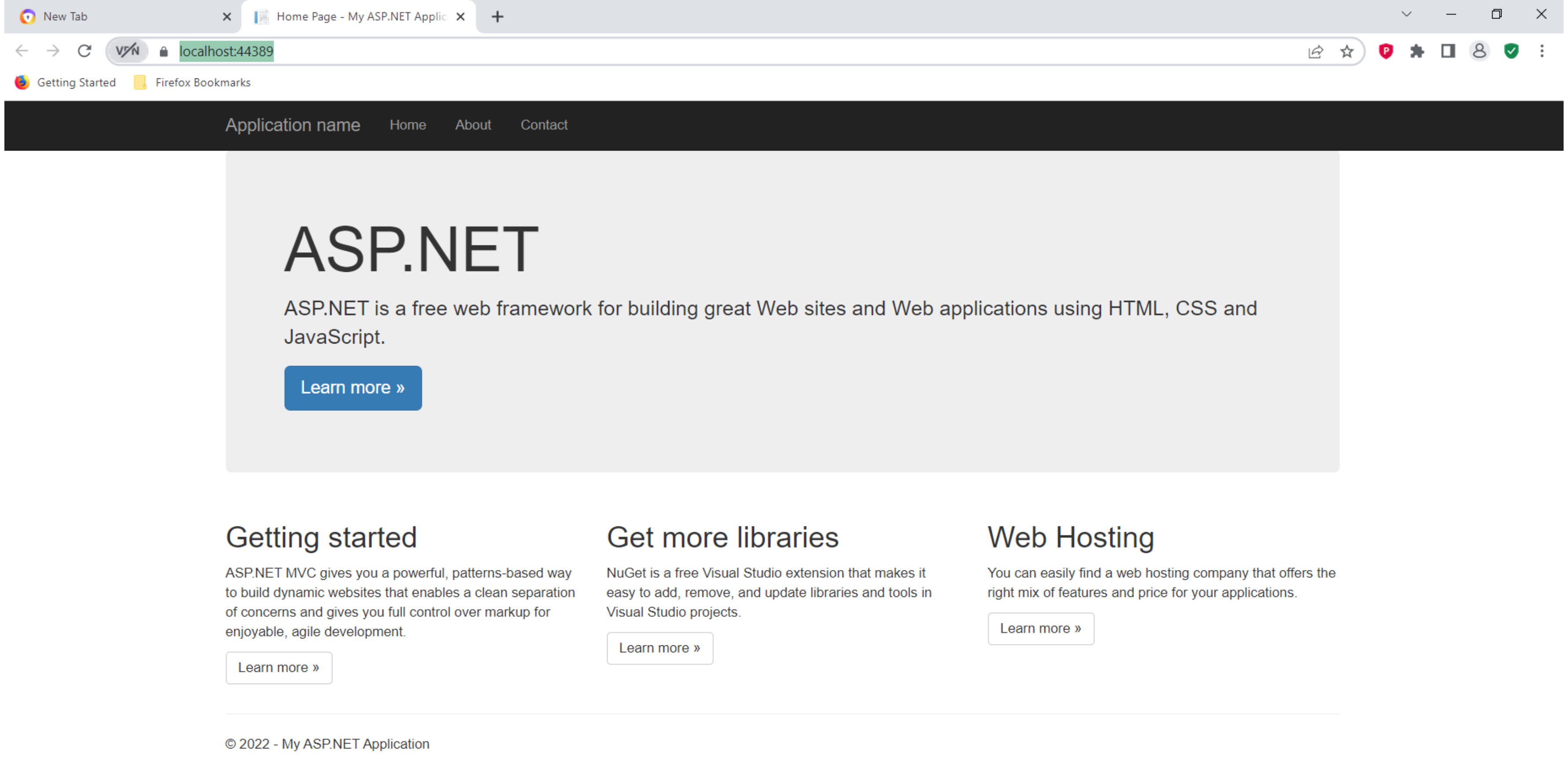


About.

Your application description page. You entered the ID

Use this area to provide additional information.

Home Page



ASP.NET

ASP.NET is a free web framework for building great Web sites and Web applications using HTML, CSS and JavaScript.

Learn more »

Getting started

ASP.NET MVC gives you a powerful, patterns-based way to build dynamic websites that enables a clean separation of concerns and gives you full control over markup for enjoyable, agile development.

Learn more »

Get more libraries

NuGet is a free Visual Studio extension that makes it easy to add, remove, and update libraries and tools in Visual Studio projects.

Learn more »

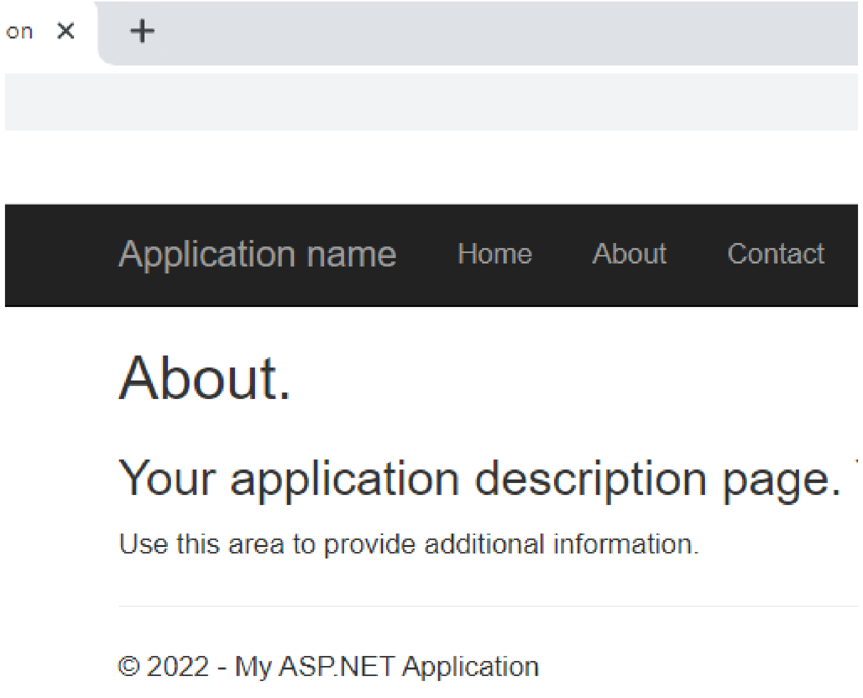
Web Hosting

You can easily find a web hosting company that offers the right mix of features and price for your applications.

Learn more »

© 2022 - My ASP.NET Application

Layout Page

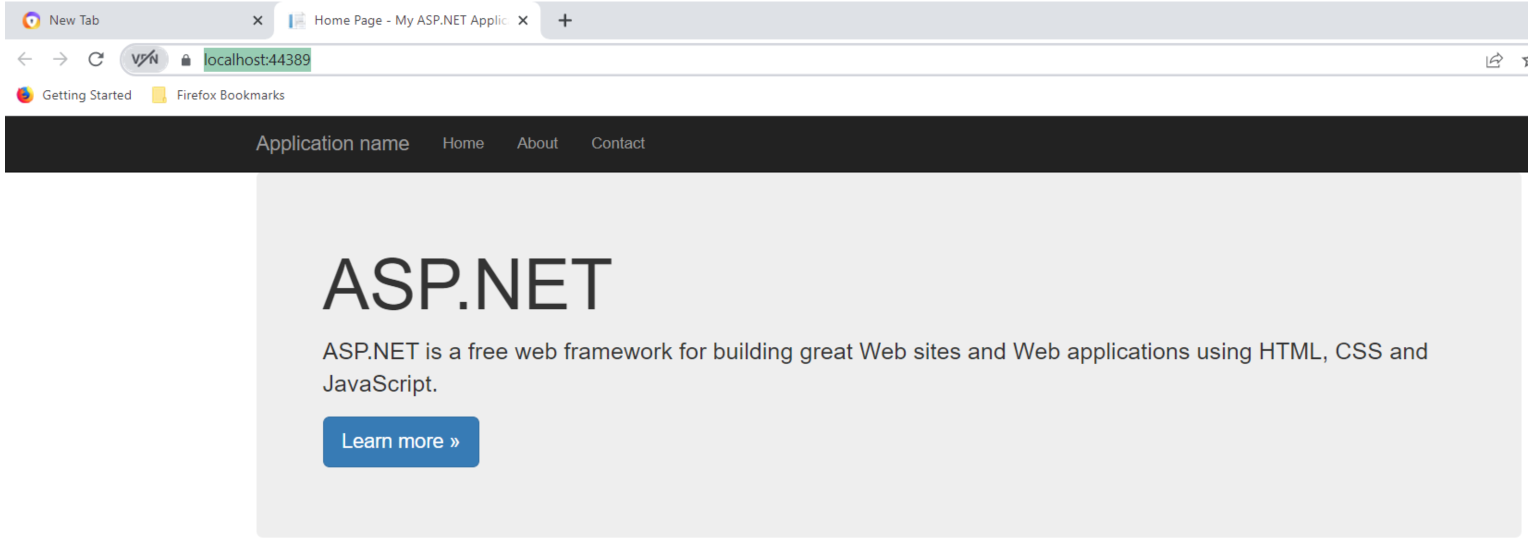


About.

Your application description page.

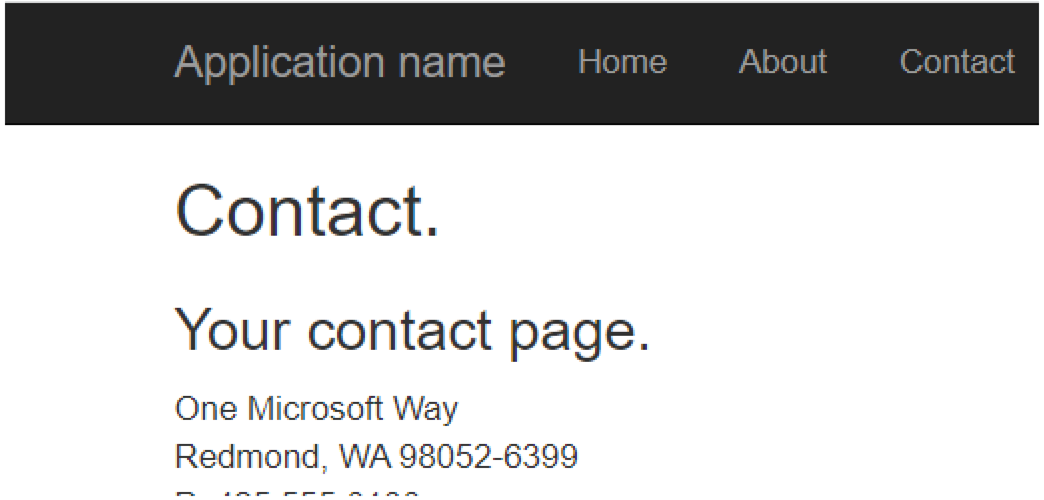
Use this area to provide additional information.

© 2022 - My ASP.NET Application



ASP.NET

ASP.NET is a free web framework for building great Web sites and Web applications using HTML, CSS and JavaScript.



Contact.

Your contact page.

One Microsoft Way
Redmond, WA 98052-6399

The purpose of Layout Page

- You have noticed that when we navigate to different pages, the web site shows the same heading and navigation menu. This is by using a layout page. The layout page us contained in the file Views\Shared_Layout.cshtml as follows:
- It contains HTML elements containing the site navigation.
- The RenderBody() Code in the file is responsible for displaying the content of the view being requested.
- The website knows to use the Views\Shared_Layout.cshtml file as the main layout page because of the contents of the _ViewStart.cshtml, which specifies the layout page to use.

Views\Shared_Layout.cshtml

```
<!DOCTYPE html>
<html>
<head>
    <meta charset="utf-8" />
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <title>@ViewBag.Title - My ASP.NET Application</title>
    @Styles.Render("~/Content/css")
    @Scripts.Render("~/bundles/modernizr")
</head>
<body>
    <div class="navbar navbar-inverse navbar-fixed-top">
        <div class="container">
            <div class="navbar-header">
                <button type="button" class="navbar-toggle" data-toggle="collapse" data-target=".navbar-collapse" title="more options">
                    <span class="icon-bar"></span>
                    <span class="icon-bar"></span>
                    <span class="icon-bar"></span>
                </button>
                @Html.ActionLink("Application name", "Index", "Home", new { area = "" }, new { @class = "navbar-brand" })
            </div>
            <div class="navbar-collapse collapse">
                <ul class="nav navbar-nav">
                    <li>@Html.ActionLink("Home", "Index", "Home")</li>
                    <li>@Html.ActionLink("About", "About", "Home")</li>
                    <li>@Html.ActionLink("Contact", "Contact", "Home")</li>
                </ul>
            </div>
        </div>
    </div>
    <div class="container body-content">
            @RenderBody()
        <hr />
        <footer>
            <p>&copy; @DateTime.Now.Year - My ASP.NET Application</p>
        </footer>
    </div>

    @Scripts.Render("~/bundles/jquery")
    @Scripts.Render("~/bundles/bootstrap")
    @RenderSection("scripts", required: false)
</body>
</html>
```

Views_ViewStart.cshtml

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

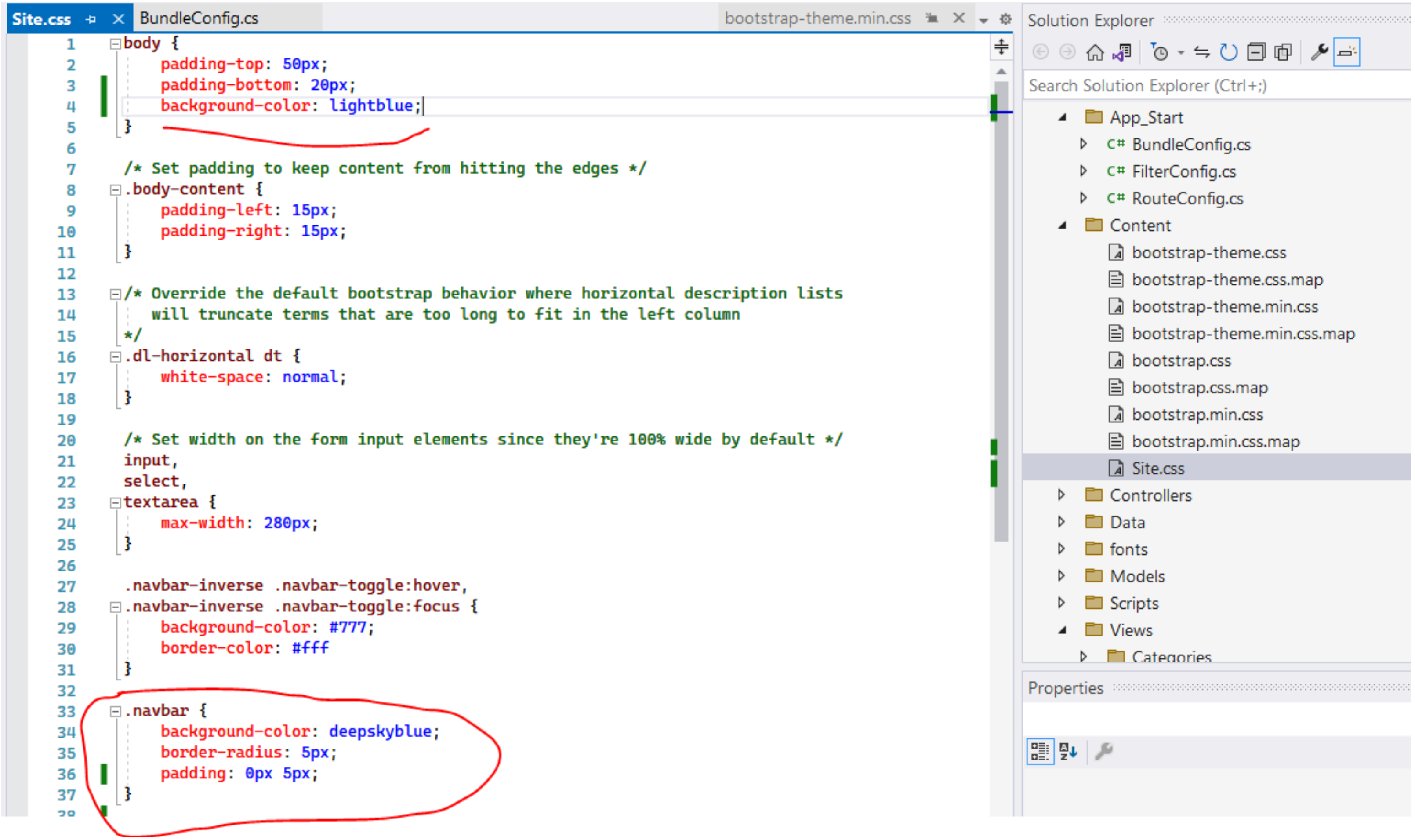
Razor Syntax (C#)

- Add code to a page using the @ character
- Enclose code blocks in braces @{ ... }
- Code statements end with a semicolon inside a block;
- Variables are declared with the var keyword, or the datatype (int, string, etc.)
- Use variables to store values
- Strings are enclosed with double quotation marks
- Code is case sensitive
- C# files have the extension .cshtml

Bootstrap

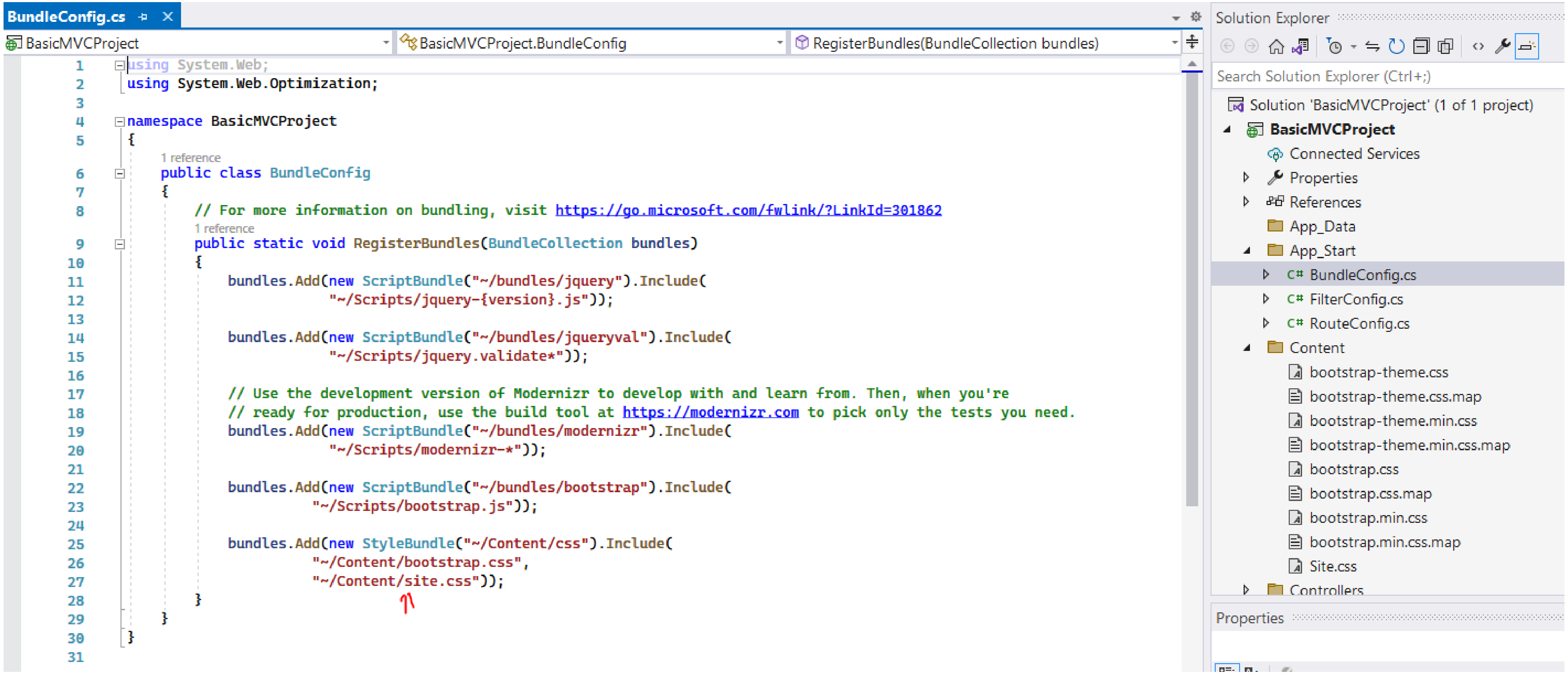
- HTML, CSS, and JavaScript framework
- For developing responsive, mobile-first websites
- Contains HTML, CSS and JavaScript-based design templates for
  - Typography
  - Forms
  - Buttons
  - Navigation
  - Other interface components.

Content: Site.css



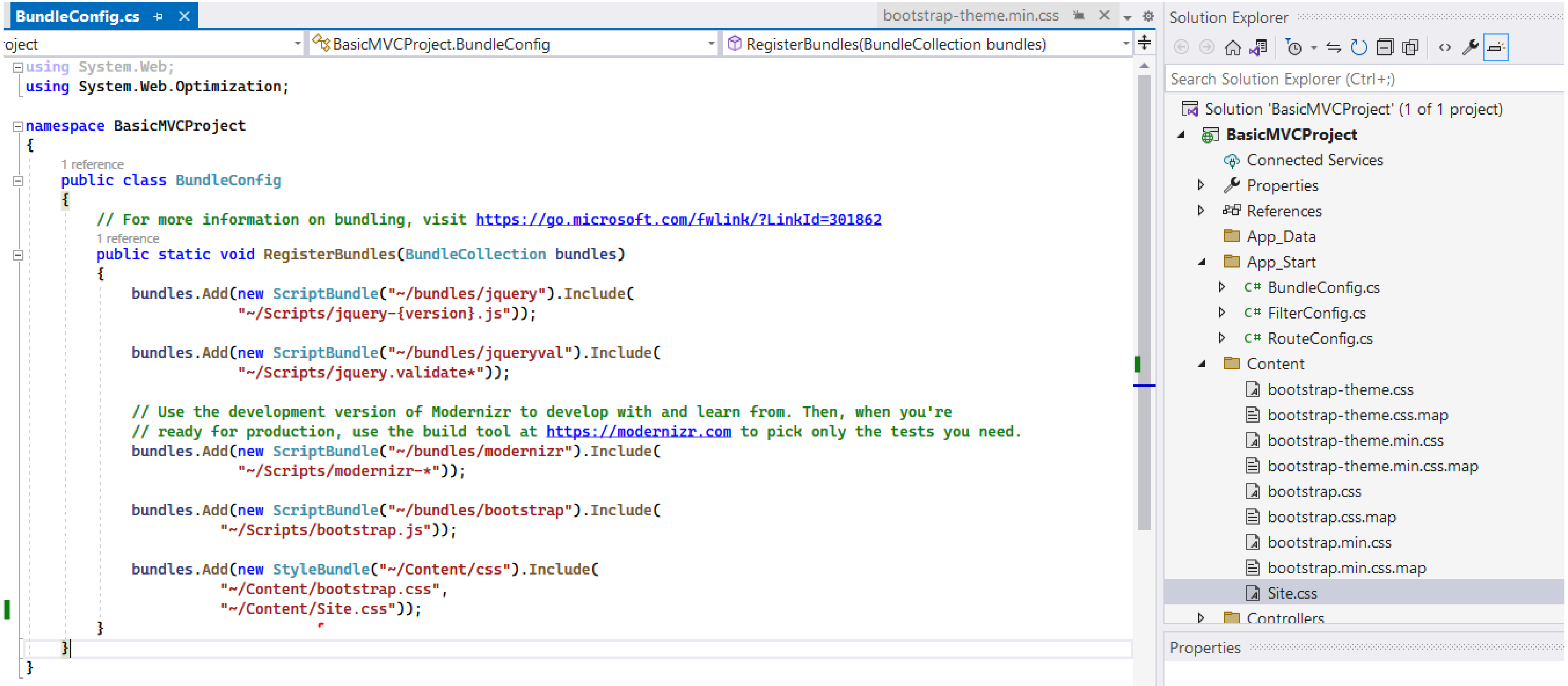
```css
body {
    padding-top: 50px;
    padding-bottom: 20px;
    background-color: lightblue;
}

/* Set padding to keep content from hitting the edges */
.body-content {
    padding-left: 15px;
    padding-right: 15px;
}

/* Override the default bootstrap behavior where horizontal description lists
   will truncate terms that are too long to fit in the left column
*/
.dl-horizontal dt {
    white-space: normal;
}

/* Set width on the form input elements since they're 100% wide by default */
input,
select,
textarea {
    max-width: 280px;
}

.navbar-inverse .navbar-toggle:hover,
.navbar-inverse .navbar-toggle:focus {
    background-color: #777;
    border-color: #fff
}

.navbar {
    background-color: deepskyblue;
    border-radius: 5px;
    padding: 0px 5px;
}
```

BundleConfig: default

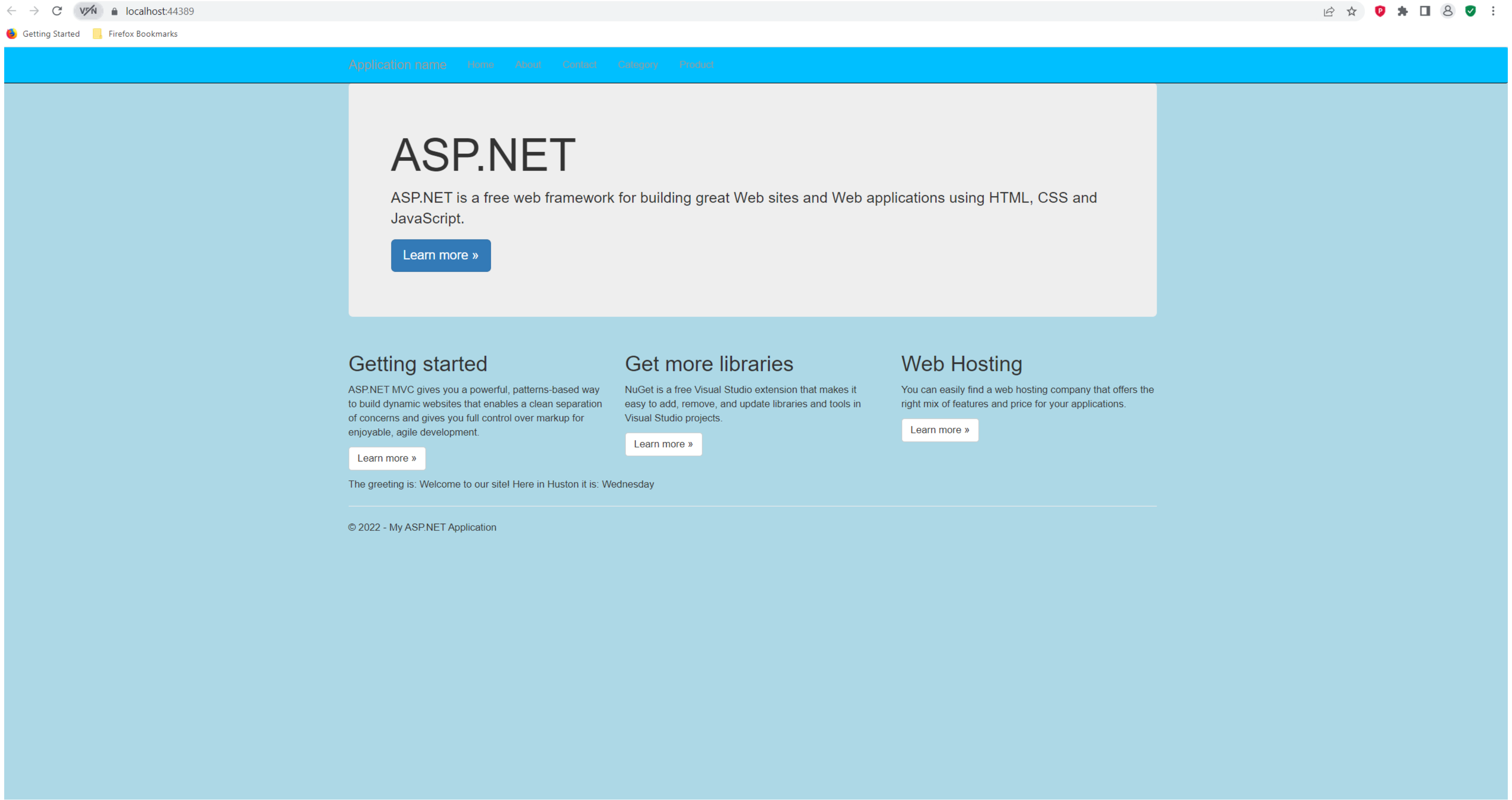


```
using System.Web;
using System.Web.Optimization;

namespace BasicMVCProject
{
    1 reference
    public class BundleConfig
    {
        // For more information on bundling, visit https://go.microsoft.com/fwlink/?LinkId=301862
        1 reference
        public static void RegisterBundles(BundleCollection bundles)
        {
            bundles.Add(new ScriptBundle("~/bundles/jquery").Include(
                        "~/Scripts/jquery-{version}.js"));

            bundles.Add(new ScriptBundle("~/bundles/jqueryval").Include(
                        "~/Scripts/jquery.validate*"));

            // Use the development version of Modernizr to develop with and learn from. Then, when you're
            // ready for production, use the build tool at https://modernizr.com to pick only the tests you need.
            bundles.Add(new ScriptBundle("~/bundles/modernizr").Include(
                        "~/Scripts/modernizr-*"));

            bundles.Add(new ScriptBundle("~/bundles/bootstrap").Include(
                      "~/Scripts/bootstrap.js"));

            bundles.Add(new StyleBundle("~/Content/css").Include(
                      "~/Content/bootstrap.css",
                      "~/Content/site.css"));
        }
    }
}
```

BundleConfig: updated



```
using System.Web;
using System.Web.Optimization;

namespace BasicMVCProject
{
    1 reference
    public class BundleConfig
    {
        // For more information on bundling, visit https://go.microsoft.com/fwlink/?LinkId=301862
        1 reference
        public static void RegisterBundles(BundleCollection bundles)
        {
            bundles.Add(new ScriptBundle("~/bundles/jquery").Include(
                        "~/Scripts/jquery-{version}.js"));

            bundles.Add(new ScriptBundle("~/bundles/jqueryval").Include(
                        "~/Scripts/jquery.validate*"));

            // Use the development version of Modernizr to develop with and learn from. Then, when you're
            // ready for production, use the build tool at https://modernizr.com to pick only the tests you need.
            bundles.Add(new ScriptBundle("~/bundles/modernizr").Include(
                        "~/Scripts/modernizr-*"));

            bundles.Add(new ScriptBundle("~/bundles/bootstrap").Include(
                      "~/Scripts/bootstrap.js"));

            bundles.Add(new StyleBundle("~/Content/css").Include(
                      "~/Content/bootstrap.css",
                      "~/Content/Site.css"));
        }
    }
}
```



ASP.NET

ASP.NET is a free web framework for building great Web sites and Web applications using HTML, CSS and JavaScript.

Learn more »

Getting started

ASP.NET MVC gives you a powerful, patterns-based way to build dynamic websites that enables a clean separation of concerns and gives you full control over markup for enjoyable, agile development.

Learn more »

Get more libraries

NuGet is a free Visual Studio extension that makes it easy to add, remove, and update libraries and tools in Visual Studio projects.

Learn more »

Web Hosting

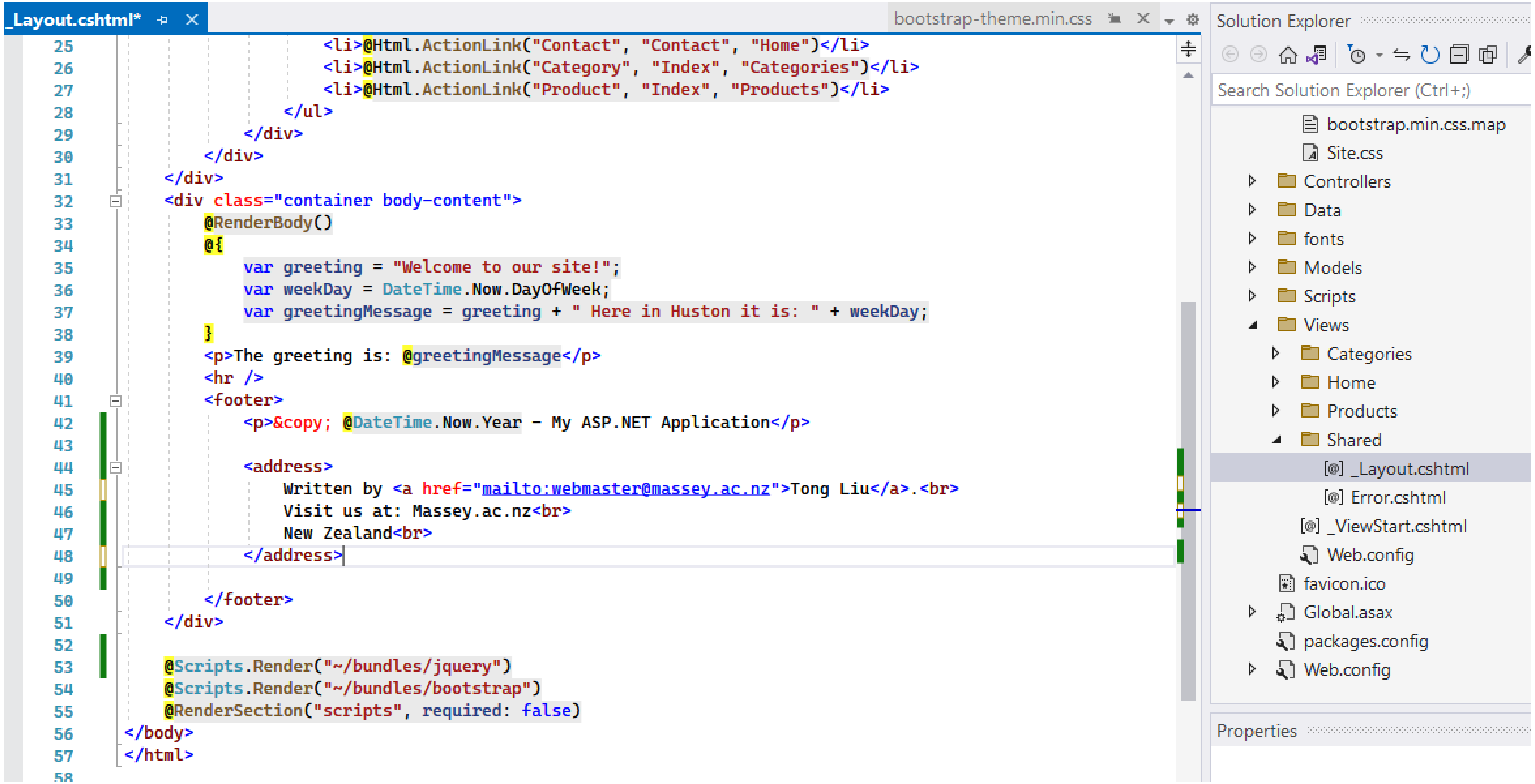
You can easily find a web hosting company that offers the right mix of features and price for your applications.

Learn more »

The greeting is: Welcome to our site! Here in Huston it is: Wednesday

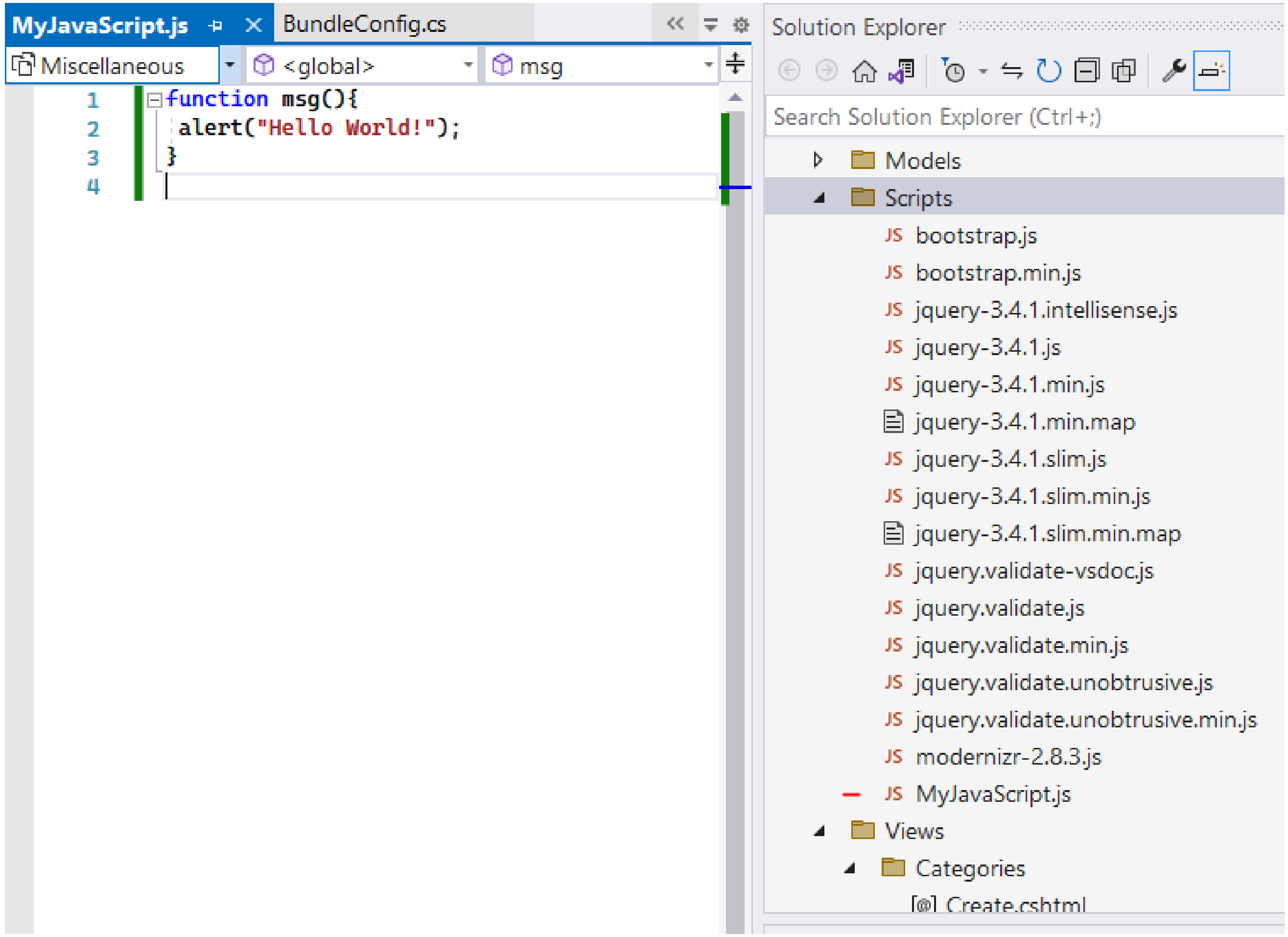
© 2022 - My ASP.NET Application

Add Email link



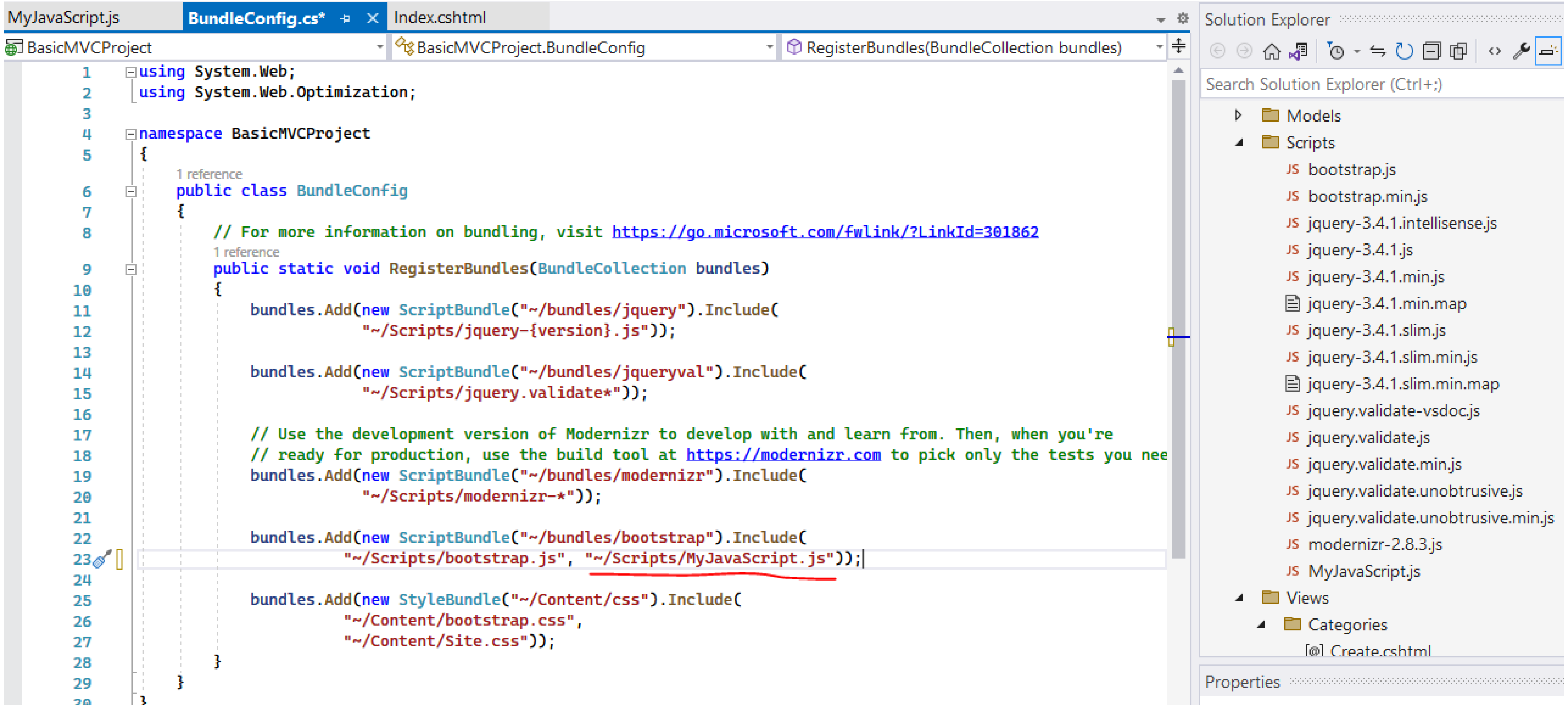
```
                    <li>@Html.ActionLink("Contact", "Contact", "Home")</li>
                    <li>@Html.ActionLink("Category", "Index", "Categories")</li>
                    <li>@Html.ActionLink("Product", "Index", "Products")</li>
                </ul>
            </div>
        </div>
    </div>
    <div class="container body-content">
        @RenderBody()
        @{
            var greeting = "Welcome to our site!";
            var weekDay = DateTime.Now.DayOfWeek;
            var greetingMessage = greeting + " Here in Huston it is: " + weekDay;
        }
        <p>The greeting is: @greetingMessage</p>
        <hr />
        <footer>
            <p>&copy; @DateTime.Now.Year - My ASP.NET Application</p>

            <address>
                Written by <a href="mailto:webmaster@massey.ac.nz">Tong Liu</a>.<br>
                Visit us at: Massey.ac.nz<br>
                New Zealand<br>
            </address>

        </footer>
    </div>

    @Scripts.Render("~/bundles/jquery")
    @Scripts.Render("~/bundles/bootstrap")
    @RenderSection("scripts", required: false)
</body>
</html>
```

JavaScript Files

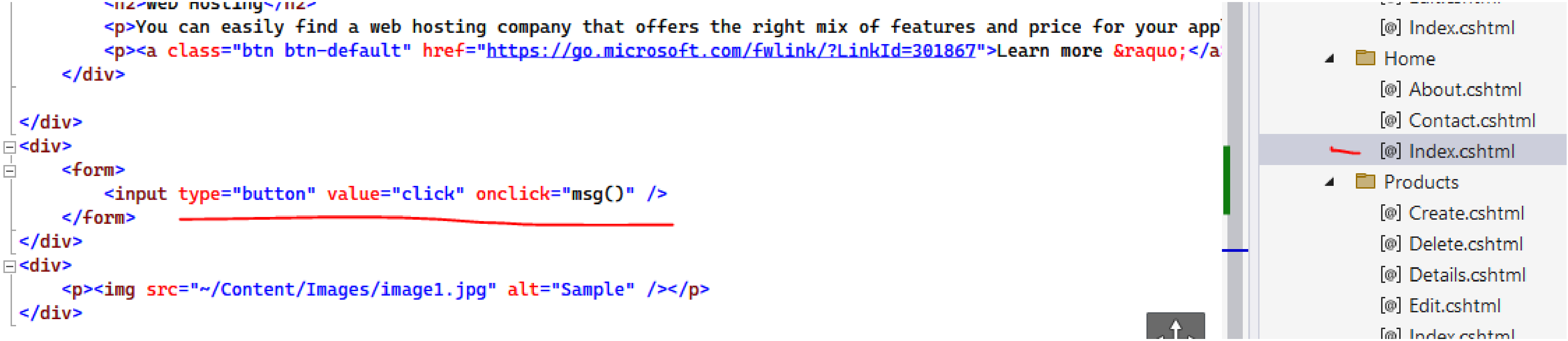


```
function msg(){
 alert("Hello World!");
}

```

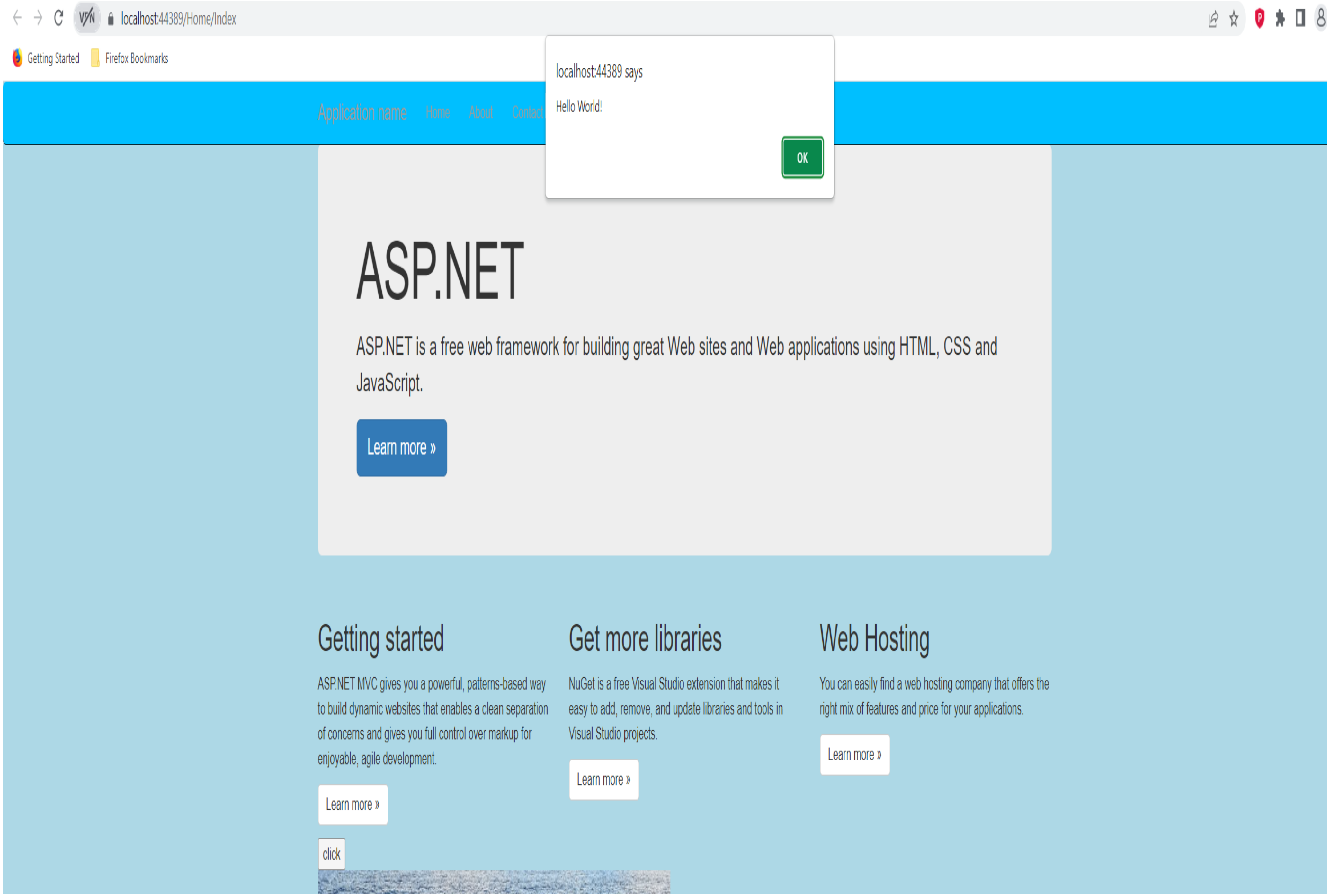
Add JavaScript Files



```
using System.Web;
using System.Web.Optimization;

namespace BasicMVCProject
{
    1 reference
    public class BundleConfig
    {
        // For more information on bundling, visit https://go.microsoft.com/fwlink/?LinkId=301862
        1 reference
        public static void RegisterBundles(BundleCollection bundles)
        {
            bundles.Add(new ScriptBundle("~/bundles/jquery").Include(
                        "~/Scripts/jquery-{version}.js"));

            bundles.Add(new ScriptBundle("~/bundles/jqueryval").Include(
                        "~/Scripts/jquery.validate*"));

            // Use the development version of Modernizr to develop with and learn from. Then, when you're
            // ready for production, use the build tool at https://modernizr.com to pick only the tests you nee
            bundles.Add(new ScriptBundle("~/bundles/modernizr").Include(
                        "~/Scripts/modernizr-*"));

            bundles.Add(new ScriptBundle("~/bundles/bootstrap").Include(
                      "~/Scripts/bootstrap.js", "~/Scripts/MyJavaScript.js"));

            bundles.Add(new StyleBundle("~/Content/css").Include(
                      "~/Content/bootstrap.css",
                      "~/Content/Site.css"));
        }
    }
}
```



```
        <h2>Web Hosting</h2>
        <p>You can easily find a web hosting company that offers the right mix of features and price for your app
        <p><a class="btn btn-default" href="https://go.microsoft.com/fwlink/?LinkId=301867">Learn more &raquo;</a
    </div>

</div>
<div>
    <form>
        <input type="button" value="click" onclick="msg()" />
    </form>
</div>
<div>
    <p><img src="~/Content/Images/image1.jpg" alt="Sample" /></p>
</div>
```



localhost:44389 says

Hello World!

ASP.NET

ASP.NET is a free web framework for building great Web sites and Web applications using HTML, CSS and JavaScript.

Getting started

ASP.NET MVC gives you a powerful, patterns-based way to build dynamic websites that enables a clean separation of concerns and gives you full control over markup for enjoyable, agile development.

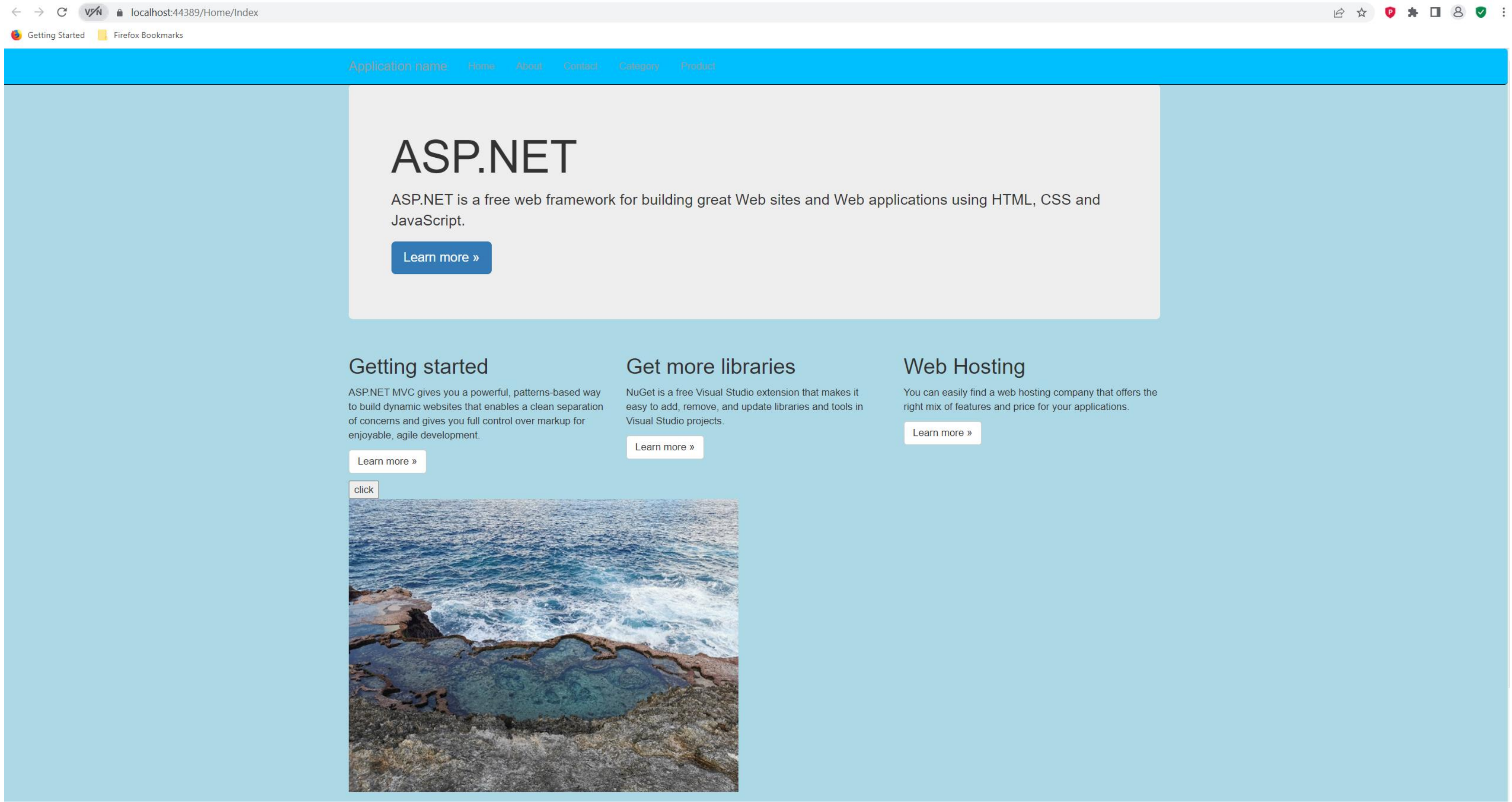
Get more libraries

NuGet is a free Visual Studio extension that makes it easy to add, remove, and update libraries and tools in Visual Studio projects.

Web Hosting

You can easily find a web hosting company that offers the right mix of features and price for your applications.

images



ASP.NET

ASP.NET is a free web framework for building great Web sites and Web applications using HTML, CSS and JavaScript.

Getting started

ASP.NET MVC gives you a powerful, patterns-based way to build dynamic websites that enables a clean separation of concerns and gives you full control over markup for enjoyable, agile development.

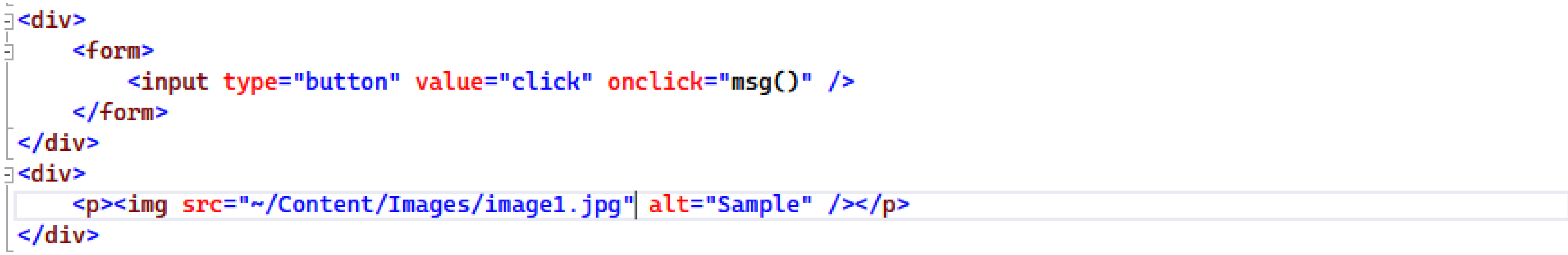
Get more libraries

NuGet is a free Visual Studio extension that makes it easy to add, remove, and update libraries and tools in Visual Studio projects.

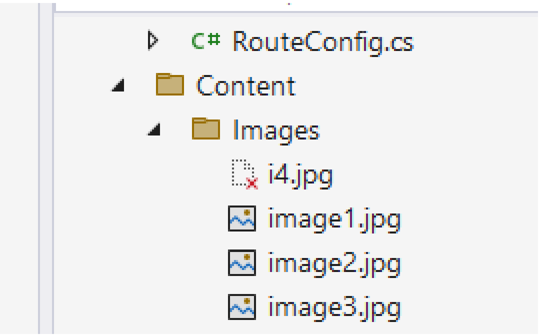
Web Hosting

You can easily find a web hosting company that offers the right mix of features and price for your applications.

images

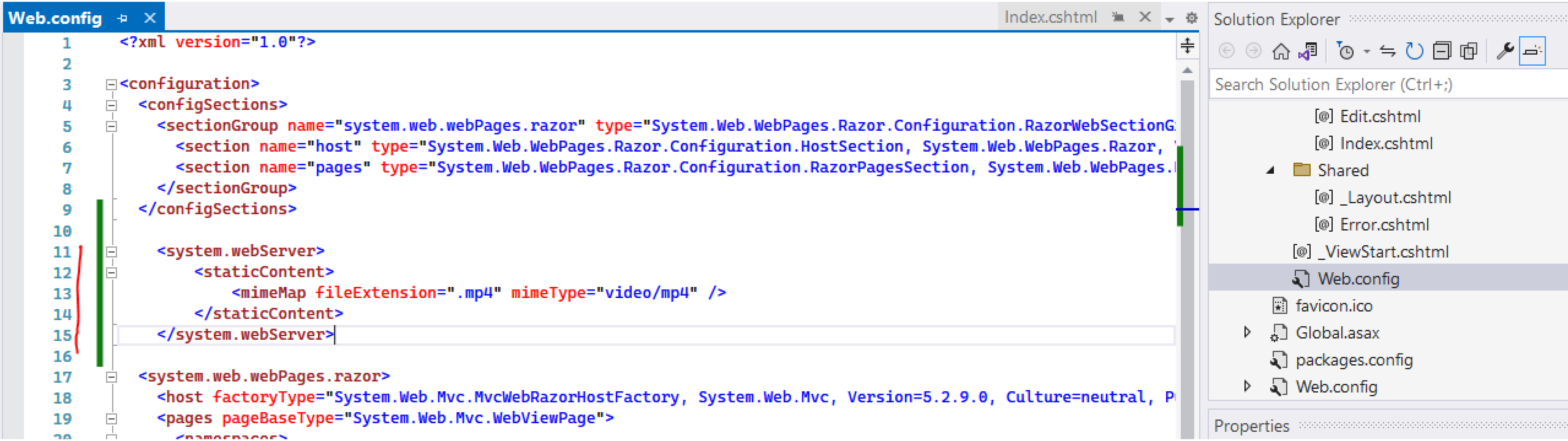


```
<div>
    <form>
        <input type="button" value="click" onclick="msg()" />
    </form>
</div>
<div>
    <p><img src="~/Content/Images/image1.jpg" alt="Sample" /></p>
</div>
```



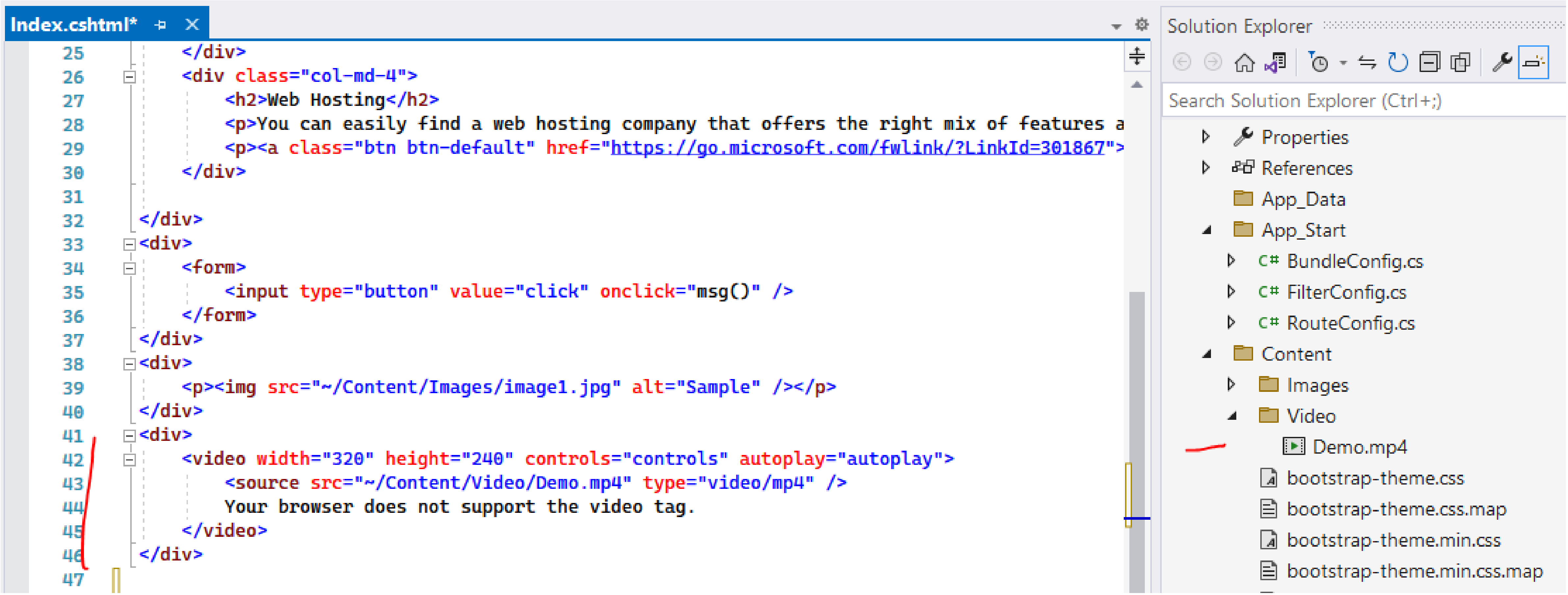
```
RouteConfig.cs
Content
  Images
    i4.jpg
    image1.jpg
    image2.jpg
    image3.jpg
```

Web.config:Video



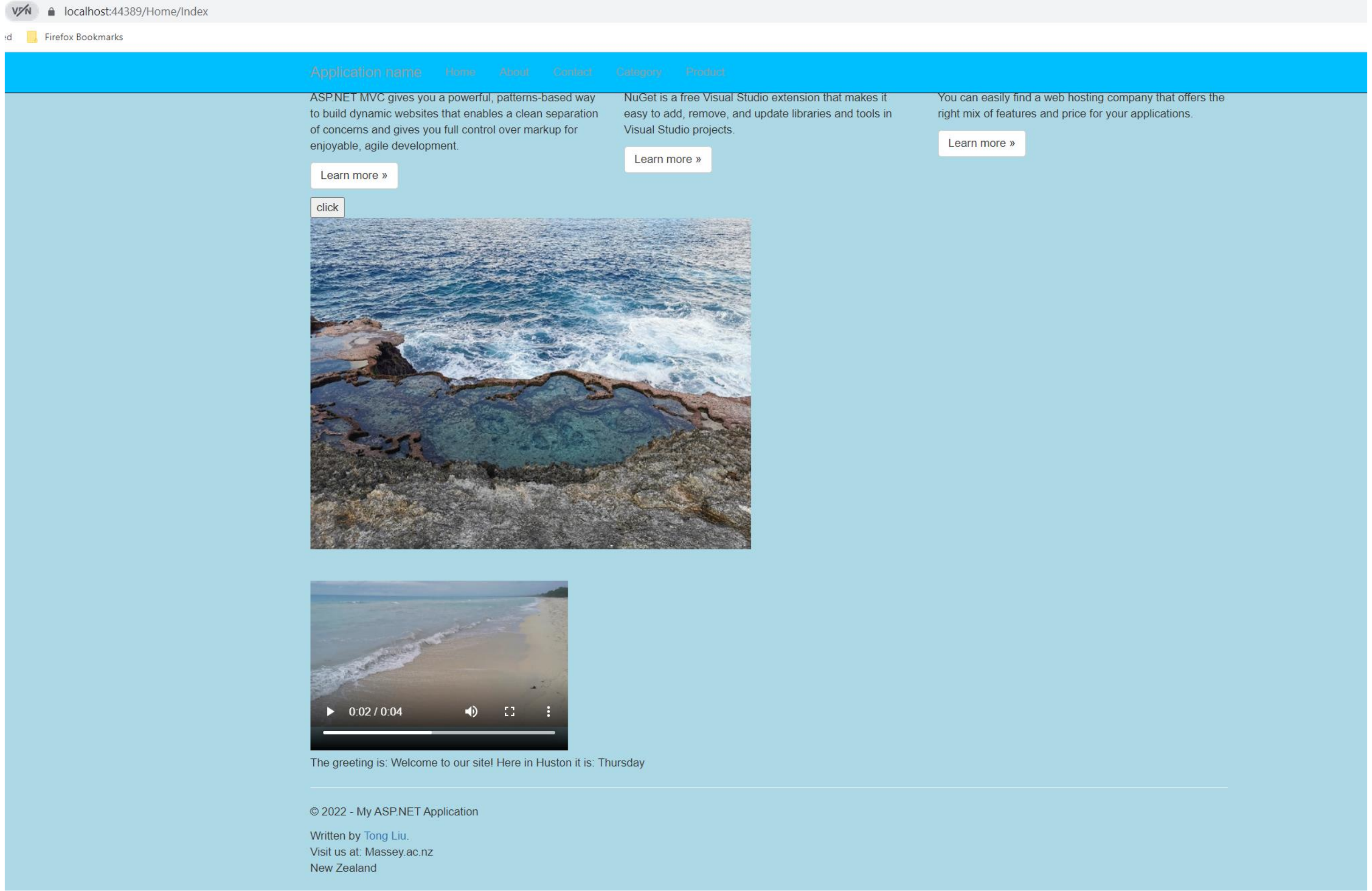
```
<?xml version="1.0"?>

<configuration>
  <configSections>
    <sectionGroup name="system.web.webPages.razor" type="System.Web.WebPages.Razor.Configuration.RazorWebSectionG
      <section name="host" type="System.Web.WebPages.Razor.Configuration.HostSection, System.Web.WebPages.Razor, '
      <section name="pages" type="System.Web.WebPages.Razor.Configuration.RazorPagesSection, System.Web.WebPages.I
    </sectionGroup>
  </configSections>

    <system.webServer>
        <staticContent>
            <mimeMap fileExtension=".mp4" mimeType="video/mp4" />
        </staticContent>
    </system.webServer>

  <system.web.webPages.razor>
    <host factoryType="System.Web.Mvc.MvcWebRazorHostFactory, System.Web.Mvc, Version=5.2.9.0, Culture=neutral, P
    <pages pageBaseType="System.Web.Mvc.WebViewPage">
      <namespaces>
```

Home/Index.cshtml



```
    </div>
    <div class="col-md-4">
        <h2>Web Hosting</h2>
        <p>You can easily find a web hosting company that offers the right mix of features a
        <p><a class="btn btn-default" href="https://go.microsoft.com/fwlink/?LinkId=301867">
    </div>

</div>
<div>
    <form>
        <input type="button" value="click" onclick="msg()" />
    </form>
</div>
<div>
    <p><img src="~/Content/Images/image1.jpg" alt="Sample" /></p>
</div>
<div>
    <video width="320" height="240" controls="controls" autoplay="autoplay">
        <source src="~/Content/Video/Demo.mp4" type="video/mp4" />
        Your browser does not support the video tag.
    </video>
</div>
```

Video



ASP.NET MVC gives you a powerful, patterns-based way to build dynamic websites that enables a clean separation of concerns and gives you full control over markup for enjoyable, agile development.

NuGet is a free Visual Studio extension that makes it easy to add, remove, and update libraries and tools in Visual Studio projects.

You can easily find a web hosting company that offers the right mix of features and price for your applications.

The greeting is: Welcome to our site! Here in Huston it is: Thursday

© 2022 - My ASP.NET Application

Written by Tong Liu.
Visit us at: Massey.ac.nz
New Zealand

Summary

- ASP.NET MVC
- Routing
- Convention Over Configuration
- Layout