Working with Data in ASP.NET 2.0 :: An Overview of Editing and Deleting Data in the DataList

Introduction

In the An Overview of Inserting, Updating, and Deleting Data tutorial we looked at how to insert, update, and delete data using the application architecture, an ObjectDataSource, and the GridView, DetailsView, and FormView controls. With the ObjectDataSource and these three data Web controls, implementing simple data modification interfaces was a snap and involved merely ticking a checkbox from a smart tag. No code needed to be written.

Unfortunately, the DataList lacks the built-in editing and deleting capabilities inherent in the GridView control. This missing functionality is due in part to the fact that the DataList is a relic from the previous version of ASP.NET, when declarative data source controls and code-free data modification pages were unavailable. While the DataList in ASP.NET 2.0 does not offer the same out of the box data modification capabilities as the GridView, we can use ASP.NET 1.x techniques to include such functionality. This approach requires a bit of code but, as we'll see in this tutorial, the DataList has some events and properties in place to aid in this process.

In this tutorial we'll see how to create a DataList that supports editing and deleting of its underlying data. Future tutorials will examine more advanced editing and deleting scenarios, including input field validation, gracefully handling exceptions raised from the Data Access or Business Logic Layers, and so on.

Note: Like the DataList, the Repeater control lacks the out of the box functionality for inserting, updating, or deleting. While such functionality can be added, the DataList includes properties and events not found in the Repeater that simplify adding such capabilities. Therefore, this tutorial and future ones that look at editing and deleting will focus strictly on the DataList.

Step 1: Creating the Editing and Deleting Tutorials Web Pages

Before we start exploring how to update and delete data from a DataList, let's first take a moment to create the ASP.NET pages in our website project that we'll need for this tutorial and the next several ones. Start by adding a new folder named `EditDeleteDataList`. Next, add the following ASP.NET pages to that folder, making sure to associate each page with the `Site.master` master page:

- `Default.aspx`
- `Basics.aspx`
- `BatchUpdate.aspx`
- `ErrorHandling.aspx`
- `UIValidation.aspx`
- `CustomizedUI.aspx`
- `OptimisticConcurrency.aspx`
- `ConfirmationOnDelete.aspx`
- `UserLevelAccess.aspx`

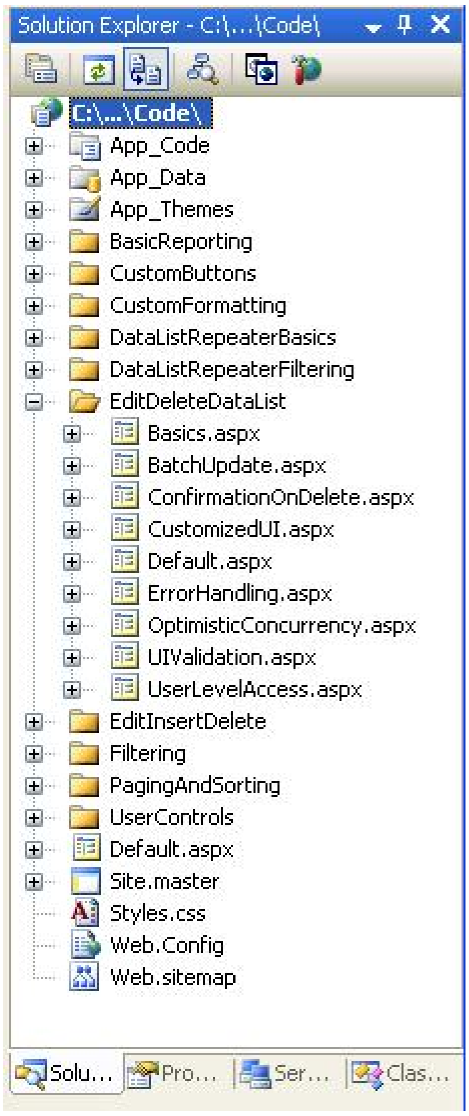


Figure 1: Add the ASP.NET Pages for the Tutorials

Like in the other folders, `Default.aspx` in the `EditDeleteDataList` folder lists the tutorials in its section. Recall that the `SectionLevelTutorialListing.ascx` User Control provides this functionality. Therefore, add this User Control to `Default.aspx` by dragging it from the Solution Explorer onto the page's Design view.

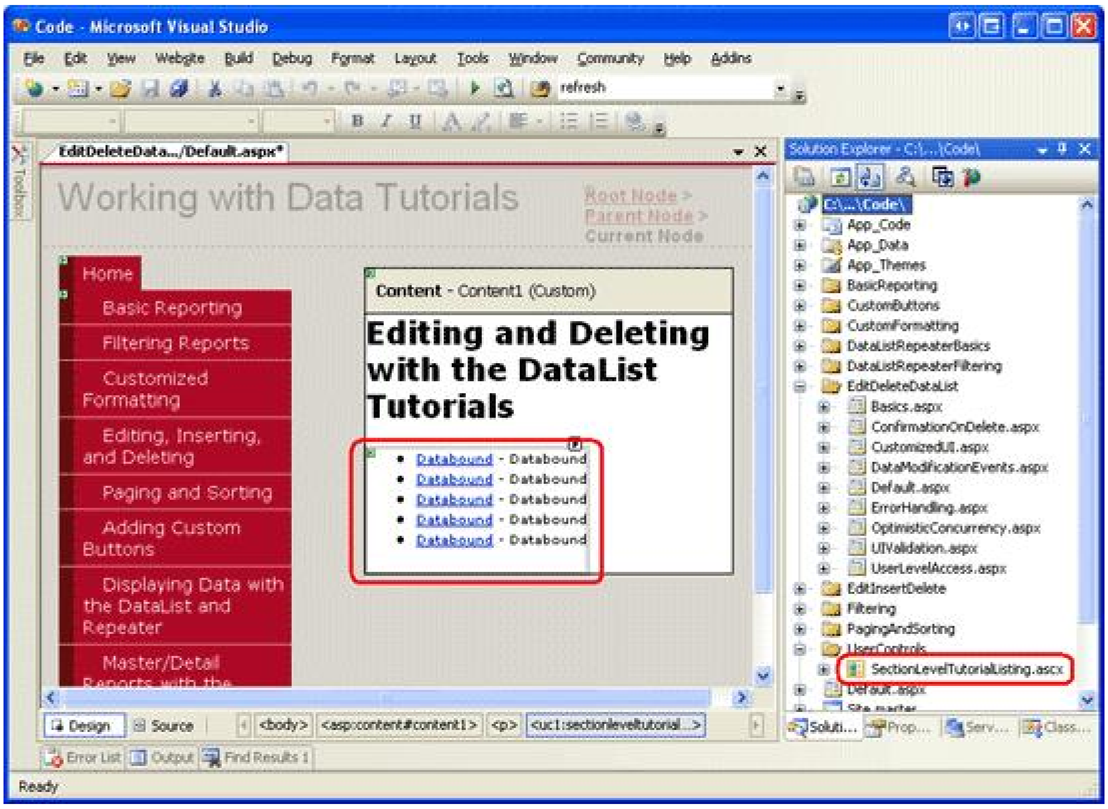

Code - Microsoft Visual Studio
File Edit View Website Build Debug Format Layout Tools Window Community Help Addins
EditDeleteData.../Default.aspx*
Working with Data Tutorials
Root Node > Parent Node > Current Node
Home
Basic Reporting
Filtering Reports
Customized Formatting
Editing, Inserting, and Deleting
Paging and Sorting
Adding Custom Buttons
Displaying Data with the DataList and Repeater
Master/Detail Reports with the
Content - Content1 (Custom)
Editing and Deleting with the DataList Tutorials
Databound - Databound
Solution Explorer - C:\...\Code\
C:\...\Code\
App_Code
App_Data
App_Themes
BasicReporting
CustomButtons
CustomFormatting
DataListRepeaterBasics
DataListRepeaterFiltering
EditDeleteDataList
Basics.aspx
ConfirmationOnDelete.aspx
CustomizedUI.aspx
DataModificationEvents.aspx
Default.aspx
ErrorHandling.aspx
OptimisticConcurrency.aspx
UIValidation.aspx
UserLevelAccess.aspx
EditInsertDelete
Filtering
PagingAndSorting
UserControls
SectionLevelTutorialListing.ascx
Default.aspx
Design Source
Error List Output Find Results 1
Ready

Figure 2: Add the `SectionLevelTutorialListing.ascx` User Control to `Default.aspx`

Lastly, add the pages as entries to the `Web.sitemap` file. Specifically, add the following markup after the Master/Detail Reports with the DataList and Repeater `<siteMapNode>`:

```
<siteMapNode
    title="Editing and Deleting with the DataList"
    description="Samples of Reports that Provide Editing and Deleting Capabilities"
    url="~/EditDeleteDataList/Default.aspx" >

    <siteMapNode
        title="Basics"
        description="Examines the basics of editing and deleting with the
                     DataList control."
        url="~/EditDeleteDataList/Basics.aspx" />

    <siteMapNode
        title="Batch Update"
        description="Examines how to update multiple records at once in a
                     fully-editable DataList."
        url="~/EditDeleteDataList/BatchUpdate.aspx" />

    <siteMapNode
        title="Error Handling"
        description="Learn how to gracefully handle exceptions raised during the
                     data modification workflow."
        url="~/EditDeleteDataList/ErrorHandling.aspx" />

    <siteMapNode
        title="Adding Data Entry Validation"
        description="Help prevent data entry errors by providing validation."
        url="~/EditDeleteDataList/UIValidation.aspx" />

    <siteMapNode
        title="Customize the User Interface"
        description="Customize the editing user interfaces."
        url="~/EditDeleteDataList/CustomizedUI.aspx" />

    <siteMapNode
```

```
        title="Optimistic Concurrency"
        description="Learn how to help prevent simultaneous users from
                     overwritting one another&apos;s changes."
        url="~/EditDeleteDataList/OptimisticConcurrency.aspx" />

    <siteMapNode
        title="Confirm On Delete"
        description="Prompt a user for confirmation when deleting a record."
        url="~/EditDeleteDataList/ConfirmationOnDelete.aspx" />

    <siteMapNode
        title="Limit Capabilities Based on User"
        description="Learn how to limit the data modification functionality
                     based on the user&apos;s role or permissions."
        url="~/EditDeleteDataList/UserLevelAccess.aspx" />

</siteMapNode>
```

After updating `Web.sitemap`, take a moment to view the tutorials website through a browser. The menu on the left now includes items for the DataList editing and deleting tutorials.

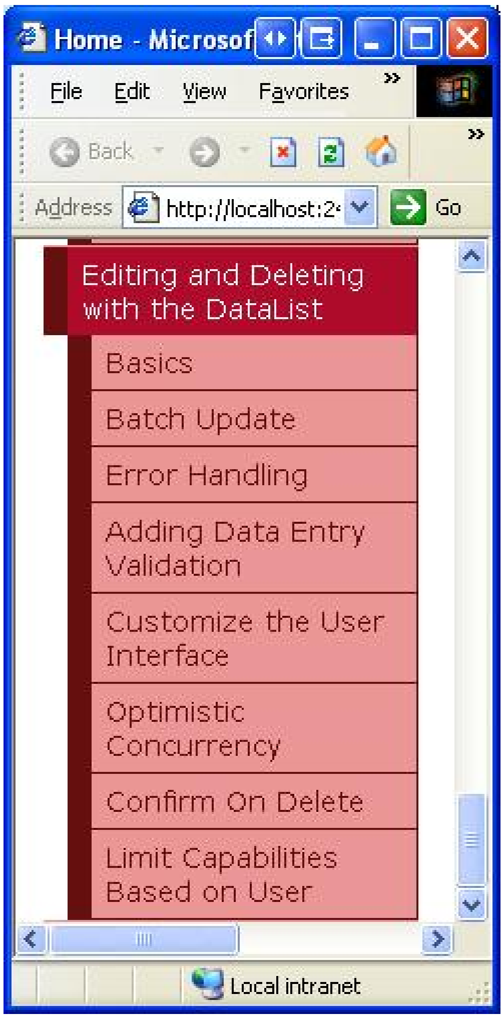


Figure 3: The Site Map Now Includes Entries for the DataList Editing and Deleting Tutorials

Step 2: Examining Techniques for Updating and Deleting Data

Editing and deleting data with the GridView is so easy because, underneath the covers, the GridView and ObjectDataSource work in concert. As discussed in the Examining the Events Associated with Inserting, Updating, and Deleting tutorial, when a row's Update button is clicked, the GridView automatically assigns its fields that used two-way databinding to the `UpdateParameters` collection of its ObjectDataSource and then invokes that ObjectDataSource's `Update()` method.

Sadly, the DataList does not provide any of this built-in functionality. It is our responsibility to ensure that the user's values are assigned to the ObjectDataSource's parameters and that its `Update()` method is called. To aid us in this endeavor, the DataList provides the following properties and events:

- **The `DataKeyField` property** — when updating or deleting, we need to be able to uniquely identify each item in the DataList. Set this property to the primary key field of the displayed data. Doing so will populate the DataList's `DataKeys` collection with the specified `DataKeyField` value for each DataList item.
- **The `EditCommand` event** — fires when a Button, LinkButton, or ImageButton whose `CommandName` property is set to "Edit" is clicked.
- **The `CancelCommand` event** — fires when a Button, LinkButton, or ImageButton whose `CommandName` property is set to "Cancel" is clicked.
- **The `UpdateCommand` event** — fires when a Button, LinkButton, or ImageButton whose `CommandName` property is set to "Update" is clicked.
- **The `DeleteCommand` event** — fires when a Button, LinkButton, or ImageButton whose `CommandName` property is set to "Delete" is clicked.

Using these properties and events, there are four approaches we can use to update and delete data from the DataList:

1. **Using ASP.NET 1.x Techniques** — the DataList existed prior to ASP.NET 2.0 and ObjectDataSources and was able to update and delete data entirely through programmatic means. This technique ditches the ObjectDataSource altogether and requires that we bind the data to the DataList directly from the Business Logic Layer, both in retrieving the data to display and when updating or deleting a record.
2. **Using a Single ObjectDataSource Control on the Page for Selecting, Updating, and Deleting** — while the DataList lacks the GridView's inherent editing and deleting capabilities, there's no reason we can't add them in ourselves. With this approach, we use an ObjectDataSource just like in the GridView examples, but must create an event handler for the DataList's `UpdateCommand` event where we set the ObjectDataSource's parameters and call its `Update()` method.
3. **Using an ObjectDataSource Control for Selecting, but Updating and Deleting Directly Against the BLL** — when using option 2, we need to write a bit of code in the `UpdateCommand` event, assigning parameter values and so on. Instead, we can stick with using the ObjectDataSource for selecting, but make the updating and deleting calls directly against the BLL (like with option 1). In my opinion, updating data by interfacing directly with the BLL leads to more readable code than assigning the ObjectDataSource's `UpdateParameters` and calling its `Update()` method.
4. **Using Declarative Means through Multiple ObjectDataSources** — the previous three approaches all require a bit of code. If you'd rather keep using as much declarative syntax as possible, a final option is to include multiple ObjectDataSources on the page. The first ObjectDataSource retrieves the data from the BLL and binds it to the DataList. For updating, another ObjectDataSource is added, but added directly within the DataList's `EditItemTemplate`. To include deleting support, yet another ObjectDataSource would be needed in the `ItemTemplate`. With this approach, these embedded ObjectDataSource's use `ControlParameters` to declaratively bind the ObjectDataSource's parameters to the user input controls (rather than having to specify them programmatically in the DataList's `UpdateCommand` event handler). This approach still requires a bit of code — we need to call the embedded ObjectDataSource's `Update()` or `Delete()` command — but requires far less than with the other three approaches. The downside here is that the multiple ObjectDataSources do clutter up the page, detracting from the overall readability.

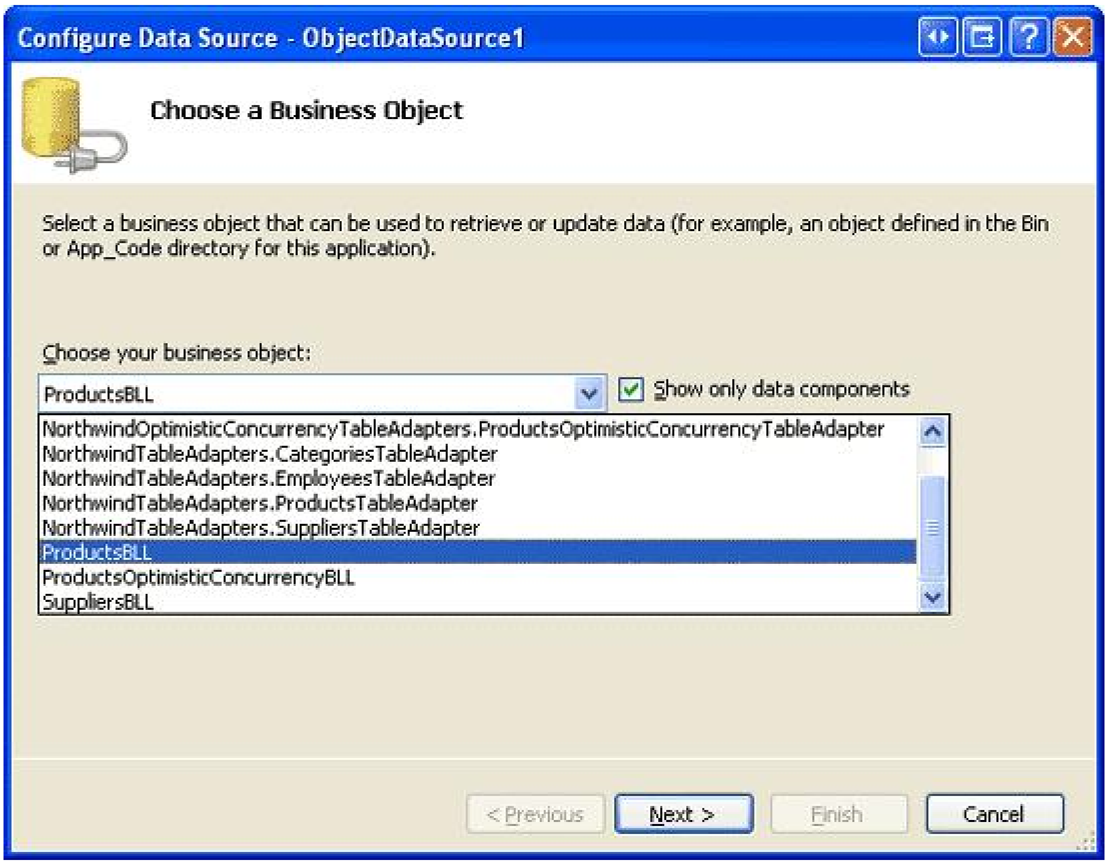
If forced to only ever use one of these approaches, I'd choose option 1 because it provides the most flexibility and because the DataList was originally designed to accommodate this pattern. While the DataList was extended to work with the ASP.NET 2.0 data source controls, it does not have all of the extensibility points or features of the "official" ASP.NET 2.0 data Web controls (the GridView, DetailsView, and FormView). Options 2 through 4 are not without merit, though.

This and the future editing and deleting tutorials will use an ObjectDataSource for retrieving the data to display and direct calls to the BLL to update and delete data (option 3).

Step 3: Adding the DataList and Configuring its ObjectDataSource

In this tutorial we will create a DataList that lists product information and, for each product, provides the user the ability to edit the name and price and to delete the product altogether. In particular, we will retrieve the records to display using an ObjectDataSource, but perform the update and delete actions by interfacing directly with the BLL. Before we worry about implementing the editing and deleting capabilities to the DataList, let's first get the page to display the products in a read-only interface. Since we've examined these steps in previous tutorials, I'll proceed through them quickly.

Start by opening the `Basics.aspx` page in the `EditDeleteDataList` folder and, from the Design view, add a DataList to the page. Next, from the DataList's smart tag, create a new ObjectDataSource. Since we are working with product data, configure it to use the `ProductsBLL` class. To retrieve *all* products, choose the `GetProducts()` method in the SELECT tab.



Select a business object that can be used to retrieve or update data (for example, an object defined in the Bin or App_Code directory for this application).

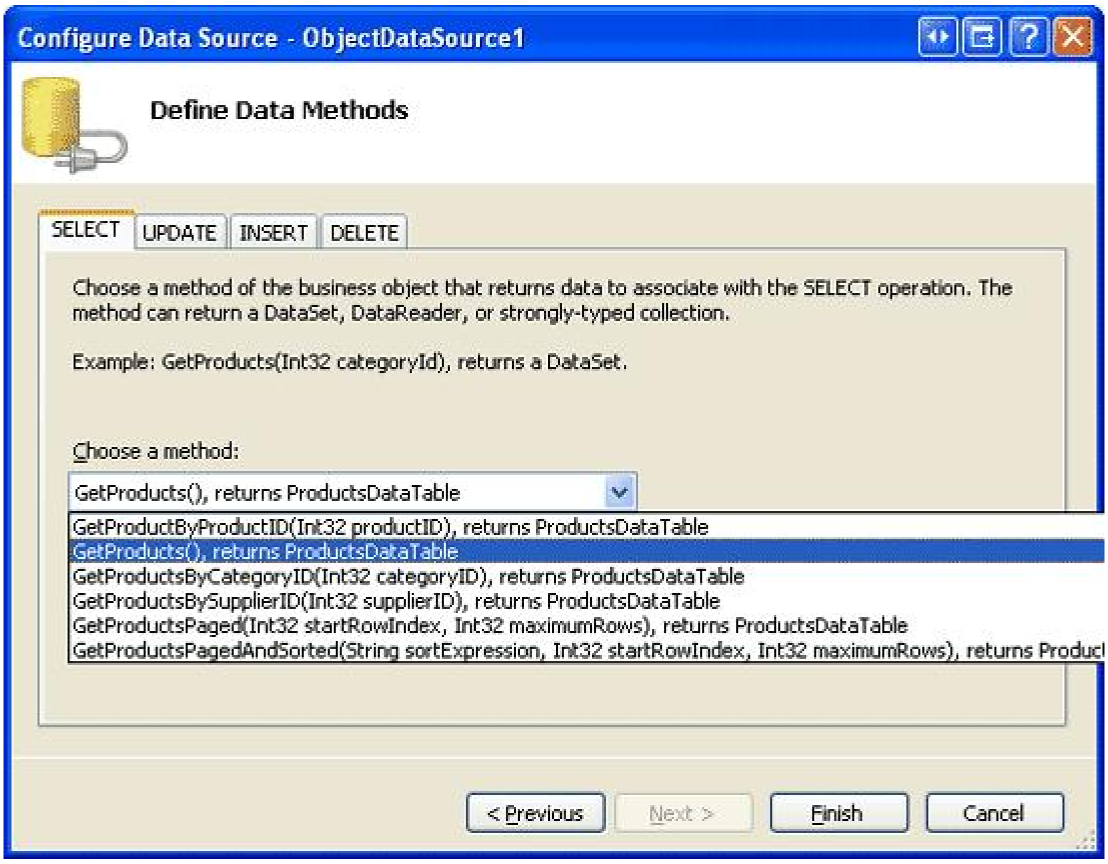
Choose your business object:

ProductsBLL

Show only data components ✓

NorthwindOptimisticConcurrencyTableAdapters.ProductsOptimisticConcurrencyTableAdapter
NorthwindTableAdapters.CategoriesTableAdapter
NorthwindTableAdapters.EmployeesTableAdapter
NorthwindTableAdapters.ProductsTableAdapter
NorthwindTableAdapters.SuppliersTableAdapter
ProductsBLL
ProductsOptimisticConcurrencyBLL
SuppliersBLL

Figure 4: Configure the ObjectDataSource to Use the `ProductsBLL` Class


Configure Data Source - ObjectDataSource1

Define Data Methods

Choose a method of the business object that returns data to associate with the SELECT operation. The method can return a DataSet, DataReader, or strongly-typed collection.

Example: GetProducts(Int32 categoryId), returns a DataSet.

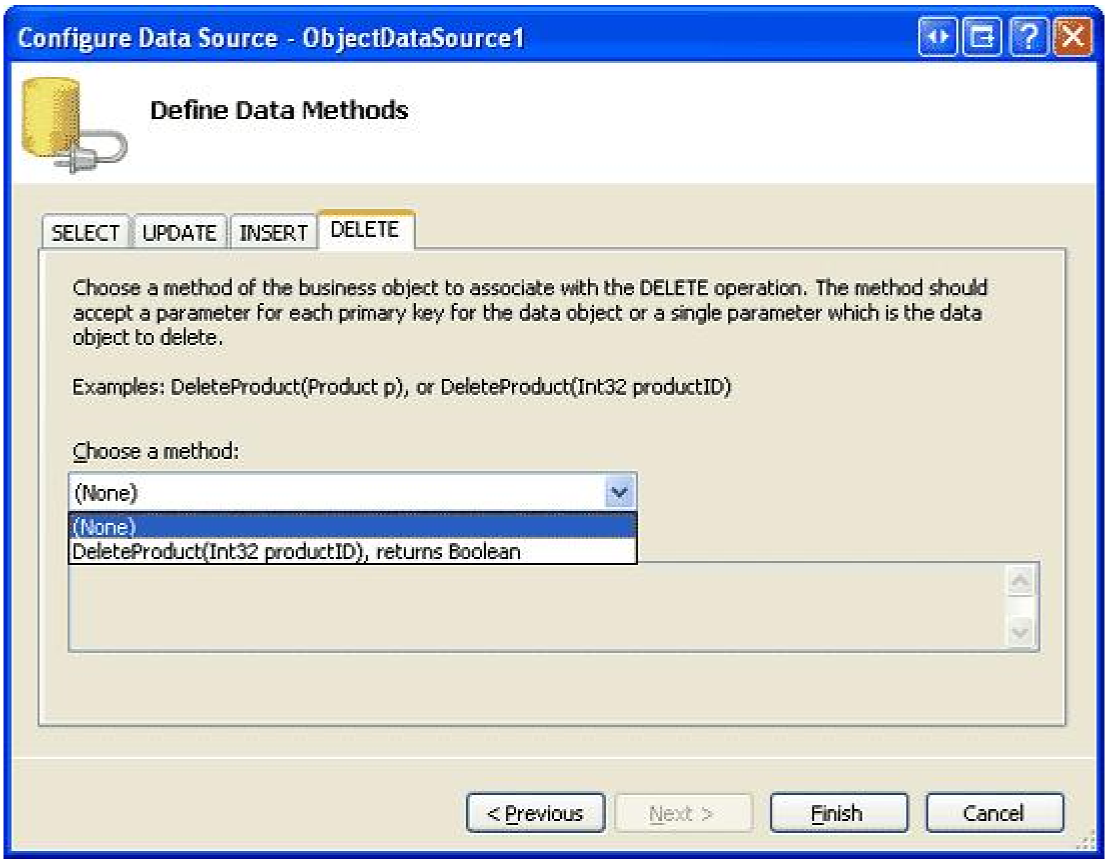
Choose a method:

GetProducts(), returns ProductsDataTable

GetProductByProductID(Int32 productID), returns ProductsDataTable
GetProducts(), returns ProductsDataTable
GetProductsByCategoryID(Int32 categoryID), returns ProductsDataTable
GetProductsBySupplierID(Int32 supplierID), returns ProductsDataTable
GetProductsPaged(Int32 startRowIndex, Int32 maximumRows), returns ProductsDataTable
GetProductsPagedAndSorted(String sortExpression, Int32 startRowIndex, Int32 maximumRows), returns Produc

Figure 5: Return the Product Information Using the `GetProducts()` Method

The DataList, like the GridView, is not designed for inserting new data; therefore, select the (None) option from the drop-down list in the INSERT tab. Also choose (None) for the UPDATE and DELETE tabs since the updates and deletes will be performed programmatically through the BLL.


Configure Data Source - ObjectDataSource1

Define Data Methods

Choose a method of the business object to associate with the DELETE operation. The method should accept a parameter for each primary key for the data object or a single parameter which is the data object to delete.

Examples: DeleteProduct(Product p), or DeleteProduct(Int32 productID)

Choose a method:

(None)

(None)
DeleteProduct(Int32 productID), returns Boolean

Figure 6: Confirm that the Drop-Down Lists in the ObjectDataSource's INSERT, UPDATE, and DELETE Tabs are Set to (None)

After configuring the ObjectDataSource, click Finish, returning to the Designer. As we've seen in past examples, when completing the ObjectDataSource configuration, Visual Studio automatically creates an `ItemTemplate` for the DropDownList, displaying each of the data fields. Replace this `ItemTemplate` with one that displays only the product's name and price. Also, set the `RepeatColumns` property to 2.

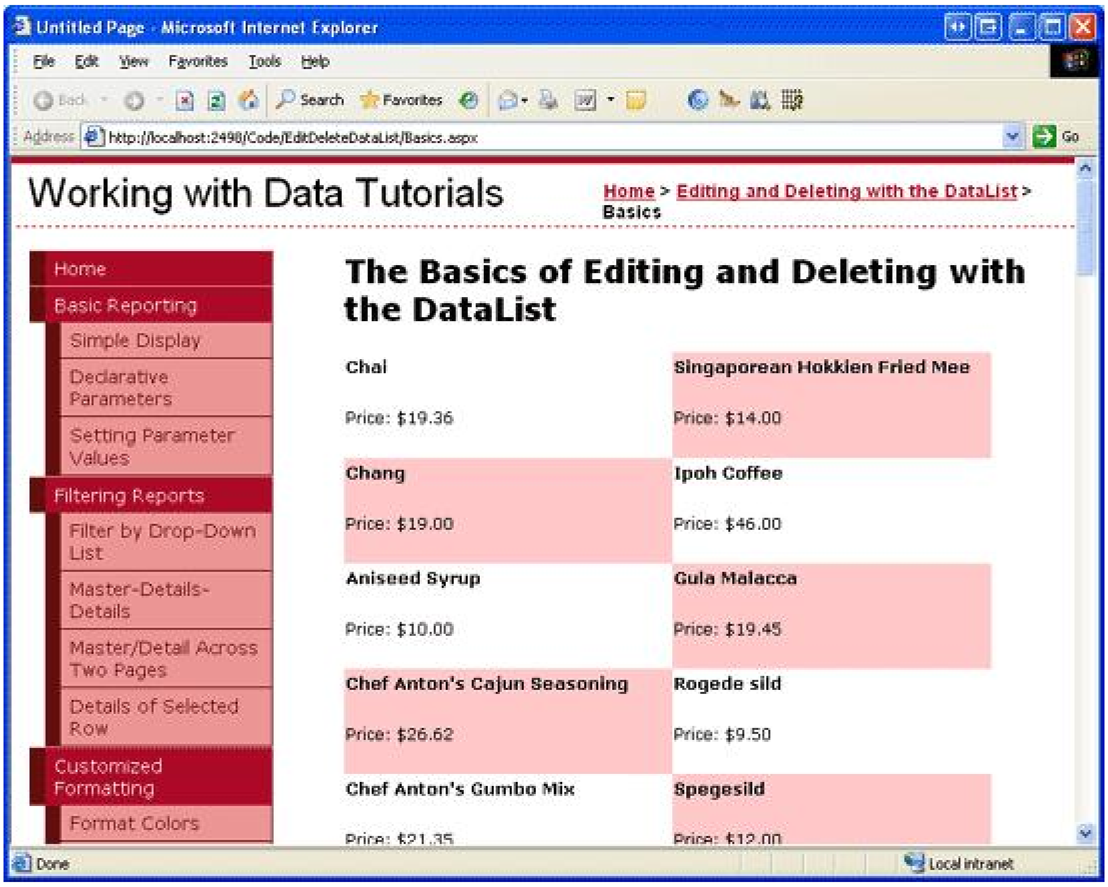
Note: As discussed in the *Overview of Inserting, Updating, and Deleting Data* tutorial, when modifying data using the ObjectDataSource our architecture requires that we remove the `OldValuesParameterFormatString` property from the ObjectDataSource's declarative markup (or reset it to its default value, `{0}`). In this tutorial, however, we are using the ObjectDataSource only for retrieving data. Therefore, we do not need to modify the ObjectDataSource's `OldValuesParameterFormatString` property value (although it doesn't hurt to do so).

After replacing the default DataList `ItemTemplate` with a customized one, the declarative markup on your page should look similar to the following:

```
<asp:DataList ID="DataList1" runat="server" DataKeyField="ProductID"
    DataSourceID="ObjectDataSource1" RepeatColumns="2">
    <ItemTemplate>
        <h5>
            <asp:Label runat="server" ID="ProductNameLabel"
                Text='<%# Eval("ProductName") %>'></asp:Label>
        </h5>
        Price: <asp:Label runat="server" ID="Label1"
                    Text='<%# Eval("UnitPrice", "{0:C}") %>' />
        <br />
        <br />
    </ItemTemplate>
</asp:DataList>

<asp:ObjectDataSource ID="ObjectDataSource1" runat="server"
    SelectMethod="GetProducts" TypeName="ProductsBLL"
    OldValuesParameterFormatString="original_{0}">
</asp:ObjectDataSource>
```

Take a moment to view our progress through a browser. As Figure 7 shows, the DataList displays the product name and unit price for each product in two columns.


Untitled Page - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://localhost:2498/Code/EditDeleteDataList/Basics.aspx
Go
Done
Local intranet

Working with Data Tutorials

Home > Editing and Deleting with the DataList > Basics

Home
Basic Reporting
Simple Display
Declarative Parameters
Setting Parameter Values
Filtering Reports
Filter by Drop-Down List
Master-Details-Details
Master/Detail Across Two Pages
Details of Selected Row
Customized Formatting
Format Colors

The Basics of Editing and Deleting with the DataList

Chai Price: $19.36	Singaporean Hokkien Fried Mee Price: $14.00
Chang Price: $19.00	Ipoh Coffee Price: $46.00
Aniseed Syrup Price: $10.00	Gula Malacca Price: $19.45
Chef Anton's Cajun Seasoning Price: $26.62	Rogede sild Price: $9.50
Chef Anton's Gumbo Mix Price: $21.35	Spegesild Price: $12.00

Figure 7: The Products' Names and Prices are Displayed in a Two-Column DataList

Note: The DataList has a number of properties that are required for the updating and deleting process, and these values are stored in view state. Therefore, when building a DataList that supports editing or deleting data, it is essential that the DataList's view state be enabled.

The astute reader may recall that we were able to disable view state when creating editable GridViews, DetailsViews, and FormViews. This is because ASP.NET 2.0 Web controls can include *control state*, which is state persisted across postbacks like view state, but deemed essential.

Disabling view state in the GridView merely omits trivial state information, but maintains the control state (which includes the state necessary for editing and deleting). The DataList, having been created in the ASP.NET 1.x timeframe, does not utilize control state and therefore must have view state enabled. See Control State vs. View State for more information on the purpose of control state and how it differs from view state.

Step 4: Adding an Editing User Interface

The GridView control is composed of a collection of fields (BoundFields, CheckBoxFields, TemplateFields, and so on). These fields can adjust their rendered markup depending on their mode. For example, when in read-only mode, a BoundField displays its data field value as text; when in edit mode, it renders a TextBox Web control whose `Text` property is assigned the data field value.

The DataList, on the other hand, renders its items using templates. Read-only items are rendered using the `ItemTemplate` whereas items in edit mode are rendered via the `EditItemTemplate`. At this point, our DataList has only an `ItemTemplate`. To support item-level editing functionality we need to add an `EditItemTemplate` that contains the markup to be displayed for the editable item. For this tutorial, we'll use TextBox Web controls for editing the product's name and unit price.

The `EditItemTemplate` can be created either declaratively or through the Designer (by selecting the Edit

Templates option from the DataList's smart tag). To use the Edit Templates option, first click the Edit Templates link in the smart tag and then select the `EditItemTemplate` item from the drop-down list.

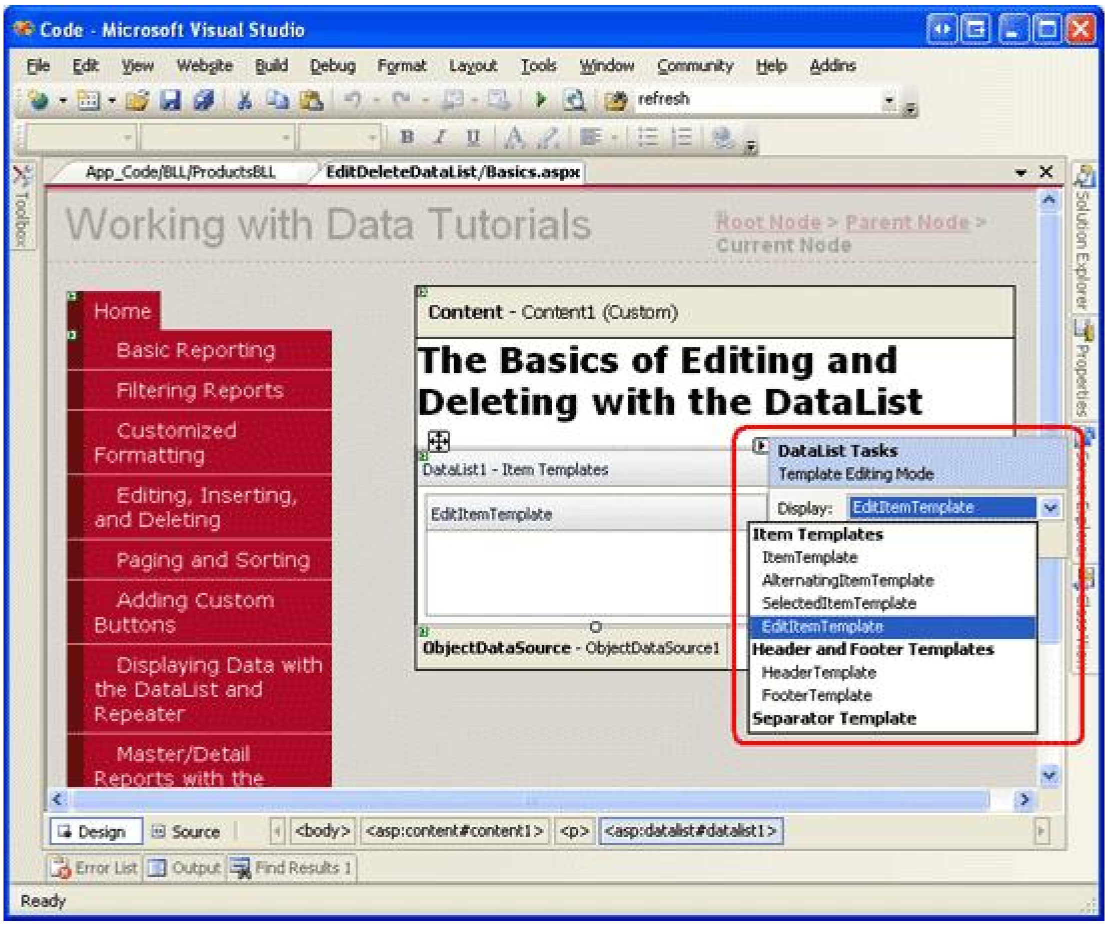
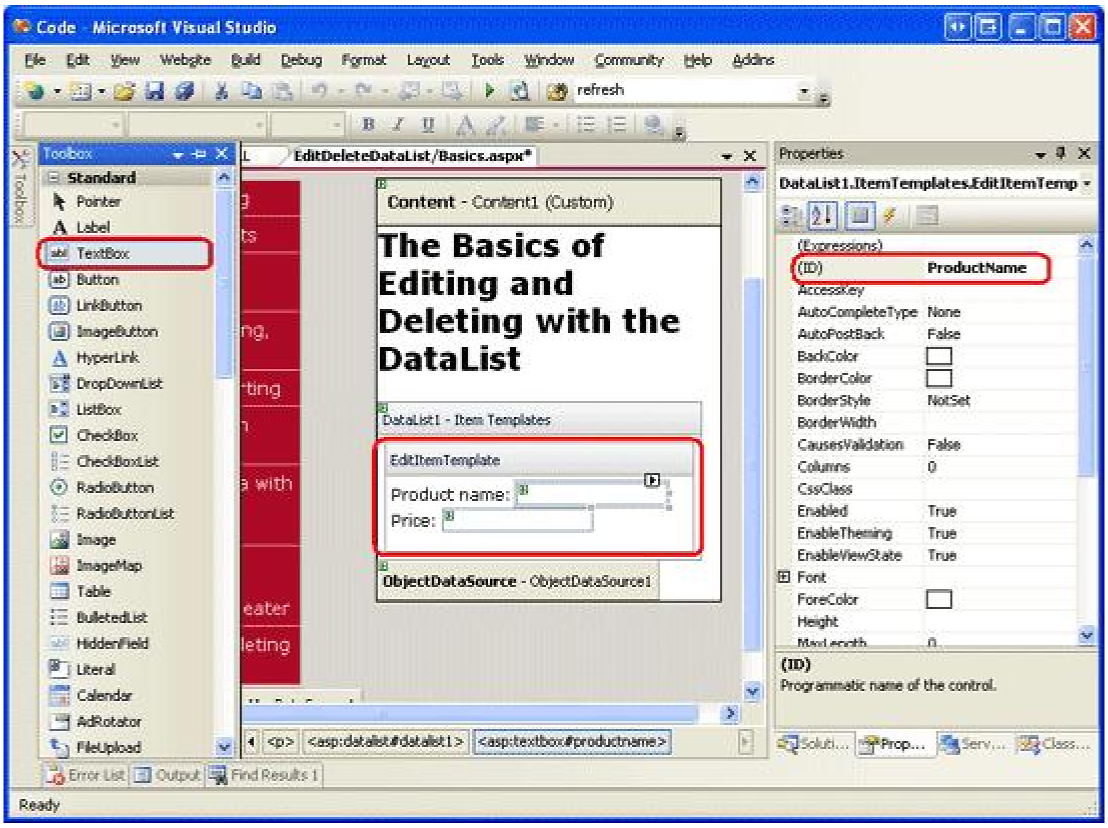

Code - Microsoft Visual Studio
File Edit View Website Build Debug Format Layout Tools Window Community Help Addins
App_Code/BLL/ProductsBLL
EditDeleteDataList/Basics.aspx
Working with Data Tutorials
Root Node > Parent Node > Current Node
Home
Basic Reporting
Filtering Reports
Customized Formatting
Editing, Inserting, and Deleting
Paging and Sorting
Adding Custom Buttons
Displaying Data with the DataList and Repeater
Master/Detail Reports with the
Content - Content1 (Custom)
The Basics of Editing and Deleting with the DataList
DataList1 - Item Templates
EditItemTemplate
ObjectDataSource - ObjectDataSource1
DataList Tasks
Template Editing Mode
Display: EditItemTemplate
Item Templates
ItemTemplate
AlternatingItemTemplate
SelectedItemTemplate
EditItemTemplate
Header and Footer Templates
HeaderTemplate
FooterTemplate
Separator Template
Design
Source
<body> <asp:content#content1> <p> <asp:datalist#datalist1>
Error List
Output
Find Results 1
Ready

Figure 8: Opt to Work with the DataList's `EditItemTemplate`

Next, type in "Product name:" and "Price:" and then drag two TextBox controls from the Toolbox into the `EditItemTemplate` interface on the Designer. Set the TextBoxes' `ID` properties to `ProductName` and `UnitPrice`.



Content - Content1 (Custom)

The Basics of Editing and Deleting with the DataList

DataList1 - Item Templates

EditItemTemplate

Product name:

Price:

ObjectDataSource - ObjectDataSource1

`<p> <asp:datalist#datalist1> <asp:textbox#productname>`

DataList1.ItemTemplates.EditItemTemp

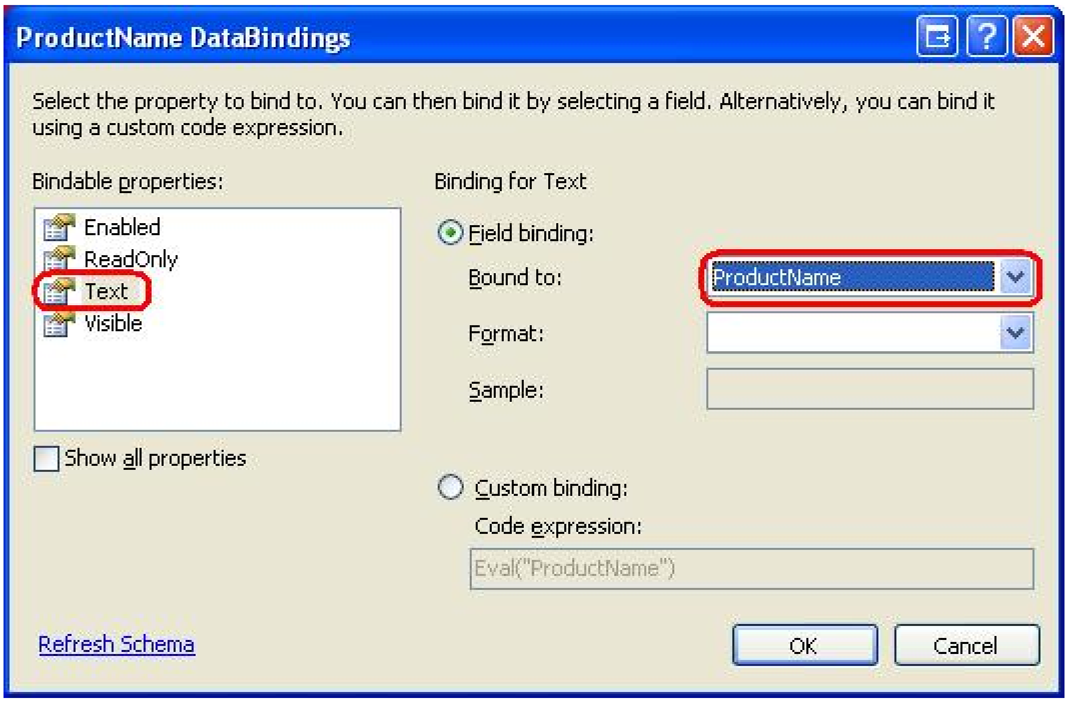
(Expressions)	
(ID)	ProductName
AccessKey	
AutoCompleteType	None
AutoPostBack	False
BackColor	
BorderColor	
BorderStyle	NotSet
BorderWidth	
CausesValidation	False
Columns	0
CssClass	
Enabled	True
EnableTheming	True
EnableViewState	True
Font	
ForeColor	
Height	
MaxLength	0

(ID)
Programmatic name of the control.

Figure 9: Add a TextBox for the Product's Name and Price

We need to bind the corresponding product data field values to the `Text` properties of the two TextBoxes. From the TextBoxes' smart tags, click on the Edit DataBindings link and then associate the appropriate data field with the `Text` property, as shown in Figure 10.

Note: When binding the `UnitPrice` data field to the price TextBox's `Text` field, you may format it as a currency value (`{0:C}`), a general number (`{0:N}`), or leave it unformatted.


ProductName DataBindings

Select the property to bind to. You can then bind it by selecting a field. Alternatively, you can bind it using a custom code expression.

Bindable properties:
- Enabled
- ReadOnly
- Text
- Visible

☐ Show all properties

Binding for Text

◉ Field binding:

Bound to: ProductName

Format:

Sample:

○ Custom binding:

Code expression: Eval("ProductName")

Figure 10: Bind the `ProductName` and `UnitPrice` Data Fields to the `Text` Properties of the TextBoxes

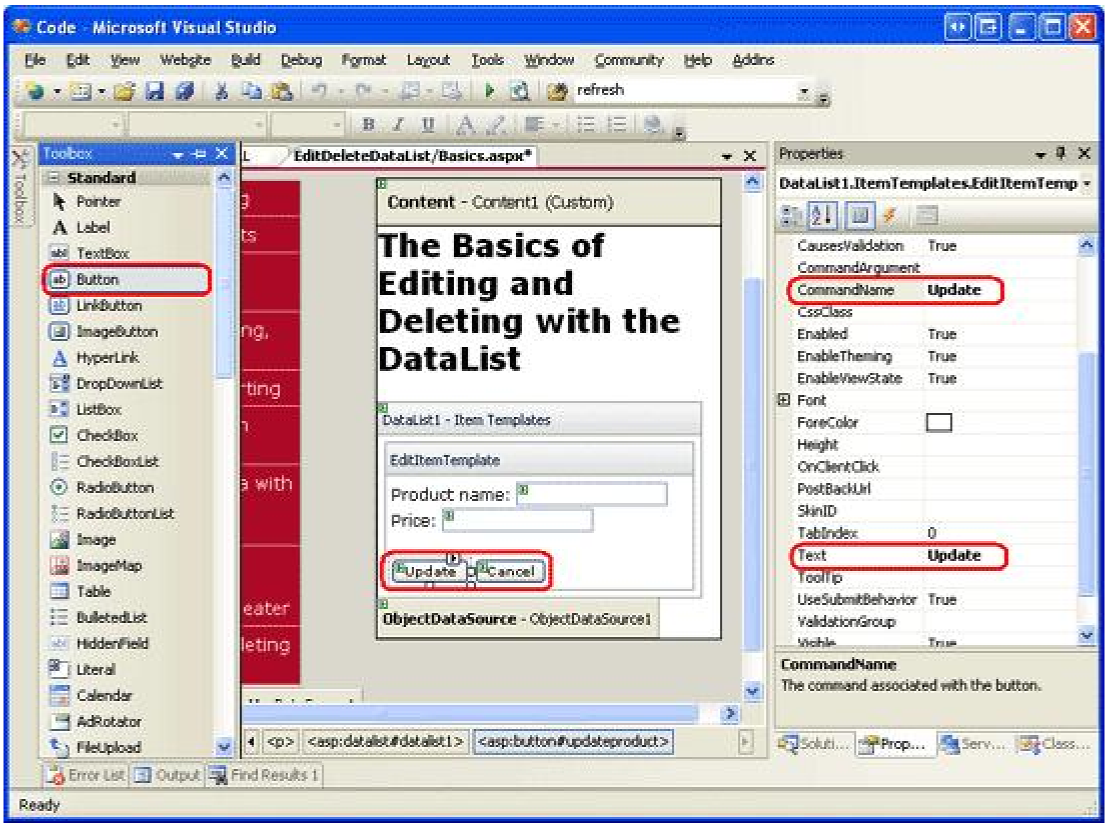
Notice how the Edit DataBindings dialog box in Figure 10 does *not* include the "Two-way databinding" checkbox that is present when editing a TemplateField in the GridView or DetailsView, or a template in the FormView. The two-way databinding feature allowed the value entered into the input Web control to be automatically assigned to the corresponding ObjectDataSource's `InsertParameters` or `UpdateParameters` when inserting or updating data. The DataList does not support two-way databinding — as we'll see later on in this tutorial, after the user makes her changes and is ready to update the data, we will need to programmatically access these TextBoxes' `Text` properties and pass in their values to the appropriate `UpdateProduct` method in the `ProductsBLL` class.

Finally, we need to add Update and Cancel buttons to the `EditItemTemplate`. As we saw in the Master/Detail Using a Bulleted List of Master Records with a Details DataList tutorial, when a Button, LinkButton, or ImageButton whose `CommandName` property is set is clicked from within a Repeater or DataList, the Repeater or DataList's `ItemCommand` event is raised. For the DataList, if the `CommandName` property is set to a certain value, an additional event may be raised as well. The special `CommandName` property values include, among others:

- "Cancel" — raises the `CancelCommand` event
- "Edit" — raises the `EditCommand` event
- "Update" — raises the `UpdateCommand` event

Keep in mind that these events are raised *in addition to* the `ItemCommand` event.

Add to the `EditItemTemplate` two Button Web controls, one whose `CommandName` is set to "Update" and the other's set to "Cancel". After adding these two Button Web controls the Designer should look similar to the following:


Code - Microsoft Visual Studio
File Edit View Website Build Debug Format Layout Tools Window Community Help Addins
refresh
Toolbox
Standard
Pointer
Label
TextBox
Button
LinkButton
ImageButton
HyperLink
DropDownList
ListBox
CheckBox
CheckBoxList
RadioButton
RadioButtonList
Image
ImageMap
Table
BulletedList
HiddenField
Literal
Calendar
AdRotator
FileUpload
EditDeleteDataList/Basics.aspx*
Content - Content1 (Custom)
The Basics of Editing and Deleting with the DataList
DataList1 - Item Templates
EditItemTemplate
Product name:
Price:
Update
Cancel
ObjectDataSource - ObjectDataSource1
<p> <asp:datalist#datalist1> <asp:button#updateproduct>
Properties
DataList1.ItemTemplates.EditItemTemp
CommandName
The command associated with the button.
Error List
Output
Find Results 1
Ready

CausesValidation	True
CommandArgument	
CommandName	Update
CssClass	
Enabled	True
EnableTheming	True
EnableViewState	True
Font	
ForeColor	
Height	
OnClientClick	
PostBackUrl	
SkinID	
TabIndex	0
Text	Update
ToolTip	
UseSubmitBehavior	True
ValidationGroup	
Visible	True

Figure 11: Add Update and Cancel Buttons to the `EditItemTemplate`

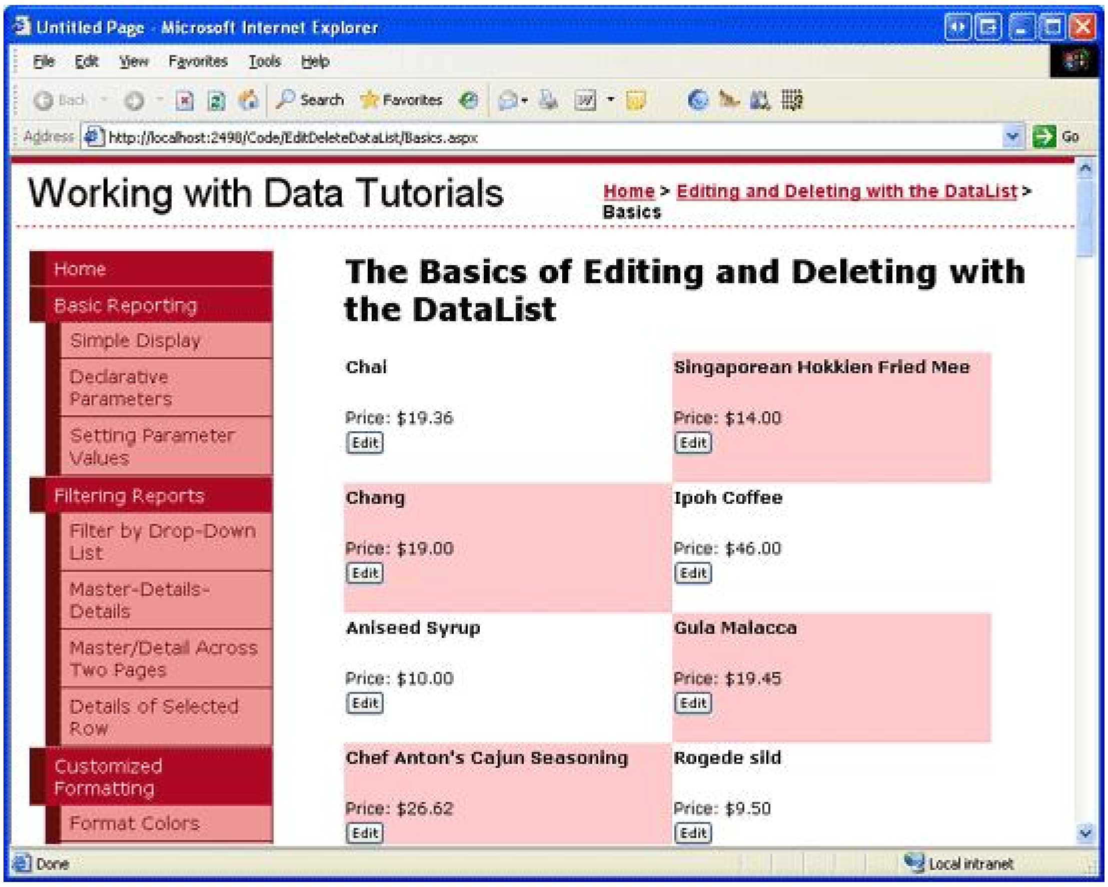
With the `EditItemTemplate` complete your DataList's declarative markup should look similar to the following:

```
<asp:DataList ID="DataList1" runat="server" DataKeyField="ProductID"
    DataSourceID="ObjectDataSource1" RepeatColumns="2">
    <ItemTemplate>
        <h5>
            <asp:Label runat="server" ID="ProductNameLabel"
                Text='<%# Eval("ProductName") %>' />
        </h5>
        Price: <asp:Label runat="server" ID="Label1"
                    Text='<%# Eval("UnitPrice", "{0:C}") %>' />
        <br />
        <br />
    </ItemTemplate>
    <EditItemTemplate>
        Product name:
            <asp:TextBox ID="ProductName" runat="server"
                Text='<%# Eval("ProductName") %>' /><br />
        Price:
            <asp:TextBox ID="UnitPrice" runat="server"
                Text='<%# Eval("UnitPrice", "{0:C}") %>' /><br />
        <br />
        <asp:Button ID="UpdateProduct" runat="server"
            CommandName="Update" Text="Update" />
        <asp:Button ID="CancelUpdate" runat="server"
            CommandName="Cancel" Text="Cancel" />
    </EditItemTemplate>
</asp:DataList>
```

Step 5: Adding the Plumbing to Enter Edit Mode

At this point our DataList has an editing interface defined via its `EditItemTemplate`; however, there’s currently no way for a user visiting our page to indicate that he wants to edit a product’s information. We need to add an Edit button to each product that, when clicked, renders that DataList item in edit mode. Start by adding an Edit button to the `ItemTemplate`, either through the Designer or declaratively. Be certain to set the Edit button’s `CommandName` property to “Edit”.

After you have added this Edit button, take a moment to view the page through a browser. With this addition, each product listing should include an Edit button.


Untitled Page - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://localhost:2498/Code/EditDeleteDataList/Basics.aspx
Go
Working with Data Tutorials
Home > Editing and Deleting with the DataList > Basics
Home
Basic Reporting
Simple Display
Declarative Parameters
Setting Parameter Values
Filtering Reports
Filter by Drop-Down List
Master-Details-Details
Master/Detail Across Two Pages
Details of Selected Row
Customized Formatting
Format Colors
Done
Local intranet

The Basics of Editing and Deleting with the DataList

Chai

Price: $19.36

Edit

Singaporean Hokkien Fried Mee

Price: $14.00

Edit

Chang

Price: $19.00

Edit

Ipoh Coffee

Price: $46.00

Edit

Aniseed Syrup

Price: $10.00

Edit

Gula Malacca

Price: $19.45

Edit

Chef Anton's Cajun Seasoning

Price: $26.62

Edit

Rogede sild

Price: $9.50

Edit

Figure 12: Add Update and Cancel Buttons to the `EditItemTemplate`

Clicking the button causes a postback, but does *not* bring the product listing into edit mode. To make the product editable, we need to:

1. Set the DataList's `EditItemIndex` property to the index of the `DataListItem` whose Edit button was just clicked.
2. Rebind the data to the DataList. When the DataList is re-rendered, the `DataListItem` whose `ItemIndex` corresponds with the DataList's `EditItemIndex` will render using its `EditItemTemplate`.

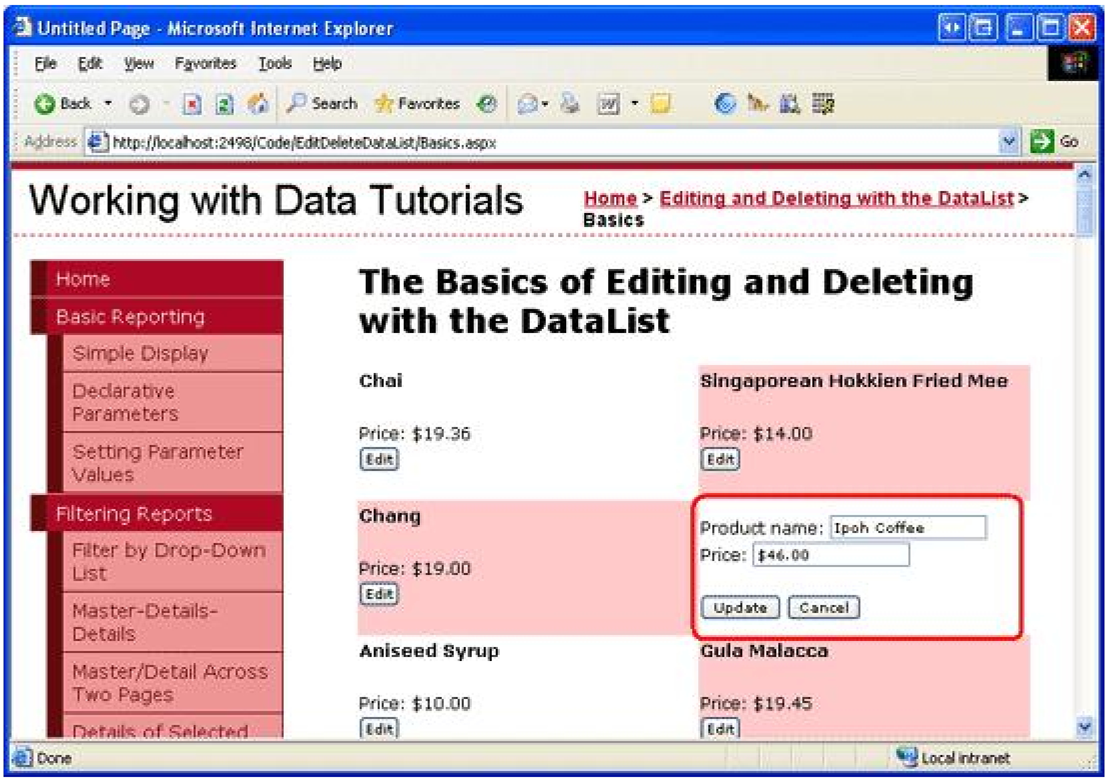
Since the DataList's `EditCommand` event is fired when the Edit button is clicked, create an `EditCommand` event handler with the following code:

```
protected void DataList1_EditCommand(object source, DataListCommandEventArgs e)
{
    // Set the DataList's EditItemIndex property to the
    // index of the DataListItem that was clicked
    DataList1.EditItemIndex = e.Item.ItemIndex;

    // Rebind the data to the DataList
    DataList1.DataBind();
}
```

The `EditCommand` event handler is passed in an object of type `DataListCommandEventArgs` as its second input parameter, which includes a reference to the `DataListItem` whose Edit button was clicked (`e.Item`). The event handler first sets the DataList's `EditItemIndex` to the `ItemIndex` of the editable `DataListItem` and then rebinds the data to the DataList by calling the DataList's `DataBind()` method.

After adding this event handler, revisit the page in a browser. Clicking the Edit button now makes the clicked product editable (see Figure 13).


Untitled Page - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Search Favorites
Address http://localhost:2498/Code/EditDeleteDataList/Basics.aspx
Go
Working with Data Tutorials
Home > Editing and Deleting with the DataList > Basics
Home
Basic Reporting
Simple Display
Declarative Parameters
Setting Parameter Values
Filtering Reports
Filter by Drop-Down List
Master-Details-Details
Master/Detail Across Two Pages
Details of Selected
Done
Local intranet

The Basics of Editing and Deleting with the DataList

Chai
Price: $19.36
Edit

Singaporean Hokkien Fried Mee
Price: $14.00
Edit

Chang
Price: $19.00
Edit

Product name: Ipoh Coffee
Price: $46.00
Update Cancel

Aniseed Syrup
Price: $10.00
Edit

Gula Malacca
Price: $19.45
Edit

Figure 13: Clicking the Edit Button Makes the Product Editable

Step 6: Saving the User's Changes

Clicking the edited product's Update or Cancel buttons does nothing at this point; to add this functionality we need to create event handlers for the DataList's `UpdateCommand` and `CancelCommand` events. Start by creating the `CancelCommand` event handler, which will execute when the edited product's Cancel button is clicked and it tasked with returning the DataList to its pre-editing state.

To have the DataList render all of its items in the read-only mode, we need to:

1. Set the DataList's `EditItemIndex` property to the index of a non-existent `DataListItem` index. `-1` is a safe choice, since the `DataListItem` indexes start at `0`.
2. Rebind the data to the DataList. Since no `DataListItem` `ItemIndex`es correspond to the DataList's `EditItemIndex`, the entire DataList will be rendered in a read-only mode.

These steps can be accomplished with the following event handler code:

```
protected void DataList1_CancelCommand(object source, DataListCommandEventArgs e)
{
    // Set the DataList's EditItemIndex property to -1
    DataList1.EditItemIndex = -1;

    // Rebind the data to the DataList
    DataList1.DataBind();
}
```

With this addition, clicking the Cancel button returns the DataList to its pre-editing state.

The last event handler we need to complete is the `UpdateCommand` event handler. This event handler needs to:

1. Programmatically access the user-entered product name and price as well as the edited product's `ProductID`.

2. Initiate the update process by calling the appropriate `UpdateProduct` overload in the `ProductsBLL` class.
3. Set the DataList's [`EditItemIndex` property]() to the index of a non-existent `DataListItem` index. `-1` is a safe choice, since the `DataListItem` indexes start at `0`.
4. Rebind the data to the DataList. Since no `DataListItem` `ItemIndex`es correspond to the DataList's `EditItemIndex`, the entire DataList will be rendered in a read-only mode.

Steps 1 and 2 are responsible for saving the user's changes; steps 3 and 4 return the DataList to its pre-editing state after the changes have been saved and are identical to the steps performed in the `CancelCommand` event handler.

To get the updated product name and price, we need to use the `FindControl` method to programmatically reference the TextBox Web controls within the `EditItemTemplate`. We also need to get the edited product's `ProductID` value. When we initially bound the ObjectDataSource to the DataList, Visual Studio assigned the DataList's `DataKeyField` property to the primary key value from the data source (`ProductID`). This value can then be retrieved from the DataList's `DataKeys` collection. Take a moment to ensure that the `DataKeyField` property is indeed set to `ProductID`.

The following code implements the four steps:

```
protected void DataList1_UpdateCommand(object source, DataListCommandEventArgs e)
{
    // Read in the ProductID from the DataKeys collection
    int productID = Convert.ToInt32(DataList1.DataKeys[e.Item.ItemIndex]);

    // Read in the product name and price values
    TextBox productName = (TextBox)e.Item.FindControl("ProductName");
    TextBox unitPrice = (TextBox)e.Item.FindControl("UnitPrice");

    string productNameValue = null;
    if (productName.Text.Trim().Length > 0)
        productNameValue = productName.Text.Trim();

    decimal? unitPriceValue = null;
    if (unitPrice.Text.Trim().Length > 0)
        unitPriceValue = Decimal.Parse(unitPrice.Text.Trim(),
            System.Globalization.NumberStyles.Currency);

    // Call the ProductsBLL's UpdateProduct method...
    ProductsBLL productsAPI = new ProductsBLL();
    productsAPI.UpdateProduct(productNameValue, unitPriceValue, productID);


    // Revert the DataList back to its pre-editing state
    DataList1.EditItemIndex = -1;
    DataList1.DataBind();
}
```

The event handler starts by reading in the edited product's `ProductID` from the `DataKeys` collection. Next, the two TextBoxes in the `EditItemTemplate` are referenced and their `Text` properties stored in local variables, `productNameValue` and `unitPriceValue`. We use the `Decimal.Parse()` method to read the value from the `UnitPrice` TextBox so that if the value entered has a currency symbol, it can still be correctly converted into a `Decimal` value.

Note: The values from the `ProductName` and `UnitPrice` TextBoxes are only assigned to the productNameValue and unitPriceValue variables if the TextBoxes' Text properties have a value specified. Otherwise, a value of `Nothing` is used for the variables, which has the effect of updating the data with a database `NULL` value. That is, our code treats converts empty strings to database `NULL` values, which is the default behavior of the editing interface in the GridView, DetailsView, and FormView controls.

After reading the values, the `ProductsBLL` class's `UpdateProduct` method is called, passing in the product's name, price, and `ProductID`. The event handler completes by returning the DataList to its pre-editing state using the exact same logic as in the `CancelCommand` event handler.

With the `EditCommand`, `CancelCommand`, and `UpdateCommand` event handlers complete, a visitor can edit the name and price of a product. Figures 14-16 show this editing workflow in action.

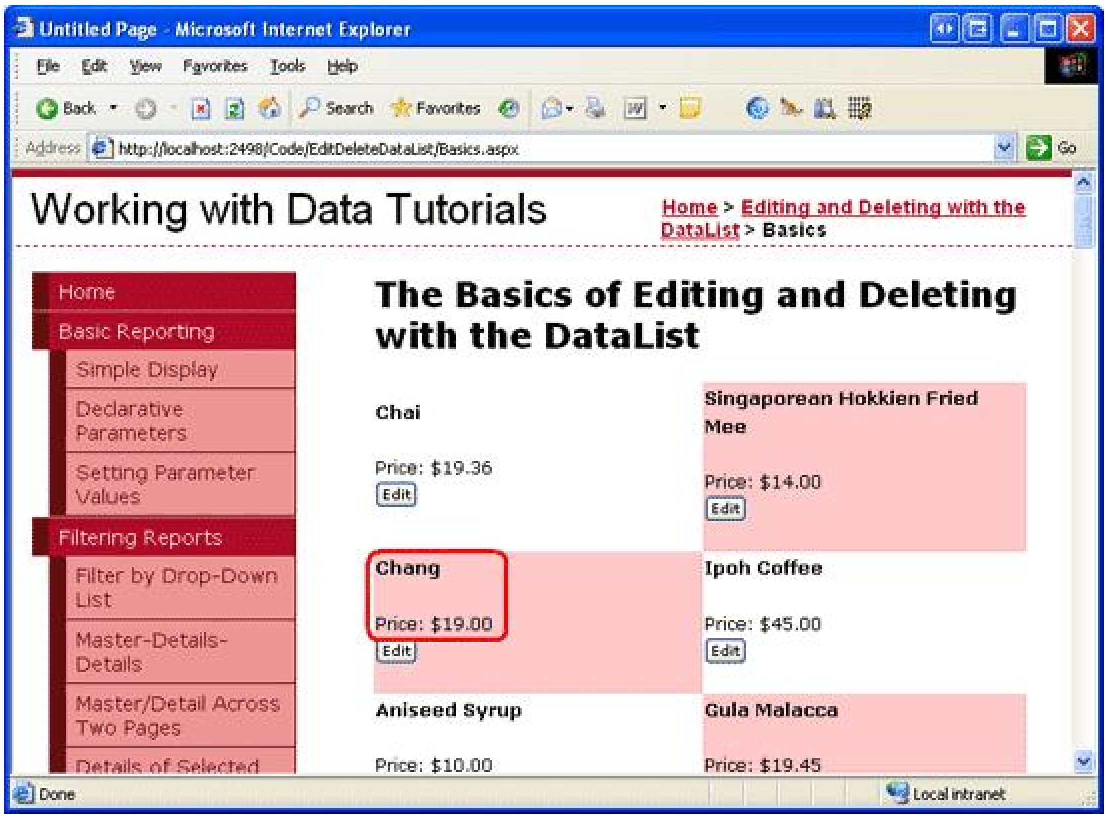


Figure 14: When First Visiting the Page, All Products are in Read-Only Mode

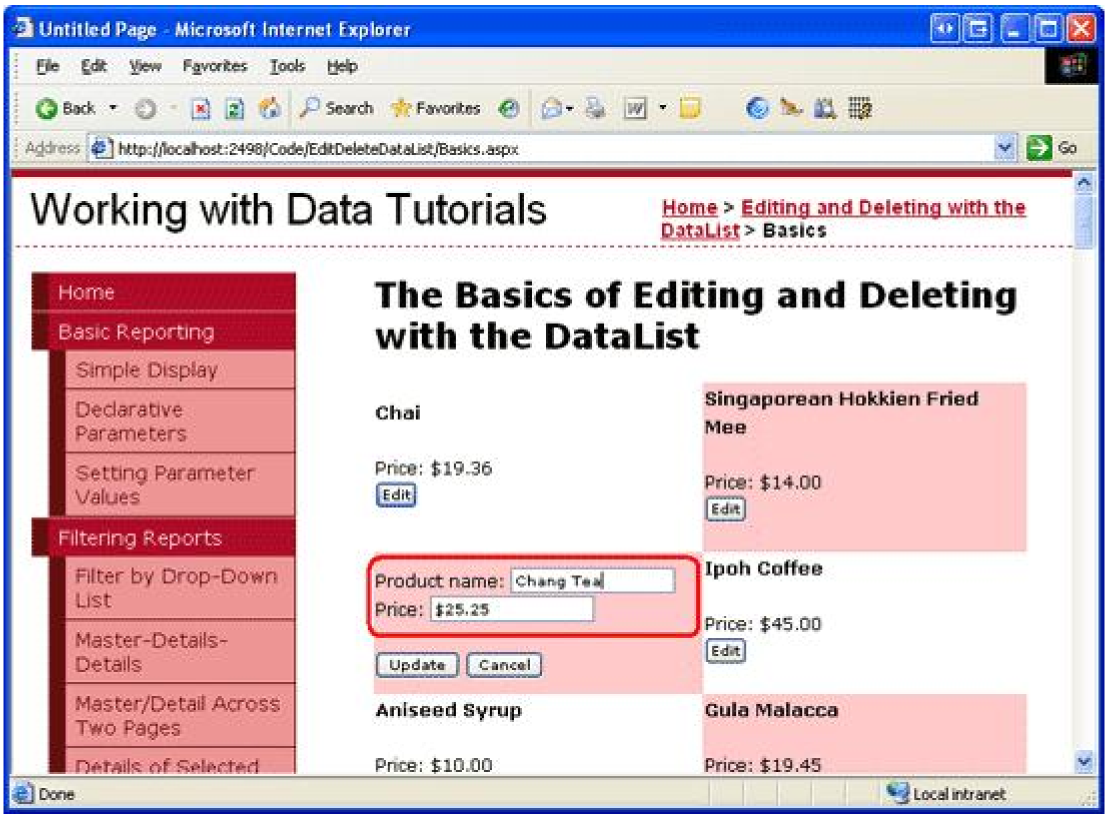

Untitled Page - Microsoft Internet Explorer
http://localhost:2498/Code/EditDeleteDataList/Basics.aspx
Working with Data Tutorials
Home > Editing and Deleting with the DataList > Basics
The Basics of Editing and Deleting with the DataList
Chai
Price: $19.36
Edit
Singaporean Hokkien Fried Mee
Price: $14.00
Edit
Product name: Chang Tea
Price: $25.25
Update
Cancel
Ipoh Coffee
Price: $45.00
Edit
Aniseed Syrup
Price: $10.00
Gula Malacca
Price: $19.45
Done
Local intranet

Figure 15: To Update a Product's Name or Price, Click the Edit Button

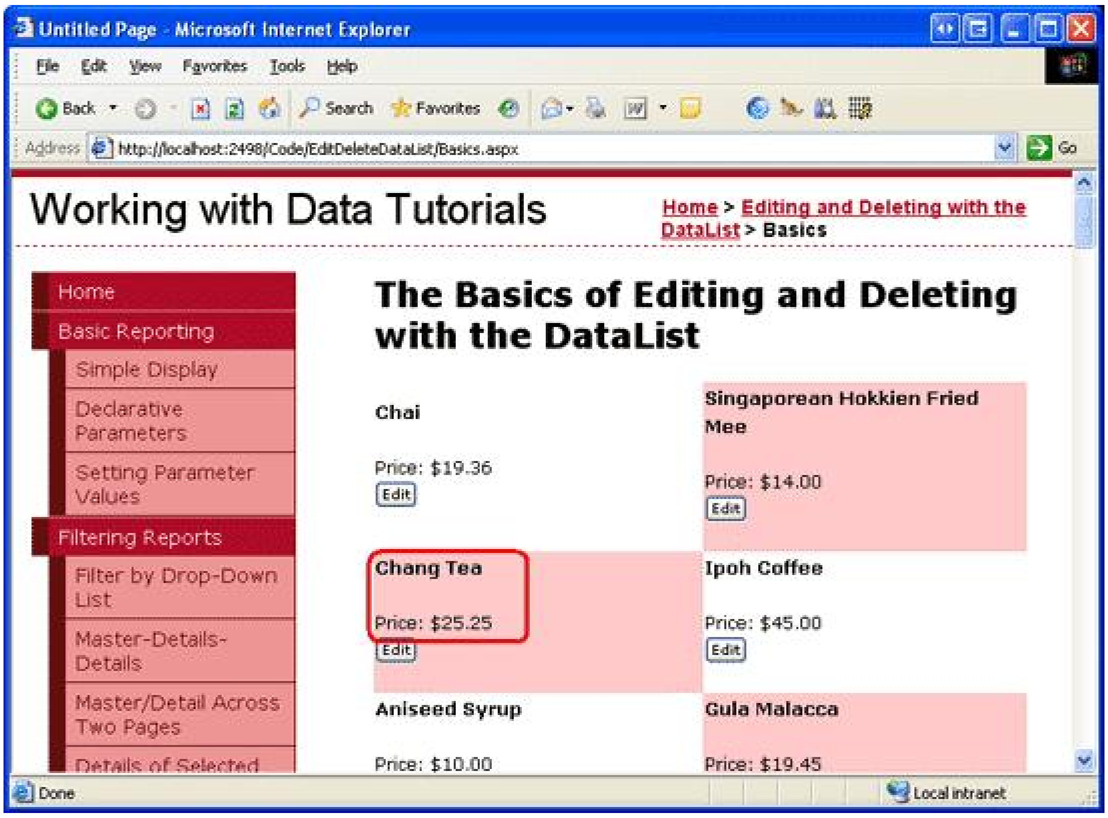


Figure 16: After Changing the Value, Click Update to Return to the Read-Only Mode

Step 7: Adding Delete Capabilities

The steps for adding delete capabilities to a DataList are similar to those for adding editing capabilities. In short, we need to add a Delete button to the `ItemTemplate` that, when clicked:

1. Reads in the corresponding product's `ProductID` via the `DataKeys` collection.
2. Performs the delete by calling the `ProductsBLL` class's `DeleteProduct` method.
3. Rebinds the data to the DataList.

Let's start by adding a Delete button to the `ItemTemplate`.

When clicked, a Button whose `CommandName` is "Edit", "Update", or "Cancel" raises the DataList's `ItemCommand` event along with an additional event (for example, when using "Edit" the `EditCommand` event is raised as well). Similarly, any Button, LinkButton, or ImageButton in the DataList whose `CommandName` property is set to "Delete" causes the `DeleteCommand` event to fire (along with `ItemCommand`).

Add a Delete button next to the Edit button in the `ItemTemplate`, setting its `CommandName` property to "Delete". After adding this Button control your DataList's `ItemTemplate` declarative syntax should look like:

```
<ItemTemplate>
    <h5>
        <asp:Label runat="server" ID="ProductNameLabel"
            Text='<%# Eval("ProductName") %>' />
    </h5>
    Price: <asp:Label runat="server" ID="Label1"
                Text='<%# Eval("UnitPrice", "{0:C}") %>' />
    <br />
    <asp:Button runat="server" id="EditProduct" CommandName="Edit"
        Text="Edit" />
    <asp:Button runat="server" id="DeleteProduct" CommandName="Delete"
        Text="Delete" />
    <br />
    <br />
</ItemTemplate>
```

Next, create an event handler for the DataList's `DeleteCommand` event, using the following code:

```
protected void DataList1_DeleteCommand(object source, DataListCommandEventArgs e)
{
    // Read in the ProductID from the DataKeys collection
    int productID = Convert.ToInt32(DataList1.DataKeys[e.Item.ItemIndex]);

    // Delete the data
    ProductsBLL productsAPI = new ProductsBLL();
    productsAPI.DeleteProduct(productID);

    // Rebind the data to the DataList
    DataList1.DataBind();
}
```

Clicking the Delete button causes a postback and fires the DataList's `DeleteCommand` event. In the event handler, the clicked product's `ProductID` value is accessed from the `DataKeys` collection. Next, the product is deleted by calling the `ProductsBLL` class's `DeleteProduct` method.

After deleting the product, it's important that we rebind the data to the DataList (`DataList1.DataBind()`), otherwise the DataList will continue to show the product that was just deleted.

Summary

While the DataList lacks the point and click editing and deleting support enjoyed by the GridView, with a short bit of code it can be enhanced to include these features. In this tutorial we saw how to create a two-column listing of products that could be deleted and whose name and price could be edited. Adding editing and deleting support is a matter of including the appropriate Web controls in the `ItemTemplate` and `EditItemTemplate`, creating the corresponding event handlers, reading the user-entered and primary key values, and interfacing with the Business Logic Layer.

While we have added basic editing and deleting capabilities to the DataList, it lacks more advanced features. For example, there is no input field validation - if a user enters a price of "Too expensive," an exception will be thrown by `Decimal.Parse` when attempting to convert "Too expensive" into a `Decimal`. Similarly, if there is a problem in updating the data at the Business Logic or Data Access Layers the user will be presented with the standard error screen. Without any sort of confirmation on the Delete button, accidentally deleting a product is all too likely.

In future tutorials we'll see how to improve the editing user experience.

Happy Programming!

About the Author

Scott Mitchell, author of six ASP/ASP.NET books and founder of 4GuysFromRolla.com, has been working with Microsoft Web technologies since 1998. Scott works as an independent consultant, trainer, and writer, recently completing his latest book, Sams Teach Yourself ASP.NET 2.0 in 24 Hours. He can be reached at mitchell@4guysfromrolla.com or via his blog, which can be found at ScottOnWriting.NET.

Special Thanks To…

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