



GETTING STARTED WITH CODE ON TIME

Got data? Generate modern web apps in minutes. Learn to create sophisticated web apps with Code On Time application generator for ASP.NET, Azure, DotNetNuke, and SharePoint.

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Creating "Code" Business Rule to Handle the Action

Creating an App

Let's create a new Web Site Factory project.

Start Code On Time web application generator and select Web Site Factory under New Project.

🕑 Welcome - Code On Time		x
	***	^
Activation		
	Senerator for Microsoft.NET. A collection of code generation projects is included. equire an activation code. Register your activation code.	
My Projects		
	ect in the library below. The project wizard will guide you through a series of pages to gather te an application code of the selected project type. Some of the project features require a activation	
New Project		
S Azure Factory	Create an Azure Cloud solution from your SQL Azure database. Includes a Web Role and class library implementing a web site with navigation system, role-based security, membership manager, built-in data export, reporting, and much more. Have it online in 15 minutes.	
🕸 DotNetNuke Factory	Create application pages as controls with data views incorporated in a DotNetNuke module. Registered module can be configured by end users. Integrate a line-of-business database application with a popular open source web content management system in minutes.	
parePoint Factory	Create a collection of application pages implemented as user controls; package them for deployment as Microsoft SharePoint 2010 Feature with a single Web Part. Integrate a line-of- business database application with a widely adopted corporate web content management system.	
👔 Web App Factory	Create an ASP.NET/AJAX solution composed of a web application project and class library implementing a web site with navigation system, role-based security, membership manager, built- in data export and reporting, adaptive filtering, advanced search options, and much more.	
B Web Site Factory	Create an ASP.NET/AJAX web site with navigation system, role-based security, membership manager, built-in data export and reporting, adaptive filtering, advanced search options, and much more. The generated project is managed via the file system folder structure.	
 We recommend creating we required. 	e a "Web Site Factory" project a group of the using Code On Time . No additional software is	
Learn to develop web applic		
Use free Microsoft Visual We	b Developer Express to further customize generated projects when needed.	-
© 2012 Code OnTime LLC. All rig	hts reserved. Version 7.0.1.0.	

The next page will prompt to specify a name and programming language of the project.

Select the programming language of your choice and specify the following name:

Property	Value
Name	MyProject1

🕒 Create Project - Code On Time 📃 💻 💷
Please enter the project name and click the <i>Create</i> button.
New Project
Vendor: Code OnTime LLC http://www.codeontime.com
Web Site Factory Create an ASP.NET/AJAX web site with navigation system, role-based security, membership manager, built-in data export and reporting, adaptive filtering, advanced search options, and much more. The generated project is managed via the file system folder structure. Review a complete feature list of this project. Try a live demo now. Name: MyProject1 Language: C#
Create Cancel
© 2012 Code OnTime LLC. All rights reserved. Version 7.0.1.0.

Press Create button to create the project.

The next page allows changing the *Namespace* and the version of *Microsoft*.*NET Framework*. Leave the default values and press *Next*.

(2) MyProject1 / Namespace and Framework - Code On Time	
	*
You are about to generate an ASP.NET/AJAX project Web Site Factory.	
About This Project	
Data Aquarium Framework is in the foundation of this web site project. The project includes a collection of code files, a single web service, and a few JavaScript components. The framework relies on XML data controller descriptors that combine SQL queries, data fields, views, and actions to render an advanced AJAX-powered presentation.	
A web site will incorporate the entire framework source code without any external dependencies. All images, JavaScript files, cascading stylesheets, and data controller descriptor files are included.	
Generated web site will include pages with data controller views. You can place custom user controls on the pages of your web application and perform any imaginable arrangement of application pages and navigation system.	
Review a complete feature matrix of our products.	
Try live demo projects and see AJAX magic in action.	
Namespace and Framework	
C# is the programming language of this project. The application framework code will be implemented in a custom namespace. Namespace:	
MyCompany	
The same identifier will be also used to name the web application theme and the connection string in the configuration file.	
Framework:	
.NET Framework 4.0 🔻	
Cancel	÷
8/28/2012 2:29:08 PM test passed 8/28/2012 2:29:08 PM copy input="[Documents]\Visual Studio 2010\Projects\Code OnTime LLC\CodeOnTime\Code OnTime Library \Data Aquarium\DataAquarium.Project.xml" output="DataAquarium.Project.xml"	•
8/28/2012 2:29:08 PM end if 8/28/2012 2:29:08 PM navigate url="\Data Aquarium\DataAquarium.Start.htm?splash=WebSiteFactory"	Ŧ

This page allows specifying the Data Provider and Connection String. Select your data provider from the list.

This tutorial uses *Microsoft SQL Server* database engine. If you do not have a database server, consider installing Microsoft SQL Server 2012 Express.

Click on the button to the right of the *Connection String* field to open the *Connection String Configuration* page.

Please specify a database connection string for this project. Database Connection
A valid connection string compatible with the selected data provider is required to generate the project. Data controller descriptors are automatically built from your database and are easy to maintain with the provided XML schemas.
Data Provider:
.Net Framework Provider for SqlServer (System.Data.SqlClient)
Connection String:
All database tables and views are included in this project. Change Configure database connection string and install database features.

If you have SQL Server Express edition, specify the following:

Property	Value
Server	.\SQLEXPRESS
Database	Northwind
Sample Tables	Northwind

To the right of *Database* field, click on the *Create* button and confirm to create the database.

Server:	
.\SQLEXPRESS	
Windows authentication	
SQL Server authentication	
User name:	
Password:	
Database:	
Northwind	Create
Confirm	ind' on the specified database server?
	Yes No

To the right of the *Sample Tables* dropdown, press *Install* and confirm to populate the project database with the *Northwind* dataset.

Server:	
.\SQLEXPRESS	
 Windows authentication 	
SQL Server authentication	Sample Database
User name:	
Password:	
Database:	Install "02 Northwind" sample?
Northwind	
Sample Tables:	
You can popluate the application database with Northwind Install	Yes No

Code On Time does not offer tools to design databases. Use your favorite database management tools, such as *Microsoft SQL Server Management Studio*, to work with the database schema.

Our application will have built-in user and role management system. Code On Time applications rely on the security infrastructure available in ASP.NET.

Under *Membership* section, press *Add* and confirm to add *ASP.NET Membership* to the database.

	on can be configured to implement <i>user and role manager</i> based on Microsoft ASP.NET Membersh limited edition then you may consider implementing custom membership and role providers instea Add Remove
Message	from webpage
?	Click OK to create tables and stored procedures required to support ASP.NET Membership and Role Manager in the database.
	OK Cancel

You will see a confirmation when the membership has been configured.

Press OK to finish configuration of the database connection string.

O MyProject1 / SQL Server Connection - Code On Time
Please specify SQL Server name and database.
SQL Server Connection
Server:
.\\$QLEXPRESS
Windows authentication
SQL Server authentication
User name:
Password:
Database:
Northwind Create
Sample Tables:
You can popluate the application database with sample tables.
Northwind Install Uninstall Learn more about this sample.
Membership: Your application can be configured to implement <i>user and role manager</i> based on Microsoft ASP.NET
Membership. If you own Unlimited edition then you may consider implementing custom membership and role providers
instead.
Status Add Remove
Test OK Cancel
8/31/2012 11:58:34 AM =======

If you are using a trial version of the application generator, the project size is limited to 10 tables or views. To select a subset of tables for the project, click the *Change* button next to "All database tables and views are included in this project". Include the following tables: *Categories, Customers, Employees, EmployeeTerritories, Order Details, Orders, Products, Shippers, Suppliers,* and *Territories.*

Please specify a database connection string for this project.	
Database Connection	
A valid connection string compatible with the selected data p with the provided XML schemas. Data Provider:	provider is required to generate the project.
.Net Framework Provider for SqlServer (System.Data.SqlC	Client) 🗸
Connection String:	
Data Source=;Initial Catalog=Northwind;Integrated Secur	ity=True;
All database tables and views are included in this Database Object Filter	project. Change
Tables / Views	10 objects selected
 dbo.Alphabetical list of products dbo.Categories dbo.Category Sales for 1997 dbo.Current Product List dbo.Customer and Suppliers by City dbo.CustomerCustomerDemo 	OK Cancel

Press Next twice to reach the Reporting configuration page. Enable dynamic and static reports in the application.

Please specify your reporting preferences.
Reporting
Support for Microsoft Reporting Services technology can be embedded into your application. Dynamic reports are automatically created on-the-fly without a need for a standalone reporting server. Static reports are supported as well.
Application users will be able to render reports as Adobe PDF, Microsoft Office Excel, or Tiffimage file.
The Microsoft report viewer is required to run the reports. The <i>Microsoft Report Viewer Redistributable Package</i> includes Windows Forms and ASP.NET Web server controls for viewing reports designed using Microsoft reporting technology.
 Download the redistributable report viewer package for Microsoft.NET 3.5. Download the redistributable report viewer package for Microsoft.NET 4.0.
Attention: If you have Microsoft Visual Studio 2008/2010 installed on your computer then the viewer is likely installed already. Users of Visual Web Developer Express 2008/2010 will have to install the report viewer if reports are enabled for this project.
You have to install the viewer on the server machine when the generated application is deployed. Reports: Enable dynamic and static reports in my application.

Hold down *Shift* key and press *Next* – this will skip directly to the *Summary* page. Press the *Generate* button to start creation of the web application.



When generation is complete, the web site will open in your default browser.

+ Mitp://localhost:43526/Pages/Home.aspx	· ☆ ★ A × 5 図 + Q
🤗 Start 🛛 🗙 🔛	
	Login to this website Help ^
	User Name:
MyCompany	Password:
Home	Remember me next time
Home > Home	Forgot your password?
Start	Sign up now
Please select a page link in the table of contents below.	Sign in to access
Site Map	Instructions
Home	Two standard user accounts are automatically created when application is initialized if membership option has been selected for this application.
	The administrative account admin is authorized to access all areas of the web site and membership manager. The standard user account is allowed to access all areas of the web site with the exception of membership manager.
	Move the mouse pointer over the link <i>Login to this web site</i> on the right-hand side at the top of the page and sign in with one of the accounts listed below.
	Administrative account: admin / admin123%
	Standard user account: user / user123%
© 2012 MyCompany. All rights reserved.	-

Using the Project Designer

The Project Designer allows customizing the pages and data controllers of the web application.

To activate the *Project Designer*, click on a project name on the start page of the application generator.

My Pr	ojects			
This is the list of the projects that you have created. Click on the project name to open and generate the project one more time. Note that most projects will automatically backup the previous version of the source code prior to generating and overwriting the existing files.				
#	Project Name	Туре	Last Modified	
1.	by MyProject1	Web Site Factory	8/30/2012 3:02 PM	
■ Lear ■ Req ■ Buy ■ Orde	ate new Select "MyProject rn to develop web applicati uest help with your project a product edition now. er our consulting services of scribe to our newsletter.	ions. t.		

Then, click on the *Design* button.



The Project Designer will open.

On the left side of the screen is the Project Browser. The right side contains the Project Explorer.

NW2 / Designer - 0	Code On Time				
🕨 Generate 🕥 Bro	owse 🧀 Develop 🛛	🍃 Open 🛛 🔩 Exit			1 🖓 AN 🛆 🗃 🖞 🖆 🖆
Home					▶ 🛅 Home
Pages Controllers	User Controls All C	Commands All Fields	All Views	All Data Fields	Employees Container1
🛅 This is a list of app	lication pages.			۷	container2
Quick Find	P New -		Vi	ew: Pages •	Orders
Name	Index Title	Path	Style	Roles	 Imployee Territories Imployee Customers
Home	1000 Start	Home	Home	n/a	b in container1
Employees	1010 Employees	Employees	Generic	n/a	container2
Orders	1020 Orders	Employees Orders	Generic		▷ III Order Details
orders		Employees Employee	Generic	пуа	Categories Container1
EmployeeTerritories	1030 Employee Territories	Territories	Generic	n/a	▷ □ container2
Customers	1040 Customers	Customers	Generic	n/a	▷ III Products
OrderDetails	1050 Order Details	Customers Order Details	Generic	n/a	Shippers Suppliers Suppliers
Categories	1060 Categories	Categories	Generic	n/a	container1
Products	1070 Products	Categories Products	Generic	n/a	D Territories
Shippers	1080 Shippers	Shippers	Generic	n/a	Membership
Suppliers	1090 Suppliers	Suppliers	Generic	n/a	
Territories	1100 Territories	Suppliers Territories	Generic	n/a	
Membership	1110 Membership Manager	Membership	Users	Administrators	
Project	Browser	Sho	wing 1-12	2 of 12 items 🕏	
All customized projet folder.	ct settings are stored in 1	*.Log.xml files located in	the root of	f your project	Project Explorer
© 2012 Code OnTime LL	C. All rights reserved. Ve	rsion 7.0.1.0.			🛅 Pages 😤 Controllers 📴 User Controls

Project Browser

The *Project Browser* allows navigating the project configuration elements. The tabs display lists of pages, data controllers, user controls, commands, fields, views, and data fields.

Navigate to the properties page of an element by clicking on the link in the first column or using the context menu option *Open*.

Generat	te 🔇 Brov	vse 🛛 🐼 Develo	p 对 Open	唱 Exit		
Home 🔄						
Pages	Controllers	User Controls	All Commands	All Fields	All Views	All Data Fields
🛅 This is	a list of applic	ation pages.				0
Quick Find	d 🔎	New 🔹			Vi	iew: Pages 🔹
Name		Index Title	Path		Style	Roles
Home	•	1000 Start	Home		Home	n/a
Empl 🗋	Open	1010 Employees	s Employe	es	Generic	n/a
Orde 🖓	Sync	1020 Orders	Employe	es Orders	Generic	n/a
Empl 🚁	Edit View	1030 Employee Territories		es Employe es	e Generic	n/a
Customers	5	1040 Customers	s Custome	ers	Generic	n/a

The properties page of the project configuration element will open. The breadcrumbs in the path area above the *Project Browser* show the location of the object. The tabs at the top of the page will change to reflect project configuration elements that belong to the currently selected element.

🕨 Generate 🛛 🚳	Browse Develop 🚰 Open 🖳 Exit			
Home > Page: H	lome (Home)			
Page Containe	rs Data Views Controls			
📴 Click OK to save	e the page, or click Cancel to undo changes or return back.			
Record -	Sync View: Page -			
* - indicates a requir	* - indicates a required field OK Cancel			
General	Name *			
The Name is assigned to the generated physical page. Index specifies the order of the page in the application	Home Index 1000 Drag the page to the desired location to change the index. External Url			

Quickly access the Learning System article for the selected project configuration element by clicking on the question mark icon in the top right corner.

Page Containers Data	Views Controls				
📴 Click OK to save the page,	📴 Click OK to save the page, or click Cancel to undo changes or return back.				
Record 🔻 📳 Sync		Learn about Pages			
* - indicates a required field		OK Cancel			
General The Name is assigned to the generated physical page.	Name * Home				

The *Project Explorer* can be synchronized with the current *Project Browser* element by using the Sync command on the action bar or pressing *Ctrl+Period* keyboard shortcut ("Ctrl" key and "." key).

Page Containers Data Views Controls	Dia Home
Click OK to save the page, or dick Cancel to undo changes Record Sync	 Employees container1 container2
* - indicates a require Synchronize with Explorer (Ctrl+.)	 Container2 Orders Employee Territories
General Name * The Name is assigned to the Home	 ▲ □ Customers ▶ □ container1 ▶ □ container2

Project Explorer

The *Project Explorer* displays a logical hierarchy of project configuration elements separated into three tabs: *Pages*, *Controllers*, and *User Controls*.

🔮 AA 🟠 📴 🗂 🖆 🗂
⊿ 🛅 Home
a in container1
Image: Second State S
Sincontainer2
🔺 🛅 Employees
b in container1
b in container2
Drders
Employee Territories
🛛 🛅 Customers
b in container1
b in container2
Drder Details
a 🛅 Categories
b in container1
▷ b container2
Products
b III Shippers
a 🛅 Suppliers
container1
▷ b container2
Territories
▷ I Membership
📴 Pages 🕂 Controllers 🔠 User Controls

Double-click on a node in the *Project Explorer* or use the *Open* context menu option to display the properties page for the relevant element.

⊿ 📴 Home	Home > Container: Home / container2 (NewColumn)		
✓ Container1 ▷	Container Data Views Controls		
🔺 🛅 🕤 Open Enter	Record - Sync		
▲ BEE List → X Cut Ctrl+X	* - indicates a required field		
	General Id The Id can be container2 renamed in the Page Project Explorer. Page The way that the Flow * container will be Positioned on the page is Kew Column ▼ determined by Width Flow property. CSS Class Name		

Drag project elements to change the application configuration. As an alternative, you can use Cut/Copy/Paste options in the context menu of project configuration element nodes. These operations can be performed on multiple selected elements of the same type.



Node names of project configuration elements can be changed using the *Rename* context menu option.



Navigate To

The Navigate To window will search for project configuration elements by property values as soon as you type a sample search criteria.

The window can be activated by clicking on the *Navigate To* icon on the *Project Explorer* toolbar or pressing the *Ctrl+Comma* keyboard shortcut ("Ctrl" key and "," key).



The *Navigate To* window will open. Start typing search terms. Matching entries will appear as soon as you stop typing.

Navigate To	
Search terms:	
products grid1 - P	
Result: Found 8 matching results.	
BD ProductSupplierCompanyName ["Field Name" of data field OrderDetails/Views/g 🔺	
Grid1 ["Id" of view Products/Views/grid1]	
grid1 ["View" of data view Products/container1/view1]	
grid1 ["View" of data view Products/container2/view2]	
Products ["Label" of view Products/Views/grid1]	
ab grid1 ["Command Argument" of action Products/Actions/ag1/a8]	
ab grid1 ["When View" of action Products/Actions/ag4/a1]	
4	
"Id" of view Products /Views/ grid1 grid1	
OK Cancel]

Highlight a result and press *OK* or press *Enter* on the keyboard to open the properties page of the element in the *Project Browser* and have it highlighted in the *Project Explorer*.



Creating a Three-Level Master-Detail Page

Let's create a page with a three-level master-detail relationship between *Customers*, *Orders*, and *Order Details* controllers.



Creating the Page

Start the Project Designer. On the toolbar of the Project Explorer, click on the New Page icon.

🤮 🗛 🖀 📴 🗳 📫 📫
▷ Home New Page ▲ Employees
container1
container2
Orders
Employee Territories

Enter "OrderManager" in the page *Name* and press *OK* to create a new page.

Property	Value
Name	OrderManager

The Order Manager page will be added to the bottom of the list of pages in the *Project Explorer*. Drag Order Manager node to the right side of *Home* node to place it after the page.



Switch to the *Controllers* tab in the *Project Explorer*. While holding *Ctrl*, select the controllers in the following order: *Customers*, *Orders*, *OrderDetails*. Right-click on *OrderDetails*, and press *Copy*.

🔮 🗛 🙆 🍕 🖸	
Image: Second state sta	
🛅 Pages 🕂 Controllers 🔠 User Control	s

Switch back to the *Pages* tab. Right-click on *Order Manager* page node, and press *Paste* option. The controllers will be instantiated as data views in separate containers on the page.



Right-click on Order Manager page node, and press View in Browser.

▷ III Home III Order Manager	
▷ □ c101 □ c102 ▷ □ view2	Open Enter View in Browser
	Cut Ctrl+X Copy Ctrl+C Delete Del Rename
 Shippers Suppliers Membership 	Show All Containers Exclude From Menu New Child Page
	New Container

Navigate to the *Order Manager* page. Three views will be available on the page, but they do not have any masterdetail relationships established between them. The three data views are completely independent from each other.

	r Manage	51								
This is a list	of customers.									
Quick	Find 🔎	🖃 New Custom	ners 🛛 🞲 Edit	🗙 Delete	Actions 🗸	Report	×	View	: Cust	omers 🗸
🔃 A filter l	has been applied.	Company Name e	quals Antonio I	Moreno Taque	ería.					x
Customer#	Company Name 🦷	Contact Name	Contact Titl	e Address	C	City	Region	Postal Code	Country	Phone
ANTON	Antonio Moreno Taquería	Antonio Moreno	Owner	Mataderos	7317	léxico).F.	n/a	05023	Mexico	(5) 555- 3932
								Showing	; 1-1 of 1	L items 🕏
This is a list	of orders.									
Quick	Find 🔎	Rew Orders	Actions 🗸	Report 🗸					View: 0	Orders 🗸
🔅 A filter l	has been applied.	Order Date equal	s 7/31/1996 .							x
Customer Company Na		ast Order	Required Sh	ipped Ship Vi	ia ,					Ship
		Date 🍸	Date Da	ate Compa	any Name	Freight Sh	nip Nam	e Sł	nip Addre	city
White Clove Markets		Date 🍸		9/1996 Speed Expres	any Name	¢4 56 W		over 10	nip Addre 029 - 12tl ve. S.	City
	ar			9/1996 Speed	any Name	¢4 56 W	hite Cla	over 10 Av	029 - 12ti ve. S.	city
Markets	ar			9/1996 Speed	any Name	¢4 56 W	hite Cla	over 10 Av	029 - 12ti ve. S.	^{ss} City ^h Seattle
Markets	er Buchanan of order details.		8/14/1996 8/9	9/1996 Speed Expres	ly ss	¢4 56 W	hite Cla	over 10 An Showing)29 - 12tl ve. S.) 11-11 of 1	^{ss} City ^h Seattle
Markets This is a list Quick I	er Buchanan of order details.	7/31/1996	8/14/1996 8/9 Details Action	9/1996 Speed Expres	y ss	\$4.56 W	hite Cla	over 10 An Showing)29 - 12tl ve. S.) 11-11 of 1	^{ISS} City ^h Seattle Litems 2
Markets This is a list Quick I A filter H	er Buchanan of order details. Find P has been applied.	7/31/1996	8/14/1996 8/9 Details Action	9/1996 Speed Expresent Systems V Report Tigers, Quant Order	y ss	\$4.56 W Mi Order Via Cor	hite Clo arkets	over 10 An Showing	029 - 12tb ve. S. 11-1 of 1 Order D	City City City Seattle Litems
Markets This is a list Quick I A filter I	er Buchanan of order details. Find P has been applied.	7/31/1996	8/14/1996 8/9 Details Action uals Carnarvon ntity T Discoun	9/1996 Speed Expresent Systems ✓ Report Tigers. Quant Order Customer Company	V SS V Crder Employee Last Name	\$4.56 W Mi Order Via Cor	hite Clo arkets Ship mpany	View: Product Categor	029 - 12tb ve. S. 0 1-1 of 1 Order D Order D	City City City Seattle Litems

Establishing Master-Detail Relationships

Switch back to the *Project Designer*. In the *Project Explorer*, drag the data field node *Order Manager / c102 / view2 / grid1 / CustomerID* onto the view node *Order Manager / c101 / view1*. This will configure a master-detail relationship between *view2* and *view1*, with *CustomerID* as the filter field.



Next, drag the data field node Order Manager / c103 / view3 / grid1 / OrderID and drop it onto view node Order Manager / c102 / view2.



On the toolbar, press Browse.

Only the Customers data view is now visible on the Order Manager page.

This is a list	of customers.								
Quick	Find 🔎 🛋	New Custom	ers Actions V	Report 🗸			V	/iew: Cus	tomers 🗸
Customer#	Company Name	Contact Name	Contact Title	Address	City	Region	Postal Code	Country	Phone
ALFKI	Alfreds Futterkiste	Maria Anders	Sales Representative	Obere Str. 57	Berlin	n/a	12209	Germany	030- 0074321
ANATR	Ana Trujillo Emparedados y helados	Ana Trujillo	Owner	Avda. de la Constitución 2222	México D.F.	n/a	05021	Mexico	(5) 555- 4729
ANTON	Antonio Moreno Taquería	Antonio Moreno	Owner	Mataderos 2312	México D.F.	n/a	05023	Mexico	(5) 555- 3932
AROUT	Around the Horn	Thomas Hardy	Sales Representative	120 Hanover Sq.	London	n/a	WA1 1DP	UK	(171) 555- 7788
BERGS	Berglunds snabbköp	Christina Berglund	Order Administrator	Berguvsvägen 8	Luleå	n/a	S-958 22	Sweden	0921-12 34 65
BLAUS	Blauer See Delikatessen	Hanna Moos	Sales Representative	Forsterstr. 57	Mannheim	n/a	68306	Germany	0621-0846
BLONP	Blondesddsl père et fils	Frédérique Citeaux	Marketing Manager	24, place Kléber	Strasbourg	n/a	67000	France	88.60.15.3
BOLID	Bólido Comidas preparadas	Martín Sommer	Owner	C/ Araquil, 67	Madrid	n/a	28023	Spain	(91) 555 2 82
BONAP	Bon app'	Laurence Lebihan	Owner	12, rue des Bouchers	Marseille	n/a	13008	France	91.24.45.4
BOTTM	Bottom-Dollar Markets	Elizabeth Lincoln	Accounting Manager	23 Tsawassen Blvd.	Tsawassen	BC	T2F 8M4	Canada	(604) 555- 4729

Select a record from the list of customers, and orders related to the selection will appear in a data view underneath.

	customers.								
🥑 Quick Fin	d 🔎	🖃 New C	Customers	😡 Edit	🗙 Delete	Actions 🗸	Report 🗸	View:	Customers
i) A filter has	been applied.	Company N	ame equals	Ana Trujil	lo Empareda	dos y helado)S .		3
Customer# Co	ompany Name '	Conta Name	CO	ntact Title	Address	City	Region	Postal Code Coun	try Phone
ANATR En	na Trujillo nparedados y elados	Ana T	rujillo Ov	ner	Avda. de la Constitución	México 2222 D.F.	n/a	05021 Mexic	(5) 555- 4729
								Showing 1	-1 of 1 items (
 Quick Fin 	d 🔎	📄 🖃 New 🕻	Orders A	Actions 🗸	Report 🗸			Vi	ew: Orders
imployee Last	-	Required	Shipped	Ship Via	Freid	ht Ship Name		Vi Ship Addres	s Ship
			Shipped Date	Ship Via Company	Freid	₆₁ Ana Trujillo)	Ship Addres Avda. de la	s Ship City México
imployee Last lame	Order Date	Required Date	Shipped Date	Ship Via Company Federal Shipping	Name Freig	61 Ana Trujillo Emparedac	los y helados	Ship Addres	s Ship City 2222 D.F. Méxica D.F.
imployee Last lame King	Order Date 9/18/1996 8/8/1997	Required Date 10/16/1996	Shipped Date 9/24/1990 8/14/1993	Ship Via Company Federal Shipping Speedy Express	Name Freig \$1.6	61 Ana Trujillo Emparedac 90 Ana Trujillo Emparedac	o dos y helados dos y helados	Ship Address Avda. de la Constitución Avda. de la	s Ship City 2222 D.F. 2222 D.F. México D.F. México D.F.
Employee Last lame King Leverling	Order Date 9/18/1996 8/8/1997	Required Date 10/16/1996 9/5/1997	Shipped Date 9/24/1990 8/14/1993	Ship Via Company Federal Shipping Speedy Express Federal Shipping	v Name Freig \$1.4 \$43.9	61 Ana Trujillo Emparedac 90 Ana Trujillo Emparedac 99 Ana Trujillo Emparedac 92 Ana Trujillo	los y helados los y helados los y helados	Ship Address Avda. de la Constitución Avda. de la Constitución Avda. de la	s Ship City 2222 D.F. 2222 D.F. 2222 D.F. México D.F. México D.F. México

Select an order, and order details for that order will be displayed.

	st of custo		25			N					
🕑 Quick	k Find	Q	🖃 New	Customers	🞲 Edit	🗙 Delete	Actions ~	Report ∨	Viev	: Customers	5 ~
i) A filter	r has bee	n applied.	Company N	Name equal	s <mark>Ana Trujil</mark> l	lo Empareda	idos y hela	dos.			X
Customer#	# Compa	ny Name 🍾	Cont Name		ontact Title	Address	City	Regior	n ^{Postal} Co Code	ountry Phone	
ANATR	Ana Tru Empare helados	dados y	Ana 1	Trujillo O	wner	Avda. de la Constitución	Méxi 2222 D.F.	- D/D	05021 Me	exico (5) 555 4729	-
									Showing	; 1-1 of 1 items	12
Orders											
This is a lis	t of orde	rs.									
Quick	k Find	Q	📑 New	Orders	🗾 Edit 🛛 🗙	Colete A	ctions 🗸	Report 🗸		View: Orders	5 ~
i) A filter	r has bee	n applied. I	Employee l	ast Name	equals King.						x
imployee I Jame 🍸	Last Or		Required Date	Shipped Date	Ship Via Company	Name Freig	jht Ship Nam	ie	Ship Addr	ess Shi Cit	
King	9/:	18/1996	10/16/199	6 9/24/199	96 Federal Shipping	O \$1.	61 Ana Truji Empared	illo ados y helado	Avda. de s Constituc		xico =,
									Showing	1-1 of 1 items	12
Drder D This is a lis		r details.		Order Deta	ils Actions	Report			Views	Order Details	
Y Quick	r rina	\mathcal{P}	- New	Order Deta	ans Acuoris	Keport	. *		view:	Order Details	• ~
Product Na	ame	Unit Price	Quantity	Discount	Order Custom Company Nam	Employ		ler Ship Via npany Name	Product Category Name	Product Supp Company Nar	
Gudbrand	sdalsost	\$28.80	1	0 8	Ana Trujillo Emparedados helados	y King	Fed	leral Shipping	Dairy Products	Norske Meieri	ier
					Ana Trujillo	y King	Ead	leral Shipping	Powerages	Pavlova, Ltd.	
Outback L	.ager	\$12.00	5		Emparedados helados	y Ning	reu	ierar onipping	Develoyes	Faviova, Ltu.	

Select a child order detail. The record will be displayed in a modal form.

Order M	anager	
Quick Find	🔎 🖃 New Custo	mers 📝 Edit 🗙 Delete Actions 🗸 Report 🗸 View: Customers 🗸
(i) A filter has be	en applied. Company Name	equals Ana Trujillo Emparedados y helados. X
Customer# Comp	any Name 🍸 🦳 Contac Name	t Contact Title Address City Region Postal Country Phone
ANATR Ana	Review Order Details	×
y ne	Please review order details or click Cancel/Close to ret	s information below. Click Edit to change this record, click Delete to delete the record,
Orders	Order Details	diff back.
This is a list of or	These are the fields of the	order details record that can be edited.
Quick Find	Product Name *	Gudbrandsdalsost 🥜 🛋
(i) A filter has b	Unit Price *	\$28.80
Employee Last (Quantity *	1
Name 🍸 🛛 🛛	Discount *	0
King 9	Reference Information	
	Additional details about or	der details are provided in the reference information section.
Order Details This is a list of or	Order Customer Company Name	Ana Trujillo Emparedados y helados
Quick Find	Order Employee Last Name	King
Product Name	Order Ship Via Company Name	Federal Shipping
	Product Category Name	Dairy Products
Gudbrandsdalso:	Product Supplier Company Name	Norske Meierier
Outback Lager	🏠 🎝 * - indicates a requ	ired field OK Delete Cancel

If a master data view enters "New" mode, the child data views will automatically become hidden.

For example, if a new customer is created, the data views *Orders* and *Order Details* will be invisible. If a new order is created, only *Order Details* data view will disappear.

Record 🗸		View: New Customers
- indicates a required	field	OK Cance
lew Customers		
omplete the form. Mal	ke sure to enter all required fields.	
Customer # *		
Company Name *		
Contact Name		
Contact Title		
Address		
City		
Region		
Postal Code		
Country		
Phone		
Fax		
- indicates a required t	field	OK Cance

Rearranging Data Fields

The application generator composes this view of *Customers* from the database.

This is a list	of customers.								
Quick	Find 🔎 🛙	🚽 New Custo	mers Actions	✓ Report ∨			1	View: Cus	tomers
Customer#	Company Name	Contact Name	Contact Title	Address	City	Region	Postal Code	Country	Phone
ALFKI	Alfreds Futterkiste	Maria Anders	Sales Representative	Obere Str. 57	Berlin	n/a	12209	Germany	030- 0074321
ANATR	Ana Trujillo Emparedados y helados	Ana Trujillo	Owner	Avda. de la Constitución 2222	México D.F.	n/a	05021	Mexico	(5) 555- 4729
ANTON	Antonio Moreno Taguería	Antonio Moreno	Owner	Mataderos 2312	México D.F.	n/a	05023	Mexico	(5) 555- 3932

Let's change some of the data fields presented in the view. For example, let's move *Phone* data field next to *Contact Name*, remove the *Region* data field, and add *Fax* to the view.

Moving

Switch to the Project Designer. In the Project Explorer, activate the Controllers tab and expand to Order Manager / c101 / view1 / grid1 data view node. Drag Phone data field and drop it on the right side of ContactName data field to place it after the target.



Deleting

Right-click on Order Manager / c101 / view1 / grid1 / Region data field node, and select Delete.



Adding

Expand Customers / Fields node. Drag Fax field node onto Customers / Views / grid1 node to create a data field from the Fax field.



Switch to the Pages tab in the Project Explorer. Right-click on Order Manager page node, and press View in Browser.



The *Customers* grid with new column layout will be displayed. The *Phone* field is more conveniently placed next to the *Contact Name*. The *Region* field has been removed. *Fax* has been added.

🥑 Quick I	Find 🔎 🕻	📑 New Cust	omers Acti	ons 🗸 Report	: ~		View: Cus	tomers v
Customer#	Company Name	Contact Name	Phone	Contact Title	Address	City	Postal Country Code	Fax
ALFKI	Alfreds Futterkiste	Maria Anders	030- 0074321	Sales Representative	Obere Str. 57	Berlin	12209 Germany	030- 0076545
ANATR	Ana Trujillo Emparedados y helados	Ana Trujillo	(5) 555- 4729	Owner	Avda. de la Constitución 2222	México D.F.	05021 Mexico	(5) 555- 3745
ANTON	Antonio Moreno Taquería	Antonio Moreno	(5) 555- 3932	Owner	Mataderos 2312	México D.F.	05023 Mexico	n/a

Designing Forms

Let's customize the forms on the Order Manager page.

Floating Category Data Fields

When a customer is selected, the data item is displayed in the form view *editForm1*. The form data fields are rendered top-down.

Please review customers info return back.	rmation below. Clic	k Edit to chang	ge this record, click Dele	ete to delete the record, or	r dick Cancel/Clo	se to
Record 🗸				View:	Review Custor	mers 🗸
 These are the fields of the cut 		at can be edite	d.	ОК	Delete	Cancel
Company Name * Contact Name Contact Title Address City Region Postal Code Country Phone	ALFKI Alfreds Futterkiste Maria Anders Sales Representati Obere Str. 57 Berlin 12209 Germany 030-0074321 030-0076545	ve]		
 Indicates a require Orders This is a list of orders. 	ed field			ок	Delete	Cancel
Quick Find	New Orders	Actions V	Report 🗸		View: Or	ders 🗸
Employee Last Name Order Da	ate Required Date	Shipped Date	Ship Via Company Name	Freight Ship Name	Ship Address	Ship City
Suyama 8/25/19	97 9/22/1997	9/2/1997	Speedy Express	\$29.46 Alfreds Futterkiste	Obere Str. 57	Berlin

Let's have the data fields displayed in a more compact fashion.

Switch back to the Project Designer. On the Pages tab of Project Explorer, double-click on Order Manager / c101 / view1 / editForm1 / c1 – Customers category node.



Change the *Float* property:

Property	Value		
Float	Yes		

Press OK to save the category. Right-click on Order Manager page node, and press View in Browser.



The data fields in *Customers* form view float from left to right and wrap when they reach the right side of the browser window which makes for a more compact presentation. If the browser window is resized, the form will resize as well.

Please review custome return back.	rs information	below. Click	k Edit to chang	e this record, dick De	lete to delete the rec	ord, or click Cancel/	Close to
New Customers	Actions 🗸	Report V	*		۷	/iew: Review Cus	tomers 🗸
1 4 🗳						Edit Delete	Close
Customers							
These are the fields of	the customers	record tha	t can be edite	d.			
Customer#	Compa	ny Name	Cor	ntact Name	Contact Title		
ALFKI	Alfreds Futterkiste		te Ma	ria Anders	Sales Representa	ative	
Address	City		Reg	jion	Postal Code		
Obere Str. 57	Berlin		N/	A	12209		
Country	Phone		Fax	r			
Germany	030-0	074321	03	0-0076545			
↑ ↓ ⊴					[Edit Delete	Close
Orders							
This is a list of orders.							
♥ Quick Find	р 🖃 Ne	ew Orders	Actions 🗸	Report 🗸		View:	Orders v
Employee Last O	rder Date Rec Dat	quired æ	Shipped Date	Ship Via Company Name	Freight Ship Name	e Ship Addr	ess Ship City
Suyama 8/	/25/1997 9/2	2/1997	9/2/1997	Speedy Express	\$29.46 Alfreds Futterkist	Obere Str	Berlin

Configuring a Multi-Column Form

The picture below shows *editForm1* view of *Orders* data controller. Let's use categories to organize the data fields in multiple columns.

New Orders Actio	ns ∨ Report ∨	View: Review Orders V		
-		Edit Delete Close		
rders				
hese are the fields of the	orders record that can be edite	d.		
Employee Last Name	Suyama 💿			
Order Date	8/25/1997			
Required Date	9/22/1997			
Shipped Date	9/2/1997			
Ship Via Company Name	Speedy Express 🔘			
Freight	\$29.46			
Ship Name	Alfreds Futterkiste			
Ship Address	Obere Str. 57			
Ship City	Berlin			
Ship Region	N/A			
Ship Postal Code	12209			
Ship Country	Germany			

In the *Project Explorer*, right-click on *Order Manager / c102 / view2 / editForm1* view node. Select *New Category* context menu option.
⊳ 🛅 Home						
a 🛅 Order Manager						
⊳ 🛅 c101						
a 🛅 c102						
a 🛅 view2 (Orders, grid1) -> view1						
Þ 📴	> 🛺 grid1					
⊳ि	editForm1					
Ľ	Open	Enter				
	List					
a 🛅 🤇 💑	Cut	Ctrl+X				
> 🛄 📭	Сору	Ctrl+C				
	Delete	Del				
	Rename					
> 🛅 E 🏤	Show View 'editForm:	1' in Controller				
⊿ 🛅 C	Show All Categories					
	Show Styles					
▷ 🛅 🎦	New Category					
b Shippe						
b 🛅 Suppli	ers					
Memb	ership					

Assign the following properties:

Property	Value
Header Text	Shipping Info
Description	This is the shipping information.
New Column	Yes

Press OK to save the category.

In the *Project Explorer*, expand *Order Manager / c102 / view2 / editForm1 / c1 – Orders* category node. Select all data fields that start with "Ship-". Drag the data fields onto *c2 – Shipping Info* category node.



Right-click on Order Manager page node and select View in Browser.



Data fields on the Orders form will be split in two columns.

Orders

Please review orders information below. Click Edit to change this record, click Delete to delete the record, or click Cancel/Close to return back.

Rew Orders Actio	ns ∨ Report ∨			View: Review Orders 🗸
Orders These are the fields of the	orders record that can be edited.	*	Shipping Info This is the shipping info	Edit Delete Close
Employee Last Name Order Date Required Date Shipped Date Ship Via Company Name Freight	Suyama 11/15/1996 12/13/1996 11/20/1996 Speedy Express \$41.95		Ship Name Ship Address Ship City Ship Region Ship Postal Code Ship Country	Around the Horn Brook Farm Stratford St. Mary Colchester Essex CO7 6JX UK
1 4 4			Edit Delete Close	

Custom Category Template

The Order Details layout of editForm1 view created by the application generator is shown below.

Please review order details information below. Click Edit to change this record, dick Delete to delete the record, or dick Cancel/Close to return back.						
Order Details These are the fields of th	e order details record that can be edited.					
Product Name	Rössle Sauerkraut 🛇					
Unit Price	\$45.60					
Quantity	15					
Discount	0.25					
Reference Informatio	n					
Additional details about o	rder details are provided in the reference information section.					
Order Customer Company Name	Alfreds Futterkiste					
Order Employee Last Name	Suyama					
Order Ship Via Company Name	Speedy Express					
Product Category Name	Produce					
Product Supplier Company Name	Plutzer Lebensmittelgroßmärkte AG					

Let's create a custom layout for the first category in *Order Details* form. In the *Project Explorer*, right-click on *Order Manager / c103* container node, and select *New Control*.



Next to the User Control property lookup, activate the New User Control icon.



Assign a name to the user control.

Property	Value
Name	OrderDetails_CustomCategoryTemplate

Press OK to insert the new user control into the User Control property, and press OK again to save the control.

On the *Project Designer* toolbar, press *Generate*. When complete, right-click on *Order Manager / c103 / control1* node, and press *Edit in Visual Studio*.

⊳ 🛅 Home			
🔺 🛅 Order I	Manager		
⊳ 🛅 c101	L		
⊳ 🚞 c102	2		
a 🛄 c103	3		
⊳ 🗖 ∨	iew3 (Orderl	Details, grid1) ->	view2
⊳ <u>⊠</u> ⊂	ontrol1 - Or	derDetails_Custo	mCategoryTemplate
⊿ 🛅 C 📑	Open	Enter	
▷ 🛄 🛷	Edit in Visu	ial Studio	
	List		
⊳ 🖬 👗	Cut	Ctrl+X	
> 📴 Er 📭	Сору	Ctrl+C	
1 ⊂ X	Delete	Del	
	Rename		
	Show User	Control]
⊳ 📰 Տիրթա	15		

The template file will open in *Visual Studio*. On the menu, select *Edit* | *Advanced* | *Format Document*. Replace everything after the <% Control >> element with the following:

```
<div style="display: none;">
  <div id="OrderDetails_editForm1_c1">
     >
          Product:
          <span class="FieldPlaceholder DataOnly">{ProductID}</span>
          Discount:
          <span class="FieldPlaceholder DataOnly">{Discount}</span>
          >
          Unit Price:
          <span class="FieldPlaceholder DataOnly">{UnitPrice}</span>
          Quantity:
          <span class="FieldPlaceholder DataOnly">{Quantity}</span>
          </div>
</div>
```

Save the file.

Refresh the web browser page and select a customer, order, and order detail data rows. The first category of *editForm1* view of *Order Details* data controller will be rendered using the new template.

Please review order deta Cancel/Close to return ba	ls information below. Click Edit to change this record, click Delete to delete the record, or click ick.
Order Details	
These are the fields of th	e order details record that can be edited.
Product: Rös Unit Price: \$45.	sle Sauerkraut Discount: 0.25 60 Quantity: 15
Reference Information Additional details about o	n rder details are provided in the reference information section.
Order Customer Company Name	Alfreds Futterkiste
Order Employee Last Name	Suyama
Order Ship Via Company Name	Speedy Express
Product Category Name	Produce
Product Supplier Company Name	Plutzer Lebensmittelgroßmärkte AG
company mane	
company name	

Configuring Charts

Let's create a chart that will graphically present orders broken down by quarter.

Creating the View

Start the Project Designer. In the Project Explorer, activate the Controllers tab. Right-click on Orders / Views node, and press New View.



Give this view the following properties:

Property	Value
Id	OrdersByQuarter
Туре	Chart
Label	Orders By Quarter

Press OK to save the view.

A chart requires at least two fields. One field will represent the values, and the other will form the *x*-axis of the chart that will group values by a certain criteria. A chart may have more than one field representing values.

For example, to display a chart of orders grouped by quarter, the *OrderID* field will represent values and *OrderDate* will represent the *x*-axis.

In the *Project Explorer*, expand the *Orders / Fields* node. Using *Ctrl* key, select *OrderID* and *OrderDate* fields, and drag them onto *Orders / Views / OrdersByQuarter* view node.



This will create two data fields. Double-click Orders / Views / OrdersByQuarter / OrderID data field node.



Assign the following values:

Property	Value
Aggregate	Count
Chart	Bar (Cylinder)

Press OK to save the data field. Double-click Orders / Views / OrdersByQuarter / OrderDate data field node.



Assign these values:

Property	Value
Data Format String	МММ ууу
Chart	X, Quarter

Press OK to save.

Viewing the Results

On the Project Designer toolbar, press Browse.

Navigate to the Order Manager page. Select a customer from the first data view. Use the View Selector in the top right corner of Orders data view to switch to Orders By Quarter view.

	¢ p	🛋 New C	ustomers	💷 Edit	🗙 Delete	Actions 🗸	Report ∨	Vie	ew: Cu	stomers	Y
🔃 A filter has	been applied.	Company Na	ame equals 🖡	Alfreds Fu	utterkiste.						x
Customer# Cor	mpany Name '	Contact Name	Phone	Con	tact Title 🛛 🖌	Address	City	Postal Code	Country	Fax	
ALFKI Alfr	reds Futterkis	te Maria Anders	030- 007432	Sale 1 Rep	es resentative	Obere Str. 57	Berlin	12209	Germany	030- 0076545	
								Showir	ng 1-1 o	f 1 items	4
Orders This is a list of o		_27							1.5		
Quick Find	م <u>م</u>	🖃 New O	rders Ac	tions 🗸	Report 🗸					Orders	~
Employee Last Name	Order Date	Required	Shipped	Ship Via				V 0)rders		
		Date	Date	Company	y Name Frei	ight Ship Name	2			y Quarter	
Suyama	8/25/1997	Date 9/22/1997	Date 9/2/1997		y Name	9.46 Alfreds Fu			orders By	y Quarter Berlin	ו
	8/25/1997 10/3/1997		9/2/1997	Company Speedy Express	y Name \$29 \$61		itterkiste	0	orders By Str. 57		
Suyama	10/3/1997	9/22/1997	9/2/1997 10/13/1997	Company Speedy Express United Package	\$29 \$61	.46 Alfreds Fu	utterkiste	Obere S	orders By Str. 57 Str. 57	Berlin	n
Suyama Peacock	10/3/1997 10/13/1997	9/22/1997 10/31/1997	9/2/1997 10/13/1997	Company Speedy Express United Package Speedy	\$29 \$61 \$23	46 Alfreds Fu	utterkiste utterkiste utterkiste	Obere S Obere S	orders By Str. 57 Str. 57 Str. 57	Berlin Berlin	ו

The chart will be displayed, showing the number of orders in each quarter filtered by the selected customer.



If you select another customer, the orders will change to reflect the new selection.



Creating Many-to-Many Fields

The Northwind database features a many-to-many relationship between Territories and Employees.



The app generator will create a page for *EmployeeTerritories* that allows editing records directly.

Home > Employees > Employee Territories Employee Territories					
This is a list of employee territories.					
Quick Find ₽ ➡ New Actions ∨ Report	View: Employee Territories V				
Employee Last Name	Territory Description				
Davolio	Wilton				
Davolio	Neward				
Fuller	Westboro				

EmployeeTerritories is also available as a child data view on the *Employees* page. Selecting an employee will reveal a list of related territories.

This is a list of e	employees.									
Quick Fina	1	P 🛋 New Er	mployees	😡 Edit 🛛 🗙 (Delete	Actions 🗸	Report ∨	View:	Employe	es 🗸
i A filter has	been appli	ed. First Name e	quals Nancy	1.						x
Last Name	rst ame 🍸 Tit	le	Title Of Courtesy	Birth Date	Hire Dat	e Address	3	City	Region	Postal Code
Davolio Na	ancv	lles presentative	Ms.	12/8/1948	5/1/199	2 507 - 20 2A)th Ave. E. Apt.	Seattle	WA	98122
								Showing 1	- 1 of 1 iter	ms 🥏
Employees	Orders	Employee	Territories							
This is a list of e	employee t	erritories.								
Quick Fina	1	P 🛋 New	Actions 🗸	Report 🗸			View:	Employee	Territori	ies 🗸
Territory Descri	iption									
Wilton										~
Neward										
								Showing 1	- 2 of 2 iter	ms 🥏

Let's create a many-to-many field on the employee edit form that will allow selecting territories in a check box list. Each option in the list will represent a territory from the *Territories* table. The checkbox next to the territory name will be checked if there is a record in the *EmployeeTerritories* table linking the selected employee with the territory. The relevant *EmployeeTerritories* records will be inserted or deleted when the user changes the selection of checkboxes and saves the employee record.

Start the Project Designer. In the Project Explorer, switch to the Controllers tab. Right-click on Employees / Fields node, and press New Field.



Give this field the following values:

Property	Value
Name	Territories
Allow null values	true
The value of this field is computed at run-time by SQL expression.	true
Label	Territories
Items Style	Check Box List

Items Data Controller	Territories
Data Value Field	TerritoryId
Data Text Field	TerritoryDescription
Target Controller	EmployeeTerritories

Press OK to save the field.

Drag Employees / Fields / Territories field node onto Employees / Views / editForm1 view node.



Double-click on Employees / Views / editForm1 / Territories data field node.



Change the Columns property:

Property	Value
Columns	5

Press OK to save. Switch to the Pages tab. Right-click on Employees page node, and press View in Browser.



View the details for an employee. *Territories* field will display a comma-separated list of values associated with the employee.

Employees

These are the fields of the employees record that can be edited.

Last Name	Davolio
First Name	Nancy
Title	Sales Representative
Title Of Courtesy	Ms.
Birth Date	12/8/1948
Hire Date	5/1/1992
Address	507 - 20th Ave. E. Apt. 2A
City	Seattle
Region	WA
Postal Code	98122
Country	USA
Home Phone	(206) 555-9857
Extension	5467
Photo	
Notes	Education includes a BA in psychology from Colorado State University in 1970. She also completed "The Art of the Cold Call." Nancy is a member of Toastmasters International.
Reports To Last Name	Fuller O
Photo Path	http://accweb/emmployees/davolio.bmp
Territories	Neward , Wilton
1 🖡 🛃	Edit Delete Close

Press *Edit* button. All territories will be rendered as a check box list.

Photo	
	Click <u>here</u> to upload or clear employees photo file.
Notes	Education includes a BA in psychology from Colorado State University in 1970. She also completed "The Art of the Cold Call." Nancy is a member of Toastmasters International.
Reports To Last Name	Fuller 🥜 📑
Photo Path	http://accweb/emmployees/davolio.bmp
Territories	Atlanta Cary Hoffman Estates Philadelphia Santa Monica
	Austin Chicago Hollis Phoenix Savannah
	Beachwood Colorado Springs Louisville Portsmouth Scottsdale
	Bedford Columbia Mellvile Providence Seattle
	Bellevue Dallas Menlo Park Racine Southfield
	Bentonville Denver Minneapolis Redmond Tampa
	Bloomfield Hills Edison Morristown Rockville Troy
	Boston Fairport New York Roseville Westboro
	🗌 Braintree 📄 Findlay 📄 New York 📄 San Francisco 🗹 Wilton
	🗖 Cambridge 📄 Georgetow 📝 Neward 📄 Santa Clara
	Campbell Greensboro Orlando Santa Cruz
👚 🦺 * - indicates a requ	ired field OK Delete Cancel

Check or uncheck several values, and press OK to save the record. Select the record to verify that the changes were persisted.

Changing the Child Views

The Employee Territories child data view is now unnecessary.

Switch back to the *Project Designer*. In the *Project Explorer*, right-click on *Employees / container2 / view4* node, and press *Delete*.



Drag view3 node on the left side of view2 to place it in the first position.



Right-click on *Employees* page node, and press *View in Browser*.



Select an employee from the list, and the *Orders* and *Employees* child data view tabs will appear below. The *Employee Territories* child data view tab is no longer present. The picture also shows the many-to-many field *Territories* in the master grid view.

✓ Quick Find	P =	New Emplo	yees 💷	Edit 🗙 D	elete Actio	ons 🗸 🛛 Repor	t∨	View:	Employees 🗸
🔃 A filter has been	applied. Firs	t Name equa	s Nancy.						>
ast Name 🛛 First Name 🦷	Title	Title C Court	BirthD	ate Hire Date	Address	City F	Region Pos	stal de	itories
Davolio Nancy	Sales Represen	tative ^{Ms.}	12/8/1	.948 5/1/1992	507 - 20ti Ave. E. A 2A		NA 98	122 New	ard , Wilton
							Sh	nowing 1 -	-1 of 1 items 🥻
Orders Employ	vees								
This is a list of orders	3.								
✓ Quick Find	<u>م</u>	New Order	s Action	ns 🗸 🛛 Repor	t∽			Vie	ew: Orders v
Customer Company Name	Order Date	Required Date	Shipped Date	Ship Via Com Name	oany Freigh	t Ship Name	Ship	Address	Ship City
Ernst Handel	7/17/1996	8/14/1996	7/23/1996	Speedy Express	\$140.5	1 Ernst Handel	Kird	hgasse 6	Graz
Wartian Herkku	8/1/1996	8/29/1996	8/2/1996	Speedy Express	\$136.5	4 Wartian Herk	tu Tori	katu 38	Oulu
Magazzini Alimentari Riuniti	8/7/1996	9/4/1996	8/9/1996	Speedy Express	\$26.9	3 Magazzini Alimentari Riu		Ludovico i o 22	il Bergamo
QUICK-Stop	8/20/1996	9/17/1996	8/26/1996	United Package	\$76.8	3 QUICK-Stop	Tau	cherstraß	3e 10 Cunewald
Tradição	8/28/1996	9/25/1996	9/2/1996	United Package	\$1.3	5 Tradiçao Hipermercado		Inês de tro, 414	Sao Paulo

Creating Calculated Fields

The picture below shows the Order Details form in edit mode.

E	nolovee Last Required Shipped Ship Via
Review Order Detai	ls X
	tails information below. Click Edit to change this record, click Delete to delete the record, or click
Cancel/Close to return Order Details	Dack.
	the order details record that can be edited.
Product: R	össle Sauerkraut 🥢 🛋 Discount: 0.25
Unit Price: \$4	15.60 Quantity: 15
Reference Informat	
Additional details about	t order details are provided in the reference information section.
Order Customer Company Name	Alfreds Futterkiste
Order Employee Last Name	Suyama
Order Ship Via Compa Name	ny Speedy Express
Product Category Nar	ne Produce
Product Supplier Company Name	Plutzer Lebensmittelgroßmärkte AG
👚 🐥 * - indicates a r	required field OK Delete Cancel
	- ottenste

Let's create a calculated field called *Extended Price* that will display the extended price of the Order Details item.

Calculated fields are also known as *virtual* fields. The field value is not stored in the database - it is calculated at runtime based on values of other fields in the data row.

Creating the virtual Field

Activate the Project Designer. In the Project Explorer, switch to the Controllers tab. Right-click on OrderDetails / Fields node, and press New Field.



Assign the following values:

Property	Value
Name	ExtendedPrice
Туре	Currency
Label	Extended Price
Allow Query-by-Example	true
Allow Sorting	true

Press OK to save. Drag OrderDetails / Fields / ExtendedPrice node onto OrderDetails / Views / grid1 node to bind the field to the view grid1.



Drag OrderDetails / Fields / ExtendedPrice node onto OrderDetails / Views / editForm1 / c1 – Order Details node to bind the field to view editForm1.



Finally, drag OrderDetails / Fields / ExtendedPrice node onto OrderDetails / Views / createForm1 node.



A binding of field to a view is called a data field.

On the toolbar, press *Browse* and navigate to the *Order Manager* page. The *Extended Price* data field is visible in the grid and in the form views of *Order Details*. However, the field is rendered as blank.

Order Details This is a list of order of	details.							
Quick Find	ρ Record \vee						View: Ord	er Details 🗸
Product Name	Unit Price Quantity	Discount	Order Customer Company Name	Order Employee Last Name	Order Ship Via Company Name	Product Category Name	Product Supplier Company Name	Extended Price
Rössle Sauerkraut 🥢 🚅	\$45.60 15	0.25	Alfreds Futterkiste	Suyama	Speedy Express	Produce	Plutzer Lebensmittelgroßmärkte AG	
Save Cance	el							

Note that if you have a custom category template associated with the form view, then the field will not be visible automatically. In that case, the custom category template for *editForm1* needs to be updated to display the data field.

Read the next section to learn how to include the new virtual data field in the template, or skip to the following section discussing how to provide an SQL Formula for the field.

Updating the Custom Category Template

Switch to the *Project Designer*. In the *Project Explorer*, switch to the *Pages* tab. Right-click on *Order Manager / c103 / control1* node and press *Edit in Visual Studio*.



The template file will be opened in *Visual Studio*. Replace the existing code after the <% Control %> element with the following:

```
<span class="FieldPlaceholder DataOnly">{ProductID}</span>
          Discount:
          <span class="FieldPlaceholder DataOnly">{Discount}</span>
          >
          Unit Price:
          <span class="FieldPlaceholder DataOnly">{UnitPrice}</span>
          Quantity:
          <span class="FieldPlaceholder DataOnly">{Quantity}</span>
          <i>Extended Price:</i>
          <span class="FieldPlaceholder DataOnly">{ExtendedPrice}</span>
          </div>
</div>
```

Save the file, and refresh the webpage. The Extended Price data field will be displayed in edit form.

Review Order Details X Please review order details information below. Click Edit to change this record, click Delete to delete the record, or click Cancel/Close to return back. Order Details These are the fields of the order details record that can be edited. Product: Rössle Sauerkraut Unit Price: \$45.60 Quantity: 15 Extended Price: Reference Information Additional details about order details are provided in the reference information section. Order Customer Company Name						
Product: Notice Discount: 0.25 Unit Price: \$45.60 Quantity: 15 Extended Price: Reference Information Additional details about order details are provided in the reference information section. Order Customer Company Name Alfreds Futterkiste						
Additional details about order details are provided in the reference information section. Order Customer Company Name Alfreds Futterkiste						
Company Name						
Order Employee Last Suyama Name						
Order Ship Via Company Speedy Express Name						
Product Category Name Produce						
Product Supplier Plutzer Lebensmittelgroßmärkte AG Company Name						
Image: Second state OK Delete Cancel						

SQL Formula

Let's provide an SQL expression evaluated when the data rows of order details are selected from the database.

In the Project Explorer, switch to the Controllers tab and double-click on OrderDetails / Fields / ExtendedPrice node.



Change the following:

Property	New Value
The value of this field is computed at run-time by SQL expression.	true
SQL Formula	<pre>OrderDetails.UnitPrice * OrderDetails.Quantity * (1 - OrderDetails.Discount)</pre>
Values of this field cannot be edited	true
Data Format String	c

Press *OK* to save the field. On the toolbar, press *Browse*. The *Extended Price* field will not be editable, and the value will be presented when the form is rendered.

Order Details These are the fields of the order details record that can be edited.					
Product: Unit Price:	Rössle Sauerkraut 🥢 🛋	Discount: Quantity:	0.25	Extended Price: \$513.00	

SQL Formula provides the highest possible performance for the calculation since it is being evaluated by the database engine. The complexity of calculated fields depends on the capabilities of the database engine. There are numerous built-in functions that the developer can take advantage of.

Fields based on SQL Formula can be sorted and filtered with the highest possible performance as well.

Calculating Field Values Just-in-Time

Extended Price is not recalculated when a user changes values of Unit Price, Discount, or Quantity fields.

Order Details These are the fields of the order details record that can be edited.					
Product: Unit Price:	Rössle Sauerkraut 🥢 🛋	Discount: Quantity:	0.25	Extended Price: \$513.00	

The *SQL Formula* of the *Extended Price* field is evaluated only when the data is selected from the database. If the user makes changes in the browser window, the values will not be submitted to the server until the record is saved. Developers can implement a server-side or client-side calculation that will be performed just-in-time as users change the values of the formula's base fields.

The application framework includes a business rule engine that allows implementing rules in SQL, C#/Visual Basic, or JavaScript.

SQL and C#/Visual Basic business rules require a round-trip between the web browser and the web server. They can look up database information and interact with external systems when necessary.

JavaScript business rules are executed in the browser and provide the highest possible performance when serverside data is not required for calculation.

Let's consider implementing the calculation using all three flavors of business rules. Note that the developer needs only one of them to accomplish just-in-time calculation of *Extended Price*.

SQL Business Rule

In the *Project Explorer*, double-click on *OrderDetails / Fields / ExtendedPrice* node.

a 🚓 OrderDetails
Gommands Gommands
🛛 🧇 Fields
OrderID* (Int32) -> Orders
💫 OrderCustomerID (String(5), read-only) -> Customers
OrderCustomerCompanyName (String(40), read-only)
OrderEmployeeLastName (String(20), read-only)
OrderShipViaCompanyName (String(40), read-only)
ProductID* (Int32) -> Products
ProductProductName (String(40), read-only)
ProductCategoryCategoryName (String(15), read-only)
ProductSupplierCompanyName (String(40), read-only)
12 UnitPrice* (Decimal)
12 Quantity* (Int16)
12 Discount* (Single)
♣. ExtendedPrice* (Currency)

Make the following changes:

Property	New Value
The value of this field is calculated by a business rule expression.	true
Context Fields	UnitPrice,Quantity,Discount

Press OK to save. Right-click on OrderDetails / Business Rules node, and press New Business Rule.



Assign these values:

Property	Value
Туре	SQL
Command Name	Calculate
Phase	Execute
Script	<pre>set @ExtendedPrice = @UnitPrice * @Quantity * (1 - @Discount)</pre>

Press OK to save. On the toolbar, press Browse. Select and start editing an Order Details record.

Order Details These are the fields of the order details record that can be edited.				
Product:	Rössle Sauerkraut 🥢 🛋	Discount:	0.25	
Unit Price:	\$45.60	Quantity:	15	Extended Price: \$513.00

Change the value in *Quantity* field. Press *Enter* or shift the focus to a different field. The *Extended Price* will be updated.

Order Details These are the fields of the order details record that can be edited.					
Product: Unit Price:	Rössle Sauerkraut 🥢 📑	Discount: Quantity:	0.25	Extended Price: \$547.20	

The client library executes *Calculate* action, which causes transfer of field values to the server. The application framework will pass the business rule script along with the parameter values to the database engine for execution. Then, it evaluates parameters and returns changed values to the client web browser.

SQL business rules involve client, application server, and database engine tiers. The advantage of SQL business rules is the ability to access any database information when necessary.

Code Business Rule

The business rule can also be implemented using C# or Visual Basic.

If you have the SQL business rule created in the previous section, then you will need to delete or rename the business rule. Double-click on *OrderDetails / Business Rules / Calculate* node.



Change the Command Name property:

Property	Value
Command Name	DoNotRun

Press OK to save. Alternatively, business rule r100 can be deleted.

Right-click on OrderDetails / Business Rules node, and press New Business Rule.



Assign these values:

Property	Value	
Туре	C# / Visual Basic	
Command Name	Calculate	
Phase	Execute	

Press OK to save.

Code business rule files do not exist until the application generator has created them. On *Project Designer* toolbar, press *Browse*.

When complete, right-click OrderDetails / Business Rules / Calculate business rule node, and press Edit Rule in Visual Studio.



The file will be opened in *Visual Studio*. The entire class definition and parameters of the business rule method are already defined.

Replace the body of the rule with the call of *UpdateFieldValue* method:

```
C#:
using System;
using MyCompany.Data;
namespace MyCompany.Rules
{
    public partial class OrderDetailsBusinessRules : MyCompany.Data.BusinessRules
    {
        [Rule("r101")]
        public void r101Implementation(int? orderID,
            string orderCustomerID, string orderCustomerCompanyName,
            string orderEmployeeLastName, string orderShipViaCompanyName,
            int? productID, string productProductName, string productCategoryCategoryName,
            string productSupplierCompanyName, decimal? unitPrice, short? quantity,
            float? discount, decimal? extendedPrice)
        {
            UpdateFieldValue("ExtendedPrice",
                Convert.ToDouble(unitPrice.Value) * quantity.Value * (1 - discount.Value));
        }
    }
}
Visual Basic:
Imports MyCompany.Data
Imports System
Namespace MyCompany.Rules
    Partial Public Class OrderDetailsBusinessRules
        Inherits MyCompany.Data.BusinessRules
        <Rule("r101")> _
        Public Sub r101Implementation(
                ByVal orderID As Nullable(Of Integer),
                ByVal orderCustomerID As String,
                ByVal orderCustomerCompanyName As String,
                ByVal orderEmployeeLastName As String,
                ByVal orderShipViaCompanyName As String,
                ByVal productID As Nullable(Of Integer),
                ByVal productProductName As String,
                ByVal productCategoryCategoryName As String,
                ByVal productSupplierCompanyName As String,
                ByVal unitPrice As Nullable(Of Decimal),
                ByVal quantity As Nullable(Of Short),
                ByVal discount As Nullable(Of Single),
                ByVal extendedPrice As Nullable(Of Decimal)
            UpdateFieldValue("ExtendedPrice",
                Convert.ToDouble(unitPrice.Value) * quantity.Value * (1 - discount.Value))
```

```
End Sub
```

End Class End Namespace

Save the file, and refresh the webpage.

The same behavior as with the SQL business rule will be exhibited every time a context field is changed in the form. The client library will make a short trip to the web server to perform the calculation. The application framework will call the business rules class method which is linked to the business rule defined in *OrderDetails* data controller.

JavaScript Business Rule

If the values of the base fields are known on the client at the time when a calculation needs to be performed, then the web server round-trip is redundant. JavaScript business rules offer an option to implement complex logic executed by the web browser.

First, disable execution of the previously created C#/Visual Basic business rule. Double-click on OrderDetails / Business Rules / Calculate node.



Change the Command Name property:

Property	Value	
Command Name	DoNotRun	

Press OK to save. Alternatively, business rule r101 can be deleted.

Right-click on OrderDetails / Business Rules node, and press New Business Rule.



Assign these values:

Property	Value
Туре	JavaScript
Command Name	Calculate
Phase	Execute
Script	<pre>[ExtendedPrice] = [UnitPrice] * [Quantity] * (1 - [Discount]); this.preventDefault();</pre>

At runtime, the client library will automatically translate the script into the following JavaScript code:

```
this.updateFieldValue('ExtendedPrice',
    this.selectFieldValue('UnitPrice') *
    this.selectFieldValue('Quantity') *
    (1 - this.selectFieldValue('Discount')));
this.preventDefault();
```

Press OK to save. On the toolbar, press Browse. Open the form view of an order detail.

Order Details These are the fields of the order details record that can be edited.				
Product:	Rössle Sauerkraut 🥢 🛋	Discount:	0.25	
Unit Price:	\$45.60	Quantity:	15	Extended Price: \$513.00

Change a value in one of the fields. Press *Tab* to shift focus away from the field. The *Extended Price* will automatically be updated without performing a server request.

Order Details These are the fields of the order details record that can be edited.				
Product:	Rössle Sauerkraut 🥢 📑	Discount:	0.3	
Unit Price:	\$45.60	Quantity:	15	Extended Price: \$478.80

The call of the method *preventDefault()* will prevent the client library from processing the *Calculate* action on the server.

Implementing a Custom Action

Let's implement a custom action that will apply a discount to all line items of a specific order. Orders are stored in the table *Orders*, and line items are stored in *Order Details*.

Column Name	Data Type	Allow Nulls					
OrderID	int						
CustomerID	nchar(5)						
EmployeeID	int	V					
OrderDate	datetime	V		Or	der Details		
RequiredDate	datetime	V			Column Name	Data Type	Allow
ShippedDate	datetime	V		P	OrderID	int	[
ShipVia	int	V		P	ProductID	int	
Freight	money	V	∞∞		UnitPrice	money	[
ShipName	nvarchar(40)	V			Quantity	smallint	[
ShipAddress	nvarchar(60)	V			Discount	real	[
ShipCity	nvarchar(15)	V					
ShipRegion	nvarchar(15)	V					
ShipPostalCode	nvarchar(10)	V					
ShipCountry	nvarchar(15)	V					

Adding a Custom Action

First, an action needs to be defined in the action group of a data controller.

Start the Project Designer. In the Project Explorer, switch to the Controllers tab. Right-click on Orders / Actions / ag4 (ActionBar) – Edit/Delete action group node, and press New Action.

🛛 🔧 Orders							
> 🐙 Commands							
> 🧇 Fields							
Viev	Views						
a 🧇 Acti	ons						
⊳ 💷 🖇 a	g1 (Grid)						
⊳ 💷 ja	g2 (Form)						
⊳ 💷 ja	g3 (Action	Bar) - New					
⊳ 🛄 a	g4 (Action	Bar) - Edit/Dele	te				
▷ 🗋	Open	Enter					
▷ 8==	List						
⊳ 🐰	Cut	Ctrl+X					
a 🖉	Сору	Ctrl+C					
	Delete	Del					
⊳ 😤 Sł	Rename						
⊳ 😤 Si							
⊳ 🔧 T	Show All	Actions					
alij	New Act	ion					

Assign the following values:

Property	Value
Command Name	Custom
Command Argument	ApplyDiscount
Header Text	Apply a Discount
When Key Selected	Yes
Confirmation	_controller= <mark>OrderDiscount</mark> _title=Specify a Discount _width=500

Press OK to save the action.

The Confirmation property references a data controller called "OrderDiscount". This data controller does not exist in the project – we will create this confirmation data controller from scratch and have it configured to collect the *Discount* value from the user. The data controller will not be based on any database table or view.

Creating the Confirmation Controller

On the Project Explorer toolbar, press the New Controller icon.

💱 🗚 🙆 🤫 🗂 💷
 A Categories A Custom New Controller A Employees

Give this controller a name:

Property	Value
Name	OrderDiscount

Press OK to save.

Right-click on OrderDiscount / Fields node, and press New Field.



Assign the following values:

Property	Value
Name	CustomerCompanyName
Туре	String
Length	50
The value of this field is calculated by a business rule expression.	True
Label	Customer Company Name
Values of this field cannot be edited	True

Press OK to save.

Add another field with these values:

Property	Value
Name	Discount
Туре	Single
Label	Discount

Save the field.

Generate the app and select an order. On the action bar, press the *Apply a Discount* action.

Quick Find	2	New Ord	ders 😡	Edit 🗙 🛛	Delete A	Apply a	Discoun	t Actions \	Report View:	Orders
Customer Company Name	Employee Last Name	Order Date	Required Date	Shipped Date	Ship Via Company Name		Freight	Ship Name	Ship Address	Ship C
Vins et alcools Chevalier	Buchanan 🕥	7/4/1996	8/1/1996		Federal Shipping	0	\$32.38	Vins et alcools Chevalier	59 rue de l'Abbaye	Reims

A modal form with two empty fields, *Customer Company Name* and *Discount*, will be displayed.

Specify a Discount		x
Customer Company Name Discount *	N/A	
* - indicates a required f	ield	OK Cancel

Let's populate *Customer Company Name* with the name of the company associated with the selected order and initialize *Discount* with the average discount of the order details.

In the Project Explorer, right-click on OrderDiscount / Business Rules node, and press New Business Rule.

a 🝓 OrderDiscount			
🔉 😡 Commands			
🛛 🧼 Fields			
String(50), read-only			
12 Discount* (Single)			
Views			
> 🧇 Actions			
Business Rules			
⊳ 🔧 📰 List			
▷ �☆ ▷ �☆ New Business Rule			

Assign the following values:

Property	Value
Туре	SQL
Command Name	New
Phase	Execute
Script	<pre>set @CustomerCompanyName = @Context_CustomerCompanyName select @Discount = avg(Discount) from "Order Details" where OrderID = @Context_OrderID</pre>

Press OK to save the business rule.

The parameter @CustomerCompanyName refers to the *CustomerCompanyName* field of the confirmation data controller.

The parameter <code>@Context_CustomerCompanyName</code> refers to the *CustomerCompanyName* field of the *Orders* data controller.

The application framework will pass the script for execution to the database engine when the action *Custom / ApplyDiscount* is activated by the user. The result is shown in the next screenshot.

Specify a Discount		x
Customer Company Name Discount *	Chop-suey Chinese	
* - indicates a required fie	eld	OK Cancel

If the user clicks *OK*, nothing will happen. The application does not know what to do with a "Custom" action with argument of "ApplyDiscount".

Creating an SQL Business Rule to Handle the Action

Now that an action and controller are in place to capture the user input, a business rule needs to be created to apply the specified discount to all *OrderDetails* data rows associated with the selected order.

Right-click on Orders / Business Rules node, and press New Business Rule.



Use these values:

Property	Value
Туре	SQL
Command Name	Custom
Command Argument	ApplyDiscount
Phase	Execute
Script	<pre> apply discount to order details update "Order Details" set Discount = @Parameters_Discount where OrderID = @OrderID</pre>

force refresh of child views
<pre>set @Result_RefreshChildren = 1</pre>

Press OK to save.

The first statement in the SQL script will update [Order Details].[Discount] column where the OrderID matches the selected order. The value of the discount is referenced by @Parameters_Discount parameter.

The second statement instructs the client library to refresh the child data views of the master data view *Orders*. This will cause *Order Details* data view to reflect the updated discount.

On the *Project Designer* toolbar, press *Browse*. Navigate to the *Orders* page and select an order. A list of related order details will be displayed below. Take note of the discounts of the order details.

Quick Find	Q	📑 New O	orders 🛛 🗔 Edit	🗙 Delete	Apply a Discou	nt Actions 🗸	Report 🗸 Vie	w: Orders
🗼 A filter has b	een applied.	Order Date	equals 7/11/19	96.				:
Customer Company Name	Employee Last Name	Order Date 🍸	Required Ship Date Date	Company	/ Freight S	Ship Name Ship	Address	Ship City
Chop-suey Chinese	Buchanan 🄇	7/11/1996	6 8/8/1996 7/23	/1996 United Package	\$ 22.98	Chop-suey Hau Chinese	ptstr. 31	Bern
							Showing 1-1	1 of 1 items
Order Details	:							
This is a list of o								
🥑 Quick Find	ç	🖃 New O	order Details A	ctions 🗸 🛛 Rep	port 🗸		View: Ord	ler Details
	ب Unit Price Q		Order	ctions ∨ Rep Order Employee Last Name	Order Ship Via Company Name	Product Category Name	View: Ord Product Supplier Company Name	
		uantity Disc	Order Customer Company	Order Employee	Order Ship Via Company	Category	Product Supplier	Extended Pri
Product Name Guaraná	Unit Price Q	uantity Disc	Order Customer Company Name	Order Employee Last Name	Order Ship Via Company Name United	Category Name	Product Supplier Company Name Refrescos Americanas	ler Details Extended Pri \$45. \$342.
Product Name Guaraná Fantástica	Unit Price Q \$3.60	uantity Disc	Order Customer Company Name 0.15 Chop-suey Chinese	Order Employee Last Name Buchanan	Order Ship Via Company Name United Package United	Category Name Beverages	Product Supplier Company Name Refrescos Americanas LTDA	Extended Pri \$45.

On the action bar of *Orders* grid view, press *Apply a Discount*. The confirmation modal popup will appear, displaying the current *Customer Company Name* and the average discount. Enter a discount of ".25".

Specify a Discount		×
Customer Company Name Discount *	Chop-suey Chinese	
* - indicates a required fie	eld	OK Cancel

Press *OK*, and the specified discount will be applied to all records in *Order Details* table that belong to the selected order.

	of order det	alls,							
🥑 Quick F	find	🖻 🖻	New Ord	der Details Act	tions 🗸 🛛 Rep	ort 🗸		View: Or	der Details 🕚
Product Name	Unit Price	Quantity	Discount	Order Customer Company Name	Order Employee Last Name	Order Ship Via Company Name	Product Category Name	Product Supplier Company Name	Extended Pri
Guaraná Fantástica	\$3.60	15	0.25	Chop-suey Chinese	Buchanan	United Package	Beverages	Refrescos Americanas LTDA	\$40.
Pâté chinois	\$19.20	21	0.25	Chop-suey Chinese	Buchanan	United Package	Meat/Poultry	Ma Maison	\$302.
Longlife Tofu	\$8.00	21	0.25	Chop-suey Chinese	Buchanan	United Package	Produce	Tokyo Traders	\$126.

Creating "Code" Business Rule to Handle the Action

Instead of using SQL, you may also create a code business rule written in C# or Visual Basic to handle the calculation.

If you have implemented the previous SQL business rule, you will need to delete it.

Right-click on Orders / Business Rules / Custom, ApplyDiscount (Sql / Execute) - r100 business rule node and press Delete.



Right-click on Orders / Business Rules node and press New Business Rule.



Assign these values:

Property	Value
Туре	C# / Visual Basic
Command Name	Custom
Command Argument	ApplyDiscount
Phase	Execute

Save the rule. "Code" business rules do not have a script stored in the data controller definition file. A code file must be created in the project. The application generator will create an initial "empty" business rule code file as soon as the project is generated.

On the Project Designer toolbar, press Generate.

When complete, right-click on Orders / Business Rules / Custom, ApplyDiscount (Code / Execute) – r100 node and press Edit Rule in Visual Studio.



The file will be opened in *Visual Studio*. The generator has created a template for the business rule. Replace the existing code with the following:

```
C#:
```

```
using System;
using MyCompany.Data;
namespace MyCompany.Rules
{
    public partial class OrdersBusinessRules : MyCompany.Data.BusinessRules
    {
        /// <summary>
        /// This method will execute in any view for an action
        /// with a command name that matches "Custom" and argument that matches "ApplyDiscount".
        /// </summary>
        [Rule("r100")]
        public void r100Implementation(
                    int? orderID,
                    string customerID,
                    string customerCompanyName,
                    int? employeeID,
                    string employeeLastName,
                    DateTime? orderDate,
                    DateTime? requiredDate,
                    DateTime? shippedDate,
                    int? shipVia,
                    string shipViaCompanyName,
                    decimal? freight,
                    string shipName,
                    string shipAddress,
                    string shipCity,
                    string shipRegion,
                    string shipPostalCode,
```

```
string shipCountry)
        {
            // This is the placeholder for method implementation.
            using (SqlText applyDiscount = new SqlText(
                "update [Order Details] " +
                "set Discount = @Discount " +
                "where OrderID = @OrderID"))
            {
                applyDiscount.AddParameter("@Discount", SelectFieldValue("Parameters_Discount"));
                applyDiscount.AddParameter("@OrderID", orderID);
                applyDiscount.ExecuteNonQuery();
            }
            Result.RefreshChildren();
        }
    }
}
Visual Basic:
Imports MyCompany.Data
Imports System
Imports MyCompany.Rules
Namespace MyCompany.Rules
    Partial Public Class OrdersBusinessRules
        Inherits MyCompany.Data.BusinessRules
        ''' <summary>
        ''' This method will execute in any view for an action
        ''' with a command name that matches "Custom" and argument that matches "ApplyDiscount".
        ''' </summary>
        <Rule("r100")> _
        Public Sub r100Implementation( _
                    ByVal orderID As Nullable(Of Integer), _
                    ByVal customerID As String, _
                    ByVal customerCompanyName As String, _
                    ByVal employeeID As Nullable(Of Integer), _
                    ByVal employeeLastName As String, _
                    ByVal orderDate As Nullable(Of DateTime), _
                    ByVal requiredDate As Nullable(Of DateTime), _
                    ByVal shippedDate As Nullable(Of DateTime), _
                    ByVal shipVia As Nullable(Of Integer), _
                    ByVal shipViaCompanyName As String,
                    ByVal freight As Nullable(Of Decimal), _
                    ByVal shipName As String, _
                    ByVal shipAddress As String, _
                    ByVal shipCity As String, _
                    ByVal shipRegion As String, _
                    ByVal shipPostalCode As String, _
                    ByVal shipCountry As String)
            'This is the placeholder for method implementation.
            Using applyDiscount As SqlText = New SqlText(
                    "update [Order Details] " +
                    "set Discount = @Discount " +
                    "where OrderID = @OrderID"
                    )
                applyDiscount.AddParameter("@Discount", SelectFieldValue("Parameters_Discount"))
                applyDiscount.AddParameter("@OrderID", orderID)
                applyDiscount.ExecuteNonQuery()
```

```
End Using
Result.RefreshChildren()
End Sub
End Class
End Namespace
```

Save the file, and refresh the web page. The *Assign a Discount* action will function in exactly the same way as the version with the SQL business rule.