

Displaying a Table of Database Data (C#)

The goal of this tutorial is to explain how you can display an HTML table of database data in an ASP.NET MVC application. First, you learn how to use the scaffolding tools included in Visual Studio to generate a view that displays a set of records automatically. Next, you learn how to use a partial as a template when formatting database records.

Create the Model Classes

We are going to display the set of records from the Movies database table. The Movies database table contains the following columns:

Column Name	Data Type	Allow Nulls
Id	Int	False
Title	Nvarchar(200)	False
Director	NVarchar(50)	False
DateReleased	DateTime	False

In order to represent the Movies table in our ASP.NET MVC application, we need to create a model class. In this tutorial, we use the Microsoft Entity Framework to create our model classes.

*** Begin Note ***

In this tutorial, we use the Microsoft Entity Framework. However, it is important to understand that you can use a variety of different technologies to interact with a database from an ASP.NET MVC application including LINQ to SQL, NHibernate, or ADO.NET.

*** End Note ***

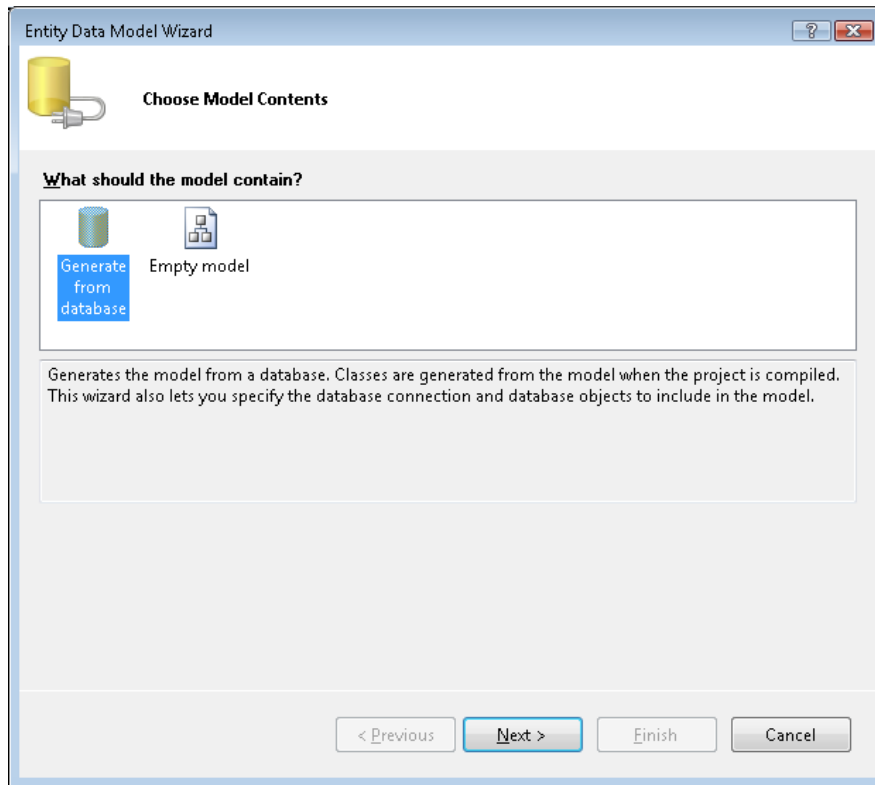
Follow these steps to launch the Entity Data Model Wizard:

1. Right-click the Models folder in the Solution Explorer window and then select the menu option **Add, New Item**.
2. Select the **Data** category and select the **ADO.NET Entity Data Model** template.
3. Give your data model the name *MoviesDBModel.edmx* and click the **Add** button.

After you click the Add button, the Entity Data Model Wizard appears (see Figure 1). Follow these steps to complete the wizard:

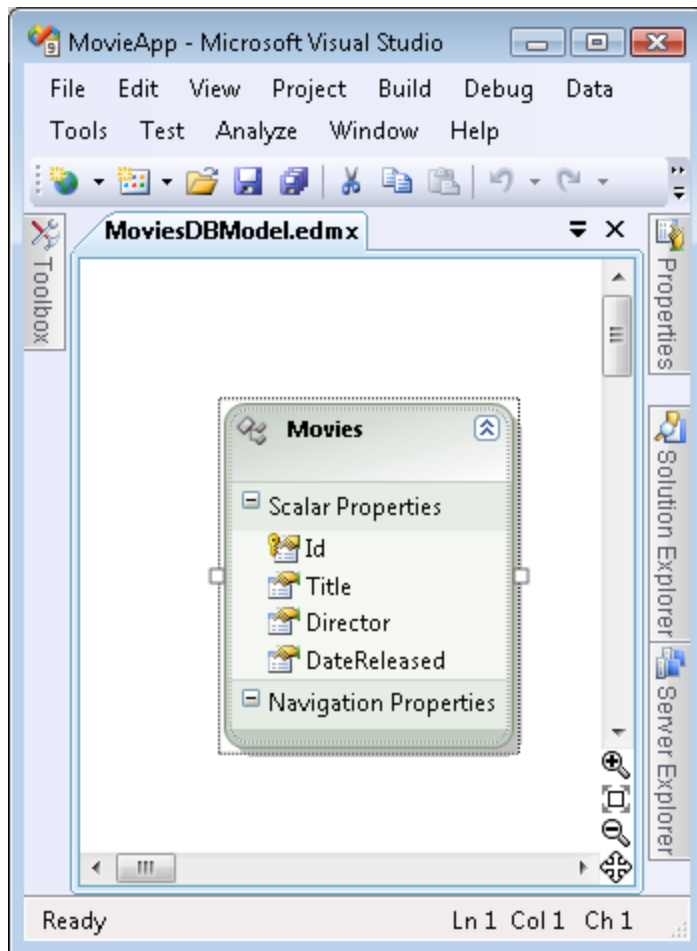
1. In the **Choose Model Contents** step, select the **Generate from database** option.
2. In the **Choose Your Data Connection** step, use the *MoviesDB.mdf* data connection and the name *MoviesDBEntities* for the connection settings. Click the **Next** button.
3. In the **Choose Your Database Objects** step, expand the Tables node, select the Movies table. Enter the namespace *Models* and click the **Finish** button.

Figure 1 – Generating a database model with the Entity Data Model Wizard



After you complete the Entity Data Model Wizard, the Entity Data Model Designer opens. The Designer should display the Movies entity (see Figure 2).

Figure 2 – The Entity Data Model Designer

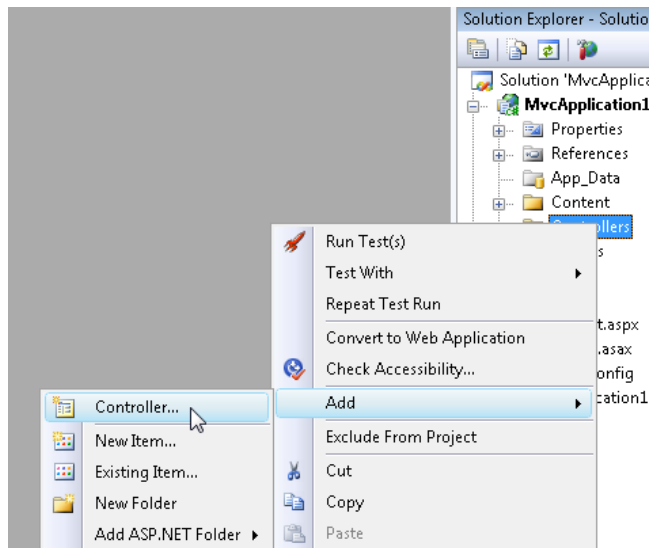


We need to make one change before we continue. The Entity Data Wizard generates a model class named *Movies* that represents the Movies database table. Because we'll use the *Movies* class to represent a particular movie, we need to modify the name of the class to be *Movie* instead of *Movies* (singular rather than plural).

Double-click the name of the class on the designer surface and change the name of the class from *Movies* to *Movie*. After making this change, click the **Save** button (the icon of the floppy disk) to generate the *Movie* class.

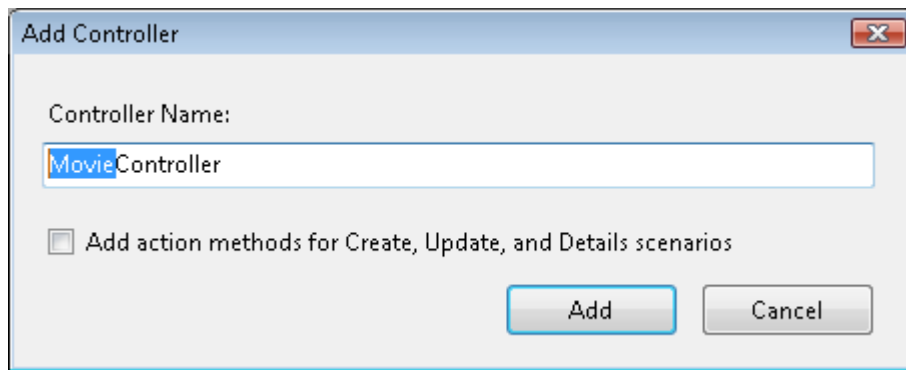
Create the Movies Controller

Now that we have a way to represent our database records, we can create a controller that returns the collection of movies. Within the Visual Studio Solution Explorer window, right-click the Controllers folder and select the menu option **Add, Controller** (see Figure 2).



When the **Add Controller** dialog appears, enter the controller name **MovieController** (see Figure 3). Click the **Add** button to add the new controller.

Figure 3 – The Add Controller dialog



We need to modify the **Index()** action exposed by the **Movie** controller so that it returns the set of database records. Modify the controller so that it looks like the controller in Listing 1.

Listing 1 – Controllers\MovieController.cs

```
using System.Linq;
using System.Web.Mvc;
using MvcApplication1.Models;

namespace MvcApplication1.Controllers
{
    public class MovieController : Controller
    {
        //
        // GET: /Movie/
        public ActionResult Index()
```

```

    {
        var entities = new MoviesDBEntities();
        return View(entities.MovieSet.ToList());
    }
}

```

In Listing 1, the `MoviesDBEntities` class is used to represent the `MoviesDB` database. To use this class, you need to import the `MvcApplication1.Models` namespace like this:

```
using MvcApplication1.Models;
```

The expression `entities.MovieSet.ToList()` returns the set of all movies from the `Movies` database table.

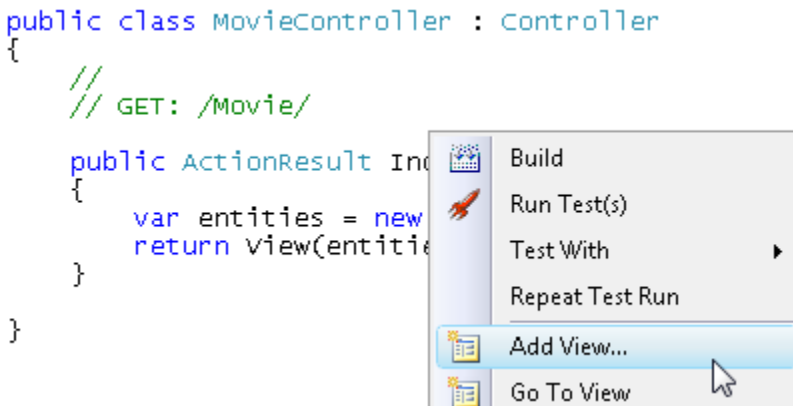
Create the View

The easiest way to display a set of database records in an HTML table is to take advantage of the scaffolding provided by Visual Studio.

Build your application by selecting the menu option **Build, Build Solution**. You must build your application before opening the **Add View** dialog or your data classes won't appear in the dialog.

Right-click the `Index()` action and select the menu option **Add View** (see Figure 4).

Figure 4 – Adding a view



In the **Add View** dialog, check the checkbox labeled **Create a strongly-typed view**. Select the `Movie` class as the **view data class**. Select `List` as the **view content** (see Figure 5). Selecting these options will generate a strongly-typed view that displays a list of movies.

Figure 5 – The Add View dialog

The 'Add View' dialog box shows the following configuration:

- View name:** Index
- ☐ Create a partial view (.ascx)
- ☒ Create a strongly-typed view
 - View data class:** MvcApplication1.Models.Movie
 - View content:** List
- ☒ Select master page
 - Master page:** ~/Views/Shared/Site.Master
- ContentPlaceHolderID:** MainContent

Buttons: Add, Cancel

After you click the **Add** button, the view in Listing 2 is generated automatically. This view contains the code required to iterate through the collection of movies and display each of the properties of a movie.

Listing 2 – Views\Movie\Index.aspx

```
<%@ Page Title="" Language="C#" MasterPageFile="~/Views/Shared/Site.Master"
Inherits="System.Web.Mvc.ViewPage<IEnumerable<MvcApplication1.Models.Movie>>"
%>

<asp:Content ID="Content1" ContentPlaceHolderID="TitleContent"
runat="server">
    Index
</asp:Content>

<asp:Content ID="Content2" ContentPlaceHolderID="MainContent" runat="server">
    <h2>Index</h2>
    <table>
        <tr>
            <th></th>
            <th>
                Id
            </th>
            <th>
                Title
            </th>
            <th>
                Director
            </th>
            <th>
                DateReleased
            </th>
        </tr>
```

```

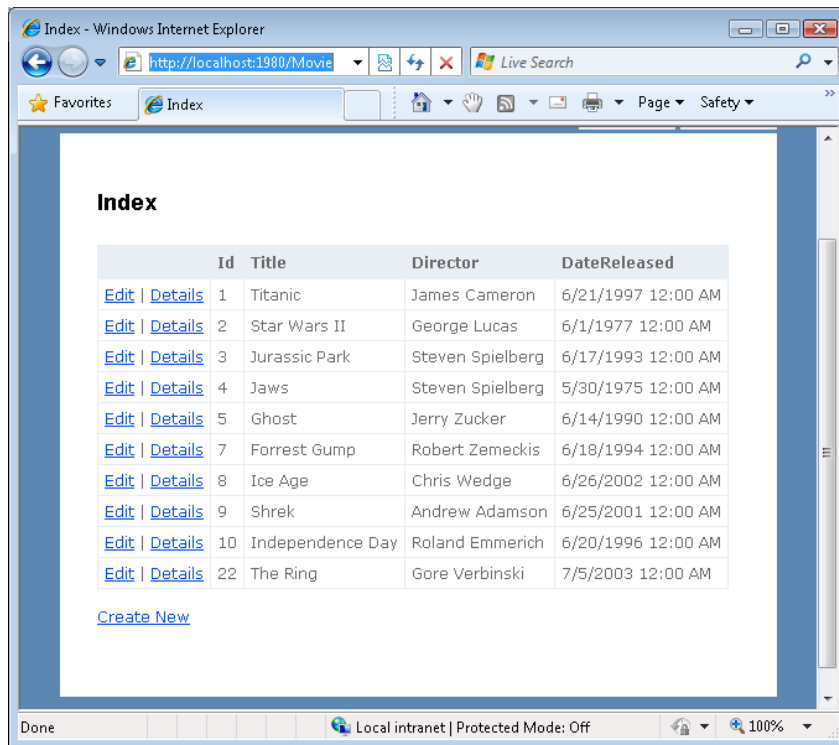
    <% foreach (var item in Model) { %>
        <tr>
            <td>
                <%= Html.ActionLink("Edit", "Edit", new { id=item.Id }) %> |
                <%= Html.ActionLink("Details", "Details", new { id=item.Id
            })%>
            </td>
            <td>
                <%= Html.Encode(item.Id) %>
            </td>
            <td>
                <%= Html.Encode(item.Title) %>
            </td>
            <td>
                <%= Html.Encode(item.Director) %>
            </td>
            <td>
                <%= Html.Encode(String.Format("{0:g}", item.DateReleased)) %>
            </td>
        </tr>
    <% } %>
</table>

<p>
    <%= Html.ActionLink("Create New", "Create") %>
</p>
</asp:Content>

```

You can run the application by selecting the menu option **Debug, Start Debugging** (or hitting the F5 key). Running the application launches Internet Explorer. If you navigate to the /Movie URL then you'll see the page in Figure 6.

Figure 6 – A table of movies



If you don't like anything about the appearance of the grid of database records in Figure 6 then you can simply modify the Index view. For example, you can change the *DateReleased* header to *Date Released* by modifying the Index view.

Create a Template with a Partial

When a view gets too complicated, it is a good idea to start breaking the view into partials. Using partials makes your views easier to understand and maintain. We'll create a partial that we can use as a template to format each of the movie database records.

Follow these steps to create the partial:

1. Right-click the Views\Movie folder and select the menu option **Add View**.
2. Check the checkbox labeled *Create a partial view (.ascx)*.
3. Name the partial *MovieTemplate*.
4. Check the checkbox labeled **Create a strongly-typed view**.
5. Select Movie as the *view data class*.
6. Select Empty as the *view content*.
7. Click the **Add** button to add the partial to your project.

After you complete these steps, modify the MovieTemplate partial to look like Listing 3.

Listing 3 – Views\Movie\MovieTemplate.ascx

```

<%@ Control Language="C#"
Inherits="System.Web.Mvc.ViewUserControl<MvcApplication1.Models.Movie>" %>

<tr>
    <td>
        <%= Html.Encode(Model.Id) %>
    </td>
    <td>
        <%= Html.Encode(Model.Title) %>
    </td>
    <td>
        <%= Html.Encode(Model.Director) %>
    </td>
    <td>
        <%= Html.Encode(String.Format("{0:g}", Model.DateReleased)) %>
    </td>
</tr>

```

The partial in Listing 3 contains a template for a single row of records.

The modified Index view in Listing 4 uses the MovieTemplate partial.

Listing 4 – Views\Movie\Index.aspx

```

<%@ Page Title="" Language="C#" MasterPageFile="~/Views/Shared/Site.Master"
Inherits="System.Web.Mvc.ViewPage<IEnumerable<MvcApplication1.Models.Movie>>"
%>

<asp:Content ID="Content2" ContentPlaceHolderID="MainContent" runat="server">
    <h2>Index</h2>
    <table>
        <tr>
            <th>
                Id
            </th>
            <th>
                Title
            </th>
            <th>
                Director
            </th>
            <th>
                DateReleased
            </th>
        </tr>
        <% foreach (var item in Model) { %>
            <% Html.RenderPartial("MovieTemplate", item); %>
        <% } %>
    </table>
</asp:Content>

```

The view in Listing 4 contains a foreach loop that iterates through all of the movies. For each movie, the MovieTemplate partial is used to format the movie. The MovieTemplate is rendered by calling the RenderPartial() helper method.

The modified Index view renders the very same HTML table of database records. However, the view has been greatly simplified.

*** Begin Warning ***

The `RenderPartial()` method is different than most of the other helper methods because it does not return a string. Therefore, you must call the `RenderPartial()` method using `<% Html.RenderPartial(); %>` instead of `<%= Html.RenderPartial(); %>`.

*** End Warning ***

Summary

The goal of this tutorial was to explain how you can display a set of database records in an HTML table. First, you learned how to return a set of database records from a controller action by taking advantage of the Microsoft Entity Framework. Next, you learned how to use Visual Studio scaffolding to generate a view that displays a collection of items automatically. Finally, you learned how to simplify the view by taking advantage of a partial. You learned how to use a partial as a template so that you can format each database record.