



Declarative Code Formulas

We have a web application generated with *Web Site Factory*, modified to demonstrate declarative code formulas in action. First, we will show to you how it works, and then we will explain how it can be done.

HOW IT WORKS

Suppose you want to adjust an order placed by a customer. Go to *Orders* screen by pressing the *Orders* tab at the top of the screen, under *Customers*. Select an order by clicking on the *Customer Company Name*. The detail view of the order should appear. Click on the *Order Details* tab inside the *Orders* page. Press *New Order Details* button on the action bar. In *Product Name*, press (*select*) and choose any *Product Name* with the lookup. The *Unit Price* is automatically transferred from the *Product Name*. Select a *Quantity* and *Discount*. If we hit *Enter* on the keyboard, the price is automatically calculated under *Line Total*.

Home > Customers > Orders

Orders

Orders | Order Details

Please fill this form and click OK button to create a new order details record. Click Cancel to return to the previous screen.

Record ▾ View: New Order Details ▾

New Order Details

Complete the form. Make sure to enter all required fields.

Product Name *
Uncle Bob's Organic Dried Pears

Unit Price *
\$30.00

Quantity *
1

Discount *
0

Line Total
\$30.00

* - indicates a required field

OK Cancel

If we set *Quantity* to “10”, and “0.01” in *Discount*, and press *Enter* on the keyboard, the *Line Total* changes to reflect the altered numbers. Press the *Ok* button to save the record, and we can see the new record in the list, including *Line Total* as the rightmost column.

Orders Order Details										
This is a list of order details.										
Quick Find	New Order Details		Edit		Delete		Actions		Report	View: Order 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	Line Total	
Uncle Bob's Organic Dried Pears	\$30.00	10	0.01	Hanari Carnes	Peacock	United Package	Produce	Grandma Kelly's Homestead	\$297.00	
Jack's New England Clam Chowder	\$7.70	10	0	Hanari Carnes	Peacock	United Package	Seafood	New England Seafood Cannery	\$77.00	
Manjimup Dried Apples	\$42.40	35	0.15	Hanari Carnes	Peacock	United Package	Produce	G'day, Mate	\$1,261.40	
Louisiana Fiery Hot Pepper Sauce	\$16.80	15	0.15	Hanari Carnes	Peacock	United Package	Condiments	New Orleans Cajun Delights	\$214.20	
Showing 1-4 of 4 items Refresh										

If we click on the dropdown next to *Product Name* and press the *Edit* button, we can edit in-place. *Line Total* functions in this method as well. You can make changes, and when you hit the *Enter* button on your keyboard, the *Line Total* will be updated.

Orders Order Details									
This is a list of order details.									
Quick Find	Record								View: Order 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	Line Total
Uncle Bob's Organic Dried Pears <input type="text" value=""/>	\$30.09	10	0.01	Hanari Carnes	Peacock	United Package	Produce	Grandma Kelly's Homestead	\$297.89
<input type="button" value="Save"/> <input type="button" value="Cancel"/>									
Jack's New England Clam Chowder	\$7.70	10	0	Hanari Carnes	Peacock	United Package	Seafood	New England Seafood Cannery	\$77.00
Manjimup Dried Apples	\$42.40	35	0.15	Hanari Carnes	Peacock	United Package	Produce	G'day, Mate	\$1,261.40
Louisiana Fiery Hot Pepper Sauce	\$16.80	15	0.15	Hanari Carnes	Peacock	United Package	Condiments	New Orleans Cajun Delights	\$214.20
Showing 1-4 of 4 items Refresh									

Press the *Save* button to save changes to the record.

We'll show you how to create this sort of functionality without writing a single line of code.

HOW IT IS DONE

We have a freshly generated application generated from *Web Site Factory* premium project. We can see a list of Order Details. Every item lets us know *Price*, *Discount*, *Quantity*, and many other fields. What is missing is a *Line Total*. We know the quantity, price, and discount, which allow us to easily calculate the *Line Total*.

This is a list of order details.

Order Customer #	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
BERGS	Queso Cabrales	\$14.00	13	0	Berglunds snabbköp	Buchanan	Federal Shipping	Dairy Products	Cooperativa de Quesos 'Las Cabras'
BERGS	Singaporean Hokkien Fried Mee	\$9.80	100	0	Berglunds snabbköp	Buchanan	Federal Shipping	Grains/Cereals	Leka Trading
BERGS	Mozzarella di Giovanni	\$34.80	5	0	Berglunds snabbköp	Buchanan	Federal Shipping	Dairy Products	Formaggi Fortini s.r.l.
TOMSP	Tofu	\$18.60	9	0	Toms Spezialitäten	Suyama	Speedy Express	Produce	Mayumi's
TOMSP	Manjimup Dried Apples	\$42.40	40	0	Toms Spezialitäten	Suyama	Speedy Express	Produce	G'day, Mate
HANAR	Jack's New England Clam Chowder	\$7.70	10	0	Hanari Carnes	Peacock	United Package	Seafood	New England Seafood Cannery
HANAR	Manjimup Dried Apples	\$42.40	35	0.15	Hanari Carnes	Peacock	United Package	Produce	G'day, Mate
HANAR	Louisiana Fiery Hot Pepper Sauce	\$16.80	15	0.15	Hanari Carnes	Peacock	United Package	Condiments	New Orleans Cajun Delights
VICTE	Gustaf's Knäckebröd	\$16.80	6	0.05	Victualles en stock	Leverling	Speedy Express	Grains/Cereals	PB Knäckebröd AB
VICTE	Ravioli Angelo	\$15.60	15	0.05	Victualles en stock	Leverling	Speedy Express	Grains/Cereals	Pasta Buttini s.r.l.

<< Previous | Page: 1 2 3 4 5 6 7 8 9 10 ... | Next >> Items per page: 10, 15, 20, 25 | Showing 1-10 of 2155 items | Refresh

Run *Code OnTime* by clicking on its icon on your desktop. Click on the project name you wish to edit in the list. Press the *Design* button. In the *All Controllers* tab, select the *OrderDetails* data controller. At the top, switch to the *Commands* tab. Select the command called *command1* to go to its details view. Press the *Edit* button. Copy the text in the *Text* box.

Project Designer Close

Home > Controller: OrderDetails > Command: command1

Command Field Outputs Views

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

Record View: Command

General

Id of the command. CommandId * command1

Controller OrderDetails

Text

Specify the command text and identify the event that will cause the command to execute. Note that the only supported command type for *Select* commands is *Text*.

Text *
 select
 , "OrderDetails", "OrderID" "OrderID"
 , "Order", "CustomerID" "OrderCustomerID"
 , "OrderCustomer", "CompanyName" "OrderCustomerCo
 mpanyName"
 , "OrderEmployee", "LastName" "OrderEmployeeLastNam
 e"
 , "OrderShipVia", "CompanyName" "OrderShipViaCompan
 yName"
 , "OrderDetails", "ProductID" "ProductID"
 , "Product", "ProductName" "ProductProductName"

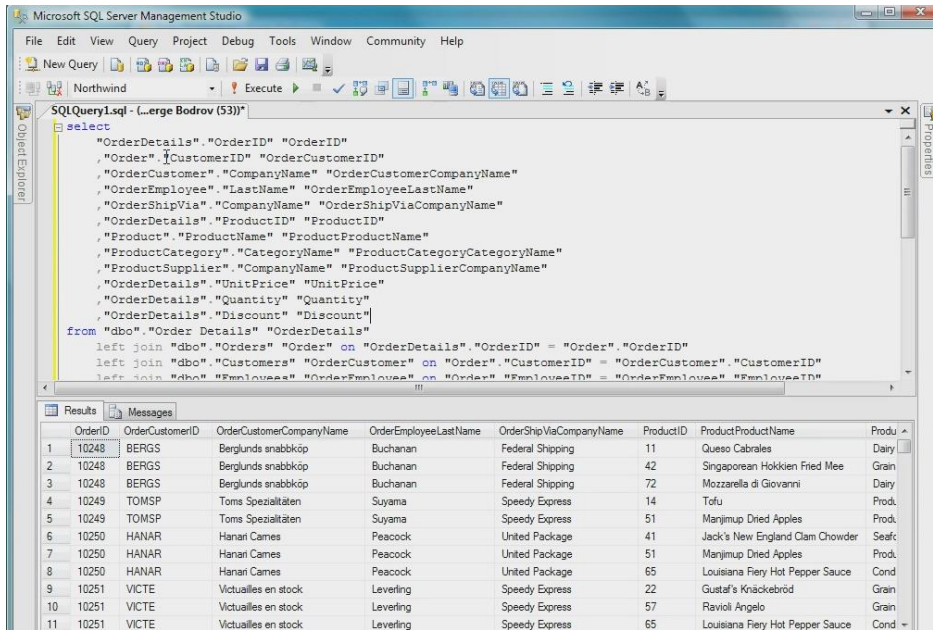
Type Text

Event * Select

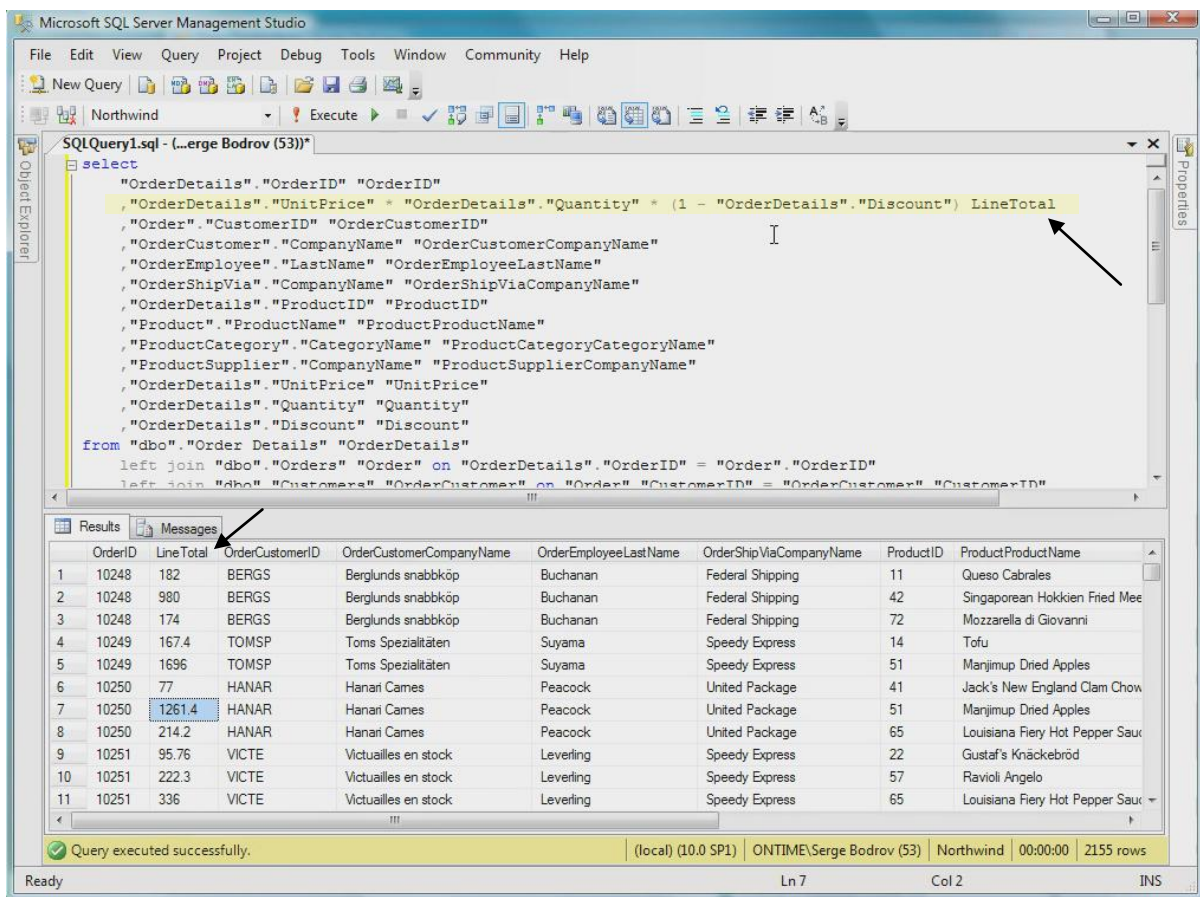
* - indicates a required field

OK Delete Cancel

This command was automatically generated by the code generator. Open *Microsoft SQL Server Management Studio* and create a new query. Paste in the code, so that we can see the results of this command, and press *Execute*.



What we want to do is expand the code to add an additional column. We will place this column after *OrderID* column. This column will multiply *UnitPrice* by *Quantity*, and then multiply by one minus the *Discount*. This column will have the name *Line Total*, as you can see in the image below. If you run this query by pressing the Execute button, *Line Total* column appears.



We have a choice. We can take the new command and replace the original command, or we can simply take the formula needed for *Line Total* column and copy it into the *Designer* field list. The formula is displayed below.

```
select
"OrderDetails"."OrderID" "OrderID"
,"OrderDetails"."UnitPrice" * "OrderDetails"."Quantity" * (1 - "OrderDetails"."Discount") LineTotal
,"Order"."CustomerID" "OrderCustomerID"
,"OrderCustomer"."CompanyName" "OrderCustomerCompanyName"
,"OrderEmployee"."LastName" "OrderEmployeeLastName"
,"OrderShipVia"."CompanyName" "OrderShipViaCompanyName"
,"OrderDetails"."ProductID" "ProductID"
,"Product"."ProductName" "ProductProductName"
,"ProductCategory"."CategoryName" "ProductCategoryCategoryName"
,"ProductSupplier"."CompanyName" "ProductSupplierCompanyName"
,"OrderDetails"."UnitPrice" "UnitPrice"
,"OrderDetails"."Quantity" "Quantity"
,"OrderDetails"."Discount" "Discount"
from "dbo"."Order Details" "OrderDetails"
left join "dbo"."Orders" "Order" on "OrderDetails"."OrderID" = "Order"."OrderID"
left join "dbo"."Customers" "OrderCustomer" on "Order"."CustomerID" = "OrderCustomer"."CustomerID"
```

Switch back to *Code OnTime*. Press the *Cancel* button to go back to *Commands*, and then click on the *Fields* tab at the top. On the *Action Bar*, press *New | New Field*. For *Name*, write in *LineTotal*. For *field Type*, choose *Currency* from the dropdown. Check the option “*The value of this field is computed at run-time*”, and paste in the formula you created earlier in the *SQL Formula* textbox that appears.

The *Label* will be *Line Total*. In the *Miscellaneous* section, check the boxes next to “*Allow Query-by-Example*” and “*Allow Sorting*”. Press the *Ok* button to save changes.

Now we need to add the field to the views available in our application. Click on the *Views* tab at the top of the page. Select *createForm1* in the list. Press on the *Data Fields* tab. Press *New | New Data Field*.

For *Field Name*, press (*select*) and choose *LineTotal*. For *Category*, press (*select*) and choose *New Order Details*. Press the *Ok* button to save changes.

Project Designer Close

Home > Controller: OrderDetails > View: createForm1

View Categories Styles **Data Fields**

Please fill this form and click OK button to create a new data field record. Click Cancel to return to the previous screen.

View: **New Data Field** ▾

* - indicates a required field **OK** Cancel

New Data Field

Complete the form. Make sure to enter all required fields.

Field Name *
LineTotal

Category
New Order Details

Alias
(select)

Click on the back icon in the top left corner to go back to *Views*. Click on *editForm1* in the list. Press the *Data Fields* tab at the top. On the action bar, press *New | New Data Field*.

For *Field Name*, press *(select)* and choose *LineTotal*. For *Category*, press *(select)* and choose *Reference Information*. Press the *Ok* button to save your changes.

Project Designer Close

Home > Controller: OrderDetails > View: editForm1

View Categories Styles **Data Fields**

Please fill this form and click OK button to create a new data field record. Click Cancel to return to the previous screen.

View: **New Data Field** ▾

* - indicates a required field **OK** Cancel

New Data Field

Complete the form. Make sure to enter all required fields.

Field Name *
LineTotal

Category
Reference Information

Alias
(select)

Again, press the back icon in the top left corner to go back to *Views*. Click on *grid1* in the list. Press the *Data Fields* tab. On the action bar, press *New | New Data Field*.

For *Field Name*, press *(select)* and choose *LineTotal*. Selecting a category is not necessary for *grid1*. Press the *Ok* button to save changes.

Project Designer Close

Home > Controller: OrderDetails > View: grid1

View Categories Styles **Data Fields**

Please fill this form and click OK button to create a new data field record. Click Cancel to return to the previous screen.

View: **New Data Field** ▾

* - indicates a required field OK Cancel

New Data Field
Complete the form. Make sure to enter all required fields.

Field Name *
LineTotal

Category
(select)

Alias
(select)

This field is probably not something you want your end users to edit. Press the back icon in the upper left corner, and then click on the *Fields* tab. Click on the dropdown next to *LineTotal* field, and press the *Edit* button. Check the *Read Only* checkbox and press *Save* to save changes. We also need to change one more thing. Click on *Line Total* field name, and press the *Edit* button in the details view. Scroll down to the *Presentation* section, and change *Data Format String* field to “{0:c}”. Press the *Ok* button to save your changes.

Presentation
Presentation interface properties of the field.

A data format string is applied to the field value on the client via JavaScript *String.format* function. You can override the data format string on the data field level in views.

Label *
Line Total

Values of this field cannot be edited.

Show In Summary

HTML encoding

Data Format String
{0:c}

Use data format strings compatible with *String.format* functions.

Let’s try out our changes. On the action bar, press the *Preview* button. A web page of *Order Details* will appear.

Home > Order Details

Order Details

This is a list of order details.

Quick Find New Order Details Actions Report View: **Order Details** ▾

Order Customer#	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	Line Total
BERGS	Queso Cabrales	\$14.00	13	0	Berglunds snabbköp	Buchanan	Federal Shipping	Dairy Products	Cooperativa de Quesos 'Las Cabras'	\$182.00
BERGS	Singaporean Hokkien Fried Mee	\$9.80	100	0	Berglunds snabbköp	Buchanan	Federal Shipping	Grains/Cereals	Leka Trading	\$980.00
BERGS	Mozzarella di Giovanni	\$34.80	5	0	Berglunds snabbköp	Buchanan	Federal Shipping	Dairy Products	Formaggi Fortini s.r.l.	\$174.00
TOMSP	Tofu	\$18.60	9	0	Toms Spezialitäten	Suyama	Speedy Express	Produce	Mayumi's	\$167.40
TOMSP	Manjimup Dried Apples	\$42.40	40	0	Toms Spezialitäten	Suyama	Speedy Express	Produce	G'day, Mate	\$1,696.00

Now we can see the *Line Total* column displayed at the very right with a currency symbol. The field is read-only. Click on the dropdown next to *Order Customer #* and press the *Edit* button, and *Line Total* will not be modifiable.

BERGS	Mozzarella di Giovanni	\$34.80	5	0	Berglunds snabbköp	Buchanan	Federal Shipping	Dairy Products	Formaggi Fortini s.r.l.	\$174.00	
Save		Cancel									

If you look at the detail view by clicking on *the Order Customer #*, you can see *Line Total* listed under *Reference Information*.

Reference Information

Additional details about order details are provided in the reference information section.

<p>Order Customer Company Name Berglunds snabbköp</p> <p>Order Employee Last Name Buchanan</p> <p>Order Ship Via Company Name Federal Shipping</p> <p>Product Category Name Grains/Cereals</p> <p>Product Supplier Company Name Leka Trading</p> <p>Line Total \$980.00</p>	
---	--

* - indicates a required field

OK Delete Cancel

If you create a new *Order Detail* by pressing *New Order Details* button on the action bar, you can see *Line Total* at the bottom.

Please fill this form and click OK button to create a new order details record. Click Cancel to return to the previous screen.

Record ▾ View: **New Order Details** ▾

New Order Details

Complete the form. Make sure to enter all required fields.

<p>Order Customer # *</p> <p>Product Name *</p> <p>Unit Price *</p> <p>Quantity *</p> <p>Discount *</p> <p>Line Total N/A</p>	
---	--

* - indicates a required field

OK Cancel

When you press *(select)* under *Product Name*, and choose a product, the *Unit Price* does not auto-populate. If you enter in *Unit Price*, *Quantity*, and *Discount*, *Line Total* is not calculated until you save the record.

Switch back to *Code OnTime*, and view the list of *Fields* in controller *OrderDetails*. In the list, select the field *ProductID*. Press the *Edit* button. Scroll down to the *Lookup* section. Now you need to write in the *Copy* condition in the *Copy* textbox. This will be *"UnitPrice=UnitPrice"*.

Lookup

Lookup settings can be based on another data controller or defined as static items. Follow the link to learn more about [lookup item styles](#).

You can list static lookup items on the *Items* tab.

Property *Copies* specifies the fields that must be copied from the lookup data row when a lookup value is selected. Specify one copy source per line in format *FieldName=LookupFieldName*.

Items Style
Lookup

Items Data Controller
Products

Data Value Field
(select)

Data Text Field
(select)

New Data View
createForm1

Copy
UnitPrice=UnitPrice|

Press the *Save* button to save your changes, and then press the *Preview* button on the action bar. Another webpage should appear with *Order Details* page.

Press the *New Order Details* button on the action bar. Press *(select)* under *Product Name* and choose a product. You can see that *Unit Price* has been copied in from *Product*.

New Order Details

Complete the form. Make sure to enter all required fields.

Order Customer # *
(select)

Product Name *
Grandma's Boysenberry Spread

Unit Price *
\$25.00

Quantity *
|

Discount *
|

Line Total
N/A

* - indicates a required field

OK Cancel

However, *Line Total* is still not calculated as you type in *Quantity* and *Discount*.

Switch back to *Code OnTime*. On the list of *Fields*, click on *Line Total*. Press the *Edit* button, and scroll down to the *Dynamic Properties* section. Check the box next to "Calculate field value on server". In the *Code Formula* textbox that appears underneath the checkbox, type in "unitPrice * Convert.ToDecimal(quantity) * (1 - discount)" without the quotation marks. The lower case of the first letter is needed to code in C#. Visual Basic developers can write it in upper case. *Quantity* needs to be converted to decimal to make sure it calculates properly. In *Context Fields* box, type in *UnitPrice*, *Quantity*, *Discount* to make sure *Line Total* updates whenever those three fields are changed.

Press the *Save* button to save changes, and then press the *Preview* button on the action bar. A webpage with *Order Details* page will appear.

Press *New Order Details* on the action bar. For *Product Name*, press (*select*) and select a product. The *Unit Price* has automatically been inserted. In the *Quantity* field, type “4”. For *Discount*, type in “0” and hit the *Enter* button on your keyboard. You will see that *Line Total* will automatically calculate to reflect the values you inserted. If you change *Discount* to “0.15” and press *Enter* again, *Line Total* will change again.

Record View: **New Order Details**

New Order Details
Complete the form. Make sure to enter all required fields.

Order Customer # *
(select)

Product Name *
Chef Anton's Cajun Seasoning

Unit Price *
\$22.00

Quantity *
4

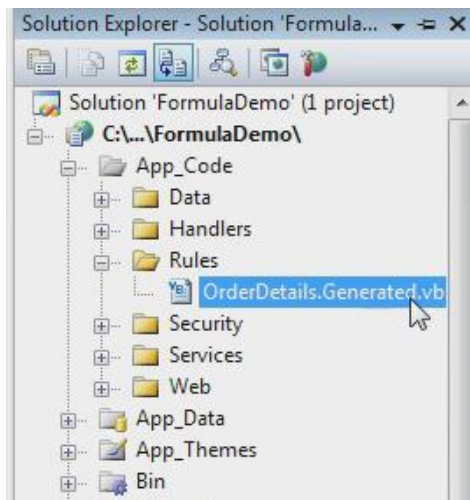
Discount *
0.15

Line Total
\$74.80

* - indicates a required field

OK Cancel

Let’s take a look at this business rule. If we open the project folder for the project in *Microsoft Visual Studio*, you can see that rule *OrderDetails.Generated.vb* has been created in *App_Code/Rules* folder.



If you open this file, you will see the method in the class *OrderDetailsBusinessRules*, and the name of the method is *CalculateOrderDetails*. The code we made earlier in this article is pasted as-is into the generated method.

```
App_Code/Rules/OrderDetails.Generated.vb
OrderDetailsBusinessRules CalculateOrderDetails
1 Imports MyCompany.Data
2 Imports System
3 Imports System.Collections.Generic
4 Imports System.Data
5 Imports System.Linq
6
7 Namespace MyCompany.Rules
8
9     Partial Public Class OrderDetailsBusinessRules
10         Inherits MyCompany.Data.BusinessRules
11
12         <ControllerAction("OrderDetails", "Calculate", "LineTotal")> _
13         Public Sub CalculateOrderDetails(ByVal orderID As Nullable(Of Integer), ByVal orderCustomerID As Str
14             UpdateFieldValue("LineTotal", unitPrice * Convert.ToDecimal(quantity) * (1 - discount))
15         End Sub
16     End Class
17 End Namespace
18
```

Code OnTime LLC

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