

Version: 9.0

Case Study: 1

Olympic Marathon

Background

You are developing an ASP.NET MVC application in Visual Studio 2012 that will be used by Olympic marathon runners to log data about training runs.

Business Requirements

The application stores date, distance, and duration information about a user's training runs. The user can view, insert, edit, and delete records.

The application must be optimized for accessibility.

All times must be displayed in the user's local time.

Technical Requirements

Data Access:

Database access is handled by a public class named `RunnerLog.DataAccess.RunnerLogDb`.

All data retrieval must be done by HTTP GET and all data updates must be done by HTTP POST.

Layout:

All pages in the application use a master layout file named `\Views\Shared_Layout.cshtml`.

Models:

The application uses the `\Models\LogModel.cs` model.

Views:

All views in the application use the Razor view engine.

Four views located in `\Views\RunLog` are named:

- `_CalculatePace.cshtml`
- `EditLog.cshtml`
- `GetLog.cshtml`
- `InsertLog.cshtml`

The application also contains a `\Views\Home\Index.cshtml` view.

Controllers:

The application contains a `\Controllers\RunLogController.cs` controller.

Images:

A `stopwatch.png` image is located in the `\Images` folder.

Videos:

A map of a runner's path is available when a user views a run log. The map is implemented as an Adobe Flash application and video. The browser should display the video natively if possible, using H264, Ogg, or WebM formats, in that order. If the video cannot be displayed, then the Flash application should be used.

Security:

You have the following security requirements:

- The application is configured to use forms authentication.
- Users must be logged on to insert runner data.
- Users must be members of the Admin role to edit or delete runner data.
- There are no security requirements for viewing runner data.
- You need to protect the application against cross-site request forgery.
- Passwords are hashed by using the SHA1 algorithm.

RunnerLog.Providers.RunLogRoleProvider.cs contains a custom role provider.

Relevant portions of the application files follow. (Line numbers are included for reference only.)

Application Structure

Controllers\RunLogController.cs

```

RC01 public class RunLogController : Controller
RC02 {
RC03     public ActionResult GetLog()
RC04     {
RC05         List<LogModel> log = RunnerLogDb.GetLogsFromDatabase();
RC06         return View(log);
RC07     }
RC08
RC09     public ActionResult InsertLog()
RC10     {
RC11         LogModel log = new LogModel();
RC12         log.RunDate = DateTime.Now;
RC13         return View(log);
RC14     }
RC15
RC16     [HttpPost]
RC17     public ActionResult InsertLog(LogModel log)
RC18     {
RC19         RunnerLogDb.InsertLog(log);
RC20         return RedirectToAction("GetLog");
RC21     }
RC22
RC23     public ActionResult DeleteLog(int id)
RC24     {
RC25         RunnerLogDb.DeleteLog(id);
RC26         return RedirectToAction("GetLog");
RC27     }
RC28
RC29     public ActionResult EditLog(int id)
RC30     {
RC31         LogModel log = RunnerLogDb.GetRunnerLog(id);
RC32         return View(log);
RC33     }
RC34 }

```

Models\LogModel.cs

```
LM01 public class LogModel
LM02 {
LM03     [Required]
LM04     public int Id { get; set; }
LM05
LM06     [Required]
LM07     public DateTime RunDate { get; set; }
LM08
LM09     [Required]
LM10     [Range (0.01, 1000.00)]
LM11     public double Distance { get; set; }
LM12
LM13     [Required]
LM14     public TimeSpan Time { get; set; }
LM15
LM16     public string ShortDate
LM17     {
LM18         get
LM19         {
LM20             return RunDate.ToLocalTime().ToShortDateString();
LM21         }
LM22     }
LM23 }
```

Views\RunLog_CalculatePace.cshtml

```
CP01 @model RunnerLog.Models.LogModel
CP02 @(Convert.ToInt32(Model.Time.TotalMinutes / Model.Distance)) Min
CP03 @(Convert.ToInt32(Model.Time.TotalSeconds % 60 / Model.Distance)) Seconds
```

Views\RunLog\EditLog.cshtml

```
EL01 @model RunnerLog.Models.LogModel
EL02 <h2>Edit Log Item</h2>
EL03 <script src="@Url.Content("~/Scripts/jquery.validate.min.js")"></script>
EL04 <script src="@Url.Content("~/Scripts/jquery.validate.unobtrusive.min.js")"></
script>
EL05 @using (Html.BeginForm()) {
EL06     @Html.AntiForgeryToken()
EL07     @Html.ValidationSummary(true)
EL08     <fieldset>
EL09         <legend>LogModel</legend>
EL10         <h3>
EL11             Log Id: @Model.Id
EL12         </h3>
EL13         <div>
EL14             @Html.LabelFor(model => model.Distance)
EL15         </div>
EL16         <div>
EL17             @Html.EditorFor(model => model.Distance)
EL18             @Html.ValidationMessageFor(model => model.Distance)
EL19         </div>
EL20         <div>
EL21             @Html.LabelFor(model => model.Time)
EL22         </div>
EL23         <div>
EL24             @Html.EditorFor(model => model.Time)
EL25             @Html.ValidationMessageFor(model => model.Time)
EL26         </div>
EL27         <p>
EL28             <input type="submit" value="Save" />
EL29         </p>
EL30     </fieldset>
EL31 }
```

Views\RunLog\GetLog.cshtml

```
GL01 @model List<RunnerLog.Models.LogModel>
GL02 <h2>View Runs </h2>
GL03 <table>
GL04   <tr>
GL05     <th>Id </th>
GL06     <th>Date </th>
GL07     <th>Distance </th>
GL08     <th>Duration </th>
GL09     <th>Avg Mile Pace </th>
GL10   </tr>
GL11   @foreach (RunnerLog.Models.LogModel log in Model)
GL12   {
GL13     <tr>
GL14       <td>
GL15         @Html.DisplayFor(model => log.Id)
GL16       </td>
GL17       <td>
GL18
GL19     </td>
GL20     <td>
GL21       @Html.DisplayFor(model => log.Distance)
GL22     </td>
GL23     <td>
GL24       @Html.DisplayFor(model => log.Time)
GL25     </td>
GL26     <td>
GL27
GL28   </td>
GL29   <td>
GL30     @Html.ActionLink("Edit", "EditLog", new { id = log.Id })
GL31   </td>
GL32   <td>
GL33     @Html.ActionLink("Delete", "DeleteLog", new { id = log.Id })
GL34   </td>
GL35   </tr>
GL36   }
GL37 </table>
```

Views\RunLog\InsertLog.cshtml

```
IL01 @model RunnerLog.Models.LogModel
IL02 <script src="@Url.Content("~/Scripts/jquery.validate.min.js")"></script>
IL03 <script src="@Url.Content("~/Scripts/jquery.validate.unobtrusive.min.js")"></
script>
IL04 @using (Html.BeginForm())
IL05 {
IL06     @Html.ValidationSummary(true)
IL07     <fieldset>
IL08         <legend>LogModel</legend>
IL09
IL10         <div>
IL11             @Html.LabelFor(model => model.RunDate)
IL12         </div>
IL13         <div>
IL14             @Html.EditorFor(model => model.RunDate)
IL15             @Html.ValidationMessageFor(model => model.RunDate)
IL16         </div>
IL17         <div>
IL18             @Html.LabelFor(model => model.Distance)
IL19         </div>
IL20         <div>
IL21             @Html.EditorFor(model => model.Distance)
IL22             @Html.ValidationMessageFor(model => model.Distance)
IL23         </div>
IL24         <div>
IL25             @Html.LabelFor(model => model.Time) HH:MM:SS
IL26         </div>
IL27         <div>
IL28             @Html.EditorFor(model => model.Time)
IL29             @Html.ValidationMessageFor(model => model.Time)
IL30         </div>
IL31         <p>
IL32             <input type="submit" value="Create" />
IL33         </p>
IL34     </fieldset>
IL35 }
```

Views\Shared_Layout.cshtml

```
L001 <!DOCTYPE html>
L002 <html lang="en">
L003 <head>
L004   ...
L005 </head>
L006 <body>
L007   ...
L008   <footer>
L009
L010     <script type="text/javascript">
L011       var c = document.getElementById('myCanvas');
L012       var ctx = c.getContext('2d');
L013       ctx.font = '30pt Calibri';
L014       ctx.strokeStyle = 'gray';
L015       ctx.lineWidth = 3;
L016       ctx.strokeText('London 2012', 80, 30);
L017     </script>
L018   </footer>
L019 </body>
L020 </html>
```

Question: 1

DRAG DROP

You need to implement the Views\RunLog_CalculatePace.cshtml partial view from Views\Runlog\GetLog.cshtml to display the runner's average mile pace.

How should you implement the view? (To answer, drag the appropriate code segments to the correct location or locations. Each code segment may be used once, more than once, or not at all. You may need to drag the split bar between panes or scroll to view content.)


```

@Html.Partial(
@Html.Action(
    "_CalculatePace.cshtml", log)
    "_CalculatePace", log)
    "_CalculatePace")

```

```

<td>
    @Html.DisplayFor(model => log.Time)
</td>
<td>
</td>
</td>
<td>
    @Html.ActionLink(
        "Delete", "DeleteLog",
        new { id = log.Id })
</td>

```

Answer:

```

@Html.Action(
    "_CalculatePace.cshtml", log)
    "_CalculatePace")

```

```

<td>
    @Html.DisplayFor(model => log.Time)
</td>
<td>
    @Html.Partial(
        "_CalculatePace", log)
</td>
<td>
    @Html.ActionLink(
        "Delete", "DeleteLog",
        new { id = log.Id })
</td>

```

Question: 2

DRAG DROP

You need to implement security according to the business requirements.

How should you modify RunLogController? (To answer, drag the appropriate code segment to the correct location or locations. Each code segment may be used once, more than once, or not at all. You may need to drag the split bar between panes or scroll to view content.)

[Authorize(Roles = "Admin")]

[Authorize]

[Authorize(Users = "Admin")]

[AllowAnonymous]

[Authorize(Users = "*")]

```
public class RunLogController : Controller
{
    [ ]
    public ActionResult GetLog()
    ...

    public ActionResult InsertLog()
    ...

    [ ]
    public ActionResult DeleteLog(int id)

    [ ]

    public ActionResult EditLog(int id)
    ...
}
```

Answer:

<code>[Authorize(Roles = "Admin")]</code>	<code>[Authorize]</code>
<code>[Authorize(Users = "Admin")]</code>	<code>[AllowAnonymous]</code>
<code>[Authorize(Users = "**")]</code>	<code>[Authorize(Roles = "Admin")]</code>

```

public class RunLogController : Controller
{
    public ActionResult GetLog()
    ...

    public ActionResult InsertLog()
    ...

    public ActionResult DeleteLog(int id)
    ...

    public ActionResult EditLog(int id)
    ...
}

```

Question: 3

You need to make the "Distance" header of the table bold in the Views/RunLog/GetLog.cshtml view. Which code segment should you use?

- A. `table>tr{ font-weight: bold; }`
- B. `table>th:last-child{ font-weight: bold; }`
- C. `table>tr>th{ font-weight: bold; }`
- D. `table>tr>th:nth-child (2) { font-weight: bold; }`

Answer: D

Question: 4

You need to extend the edit functionality of RunLogController. Which code segment should you use?

- A. `[HttpGet]`
`[ActionName("EditLog")]`
`[ValidateAntiForgeryToken]`
`public ActionResult EditLog(LogModel log)`
`{`
 `...`
`}`
- B. `[HttpPost]`
`[ActionName("EditLog")]`
`public ActionResult EditLogValidated(LogModel log)`
`{`
 `...`
`}`
- C. `[HttpPost]`
`[ActionName("EditLog")]`
`[ValidateAntiForgeryToken]`
`public ActionResult EditLogValidated(LogModel log)`
`{`
 `...`
`}`
- D. `[HttpPost]`
`[ActionName("EditLog")]`
`[RequireHttps]`
`public ActionResult EditLogValidated(LogModel log)`
`{`
 `...`
`}`

- A. Option A
B. Option B
C. Option C
D. Option D

Answer: C

Question: 5

HOTSPOT

You need to implement the map of the runners' paths.

How should you build the video viewer? (To answer, select the appropriate options in the answer area.)

Work Area

```
<video width="320" height="240">  
  <input type="text" />  
  <input type="text" />  
  <input type="text" />  
  <input type="text" value="" width="320" height="240">  
    <input type="text" value="" name="movie" value="map.swf" />  
    <input type="text" value="" src="map.swf" />  
  </input type="text" />  
</video>
```

`<video width="320" height="240">`

`<` `>`

source src="map.mp4" type="video/mp4"
source src="map.ogv" type="video/ogg"
source src="map.webm" type="video/webm"

`<` `>`

source src="map.mp4" type="video/mp4"
source src="map.ogv" type="video/ogg"
source src="map.webm" type="video/webm"

`<` `>`

source src="map.mp4" type="video/mp4"
source src="map.ogv" type="video/ogg"
source src="map.webm" type="video/webm"

`<` `width="320" height="240">`

embed
object
video
canvas

`<` `name="movie" value="map.swf" />`

object
param
option
embed

`<` `src="map.swf" />`

video
param
embed
source

`</` `>`

embed
object
video
canvas

`</video>`

Answer:

Work Area

```
<video width="320" height="240">
```

```
< >
```

```
source src="map.mp4" type="video/mp4"  
source src="map.ogv" type="video/ogg"  
source src="map.webm" type="video/webm"
```

```
< >
```

```
source src="map.mp4" type="video/mp4"  
source src="map.ogv" type="video/ogg"  
source src="map.webm" type="video/webm"
```

```
< >
```

```
source src="map.mp4" type="video/mp4"  
source src="map.ogv" type="video/ogg"  
source src="map.webm" type="video/webm"
```

```
< width="320" height="240">
```

```
embed  
object  
video  
canvas
```

```
< name="movie" value="map.swf" />
```

```
object  
param  
option  
embed
```

```
< src="map.swf" />
```

```
video  
param  
embed  
source
```

```
</ >
```

```
embed  
object  
video  
canvas
```

```
</video>
```

Question: 6

HOTSPOT

You need to ensure that only valid parameters are passed to the EditLog action.

How should you build the route? (To answer, select the appropriate options in the answer area.)

Work Area

```
routes.MapRoute(  
    name: "EditLog",  
      
      
    {  
        controller = "RunLog",  
          
    },  
      
    {  
          
    }  
);
```

```
routes.MapRoute(  
    name: "EditLog",  
    id = @"\d+",  
    url: "RunLog/EditLog/{id}",  
    action = "EditLog",  
    defaults: new  
    constraints: new  
  
    id = @"\d+",  
    url: "RunLog/EditLog/{id}",  
    action = "EditLog",  
    defaults: new  
    constraints: new  
{  
    controller = "RunLog",  
    id = @"\d+",  
    url: "RunLog/EditLog/{id}",  
    action = "EditLog",  
    defaults: new  
    constraints: new  
},  
    id = @"\d+",  
    url: "RunLog/EditLog/{id}",  
    action = "EditLog",  
    defaults: new  
    constraints: new  
{  
    id = @"\d+",  
    url: "RunLog/EditLog/{id}",  
    action = "EditLog",  
    defaults: new  
    constraints: new  
}  
);
```

Answer:

```
routes.MapRoute(
```

```
    name: "EditLog",
```

```
    id = @"\d+"  
    url: "RunLog/EditLog/{id}",  
    action = "EditLog",  
    defaults: new  
    constraints: new
```

```
    id = @"\d+"  
    url: "RunLog/EditLog/{id}",  
    action = "EditLog",  
    defaults: new  
    constraints: new
```

```
{
```

```
    controller = "RunLog",
```

```
    id = @"\d+"  
    url: "RunLog/EditLog/{id}",  
    action = "EditLog",  
    defaults: new  
    constraints: new
```

```
},
```

```
    id = @"\d+"  
    url: "RunLog/EditLog/{id}",  
    action = "EditLog",  
    defaults: new  
    constraints: new
```

```
{
```

```
    id = @"\d+"  
    url: "RunLog/EditLog/{id}",  
    action = "EditLog",  
    defaults: new  
    constraints: new
```

```
}
```

```
);
```

Question: 7

DRAG DROP

You need to ensure that the application uses RunLogRoleProvider custom role provider.

How should you modify the web.config file? (To answer, drag the appropriate line of code to the correct location or locations. Each line of code may be used once, more than once, or not at all. You may need to drag the split bar between panes or scroll to view content.)

```
<roleManager enabled="true" >
  <providers>
    <add name="RLRoleProvider"
        type="
        Application="RunnerLog"/>
    </providers>
  </roleManager>
```

Answer:

```
<roleManager defaultProvider="RLRoleProvider"
  enabled="true" >
  <providers>
    <add name="RLRoleProvider"
        type="RunnerLog.Providers.RunLogRoleProvider"
        Application="RunnerLog"/>
    </providers>
  </roleManager>
```

Question: 8

DRAG DROP

You need to ensure that only valid parameters are passed to the EditLog action.

How should you build the route? (To answer, drag the appropriate code segments to the correct location or locations. Each code segment may be used once, more than once, or not at all. You may need to drag the split bar between panes or scroll to view content.)

```
id = @"\d+"
```

```
url: "RunLog/EditLog/{id}",
```

```
action = "EditLog",
```

```
defaults: new
```

```
constraints: new
```

```
routes.MapRoute(  
    name: "EditLog",
```

```
    [redacted]
```

```
    [redacted]
```

```
{
```

```
    controller = "RunLog",
```

```
    [redacted]
```

```
},
```

```
[redacted]
```

```
{
```

```
    [redacted]
```

```
}
```

```
);
```

Answer:

```

routes.MapRoute(
    name: "EditLog",
    url: "RunLog/EditLog/{id}",
    defaults: new
    {
        controller = "RunLog",
        action = "EditLog",
    },
    constraints: new
    {
        id = @"\d+"
    }
);

```

Question: 9

If the canvas element is supported by the client browser, the application must display "London 2012" in the footer as text formatted by JavaScript at the end of the _Layout.cshtml file.

You need to modify the layout to ensure that "London 2012" is displayed as either formatted text or as plain text, depending on what the client browser supports.

Which code segment should you add?

- A. <canvas id="myFooter">
@(Request.Browser.JavaApplets ? new HtmlString("London 2012") : null)
</canvas>
- B. <canvas id="myFooter">London 2012</canvas>
- C. <canvas id="myCanvas">London 2012</canvas>
- D. <canvas id="myCanvas"></canvas>
<p>London 2012</p>

Answer: C

Question: 10

You need to add an action to RunLogController to validate the users' passwords.
Which code segment should you use?

- A.

```
public ActionResult Login(string username, string password)
{
    byte[] buffer = Encoding.UTF8.GetBytes(password + username);
    byte[] hash = MD5.Create().ComputeHash(buffer);
    ComparePassword(username, hash);
    return ContextDependentView();
}
```
- B.

```
[RequireHttps]
public ActionResult Login(string username, string password)
{
    byte[] buffer = Encoding.UTF8.GetBytes(password + username);
    byte[] hash = SHA1.Create().ComputeHash(buffer);
    ComparePassword(username, hash);
    return ContextDependentView();
}
```
- C.

```
public ActionResult Login(string username, string password)
{
    byte[] buffer = Encoding.UTF8.GetBytes(password + username);
    byte[] hash = SHA1.Create().ComputeHash(buffer);
    ComparePassword(username, hash);
    return ContextDependentView();
}
```
- D.

```
[RequireHttps]
public ActionResult Login(string username, string password)
{
    byte[] buffer = Encoding.UTF8.GetBytes(password + username);
    byte[] hash = MD5.Create().ComputeHash(buffer);
    ComparePassword(username, hash);
    return ContextDependentView();
}
```

- A. Option A
B. Option B
C. Option C
D. Option D

Answer: B

Question: 11

You need to make all of the rows in the table bold in the Views/RunLog/GetLog.cshtml view. Which code segment should you use?

- A. `Table > th:last-child { font-weight: bold; }`
- B. `Table+first-child{ font-weight: bold; }`
- C. `Table>tr>th:nth-child(2){font-weight: bold; }`
- D. `Table > tr {font-weight: bold;}`

Answer: D

Question: 12

You need to display the "miles" unit description after the distance in the GetLog view. Which line of code should you use to replace line GL21? (Each correct answer presents a complete solution. Choose all that apply.)

- A. `@log.Distance miles`
- B. `@Html.DisplayFor(model => log.Distance) miles`
- C. `@log.Distance.ToString() @Html.TextArea("miles")`
- D. `@Html.DisplayFor(model => log.Distance.ToString() + " miles")`

Answer: A, B

Question: 13

DRAG DROP

You need to implement security according to the business requirements. You have the following code:

```
Target 1
public class RunLogController : Controller
{
    Target 2
    public ActionResult GetLog()
    ...
    public ActionResult InsertLog()
    ...
    Target 3
    public ActionResult DeleteLog(int id)
    Target 4
    public ActionResult EditLog(int id)
    ...
}
```

Which code segments should you include in Target 1, Target 2, Target 3 and Target 4 to modify

RunLogController? To answer, drag the appropriate code segment to the correct targets. Each code segment may be used once, more than once, or not at all. You may need to drag the split bar between panes or scroll to view content.

Code Segments

- [Authorize(Roles = "Admin")]
- [Authorize]
- [Authorize(Users = "Admin")]
- [AllowAnonymous]
- [Authorize(Users = "")]

Answer area

- Target 1: Code Segment
- Target 2: Code Segment
- Target 3: Code Segment
- Target 4: Code Segment

Answer:

Target 1: [Authorize]

Target 2: [AllowAnonymous]

Target 3: [Authorize(Roles = "Admin")]

Target 4: [Authorize(Roles = "Admin")]

Question: 14

The RunLog/Views/InsertLog.cshtml view must display the /Images/stopwatch.png image and the "Insert Run Data" header text below the image. The view should resemble the exhibit. (Click the Exhibit button.)



Insert Run Data

RunDate

4/25/2012 9:06:16 AM

Distance

0

Time

HH:MM:SS

00:00:00

Create

The application must display the image above the field set.

You need to add the HTML code to `/Runlog/Views/InsertLog.cshtml` to display the image and header text.

Which code segment should you use?

- A.

```
<h2>
  Insert Run Data
</h2>
<div>
  
</div>
```
- B.

```
<div style="background: url('../../Images/StopWatch.png');">
  <h2>Insert Run Data</h2>
</div>
```
- C.

```
<div style="width: 130px; height: 100px;">
  <a href="../../Images/StopWatch.png"></a>
</div>
<h2>
  Insert Run Data
</h2>
```
- D.

```
<div style="width: 130px; height: 100px; background: url
('../../Images/StopWatch.png');">
</div>
<h2>
  Insert Run Data
</h2>
```

- A. Option A
B. Option B
C. Option C
D. Option D

Answer: D

Explanation:

Example:

```
<div style="background-image: url(..images/test-background.gif); height: 200px; width: 400px; border: 1px solid black;">Example of a DIV element with a background image:</div>
```

```
<div style="background-image: url(..images/test-background.gif); height: 200px; width: 400px; border: 1px solid black;"> </div>
```

Example of a DIV element with a background image:



Explanation:

Reference:

DIV BACKGROUND-IMAGE in the STYLE element

<http://www.w3.org/WAI/UA/TS/html401/cp0301/0301-CSS-DIV-BACKGROUND-IMAGE.html>