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# Use Object Database db4o

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## Introduction

The following information is from db4o web site: db4o is an open source object database that enables Java and .NET developers to store and retrieve any application object with only one line of code, eliminating the need to predefine or maintain a separate, rigid data model.

For more information on db4o, visit <http://www.db4o.com/>

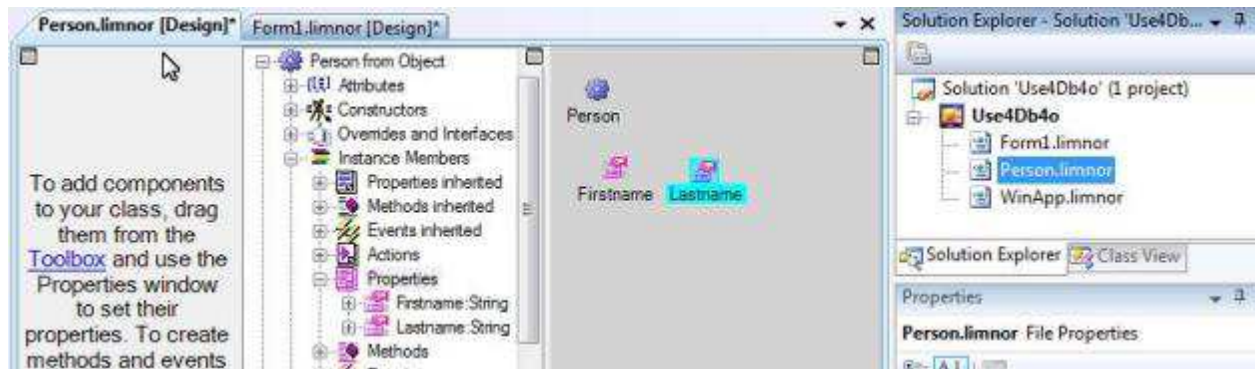
We will create a sample application to use db4o. The sample application demonstrates the using of 3<sup>rd</sup> party .Net libraries in a project.

We followed db4o document on <http://refcardz.dzone.com/refcardz/getting-started-db4o> and used SODA Queries approach described in the document to use the db4o.

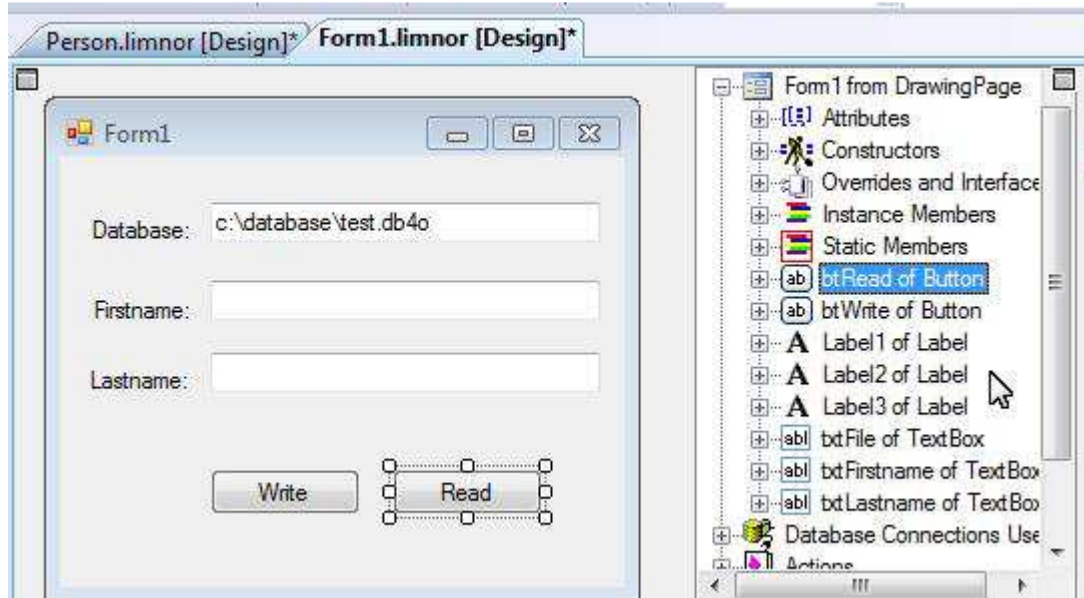
## Sample Project

### Windows Form project

A sample Windows Form project is created. A class named Person is created. Two properties, Firstname and Lastname, are added to the Person class. We will save a Person object to an Object database and then read it back from the database, using db4o.



In the form, we use a text box to allow specifying a full file name and path for the database. Two buttons are used; one button for testing writing to the database; one button for testing reading from the database. Two text boxes for the Firstname and Lastname properties, respectively, of a Person object.

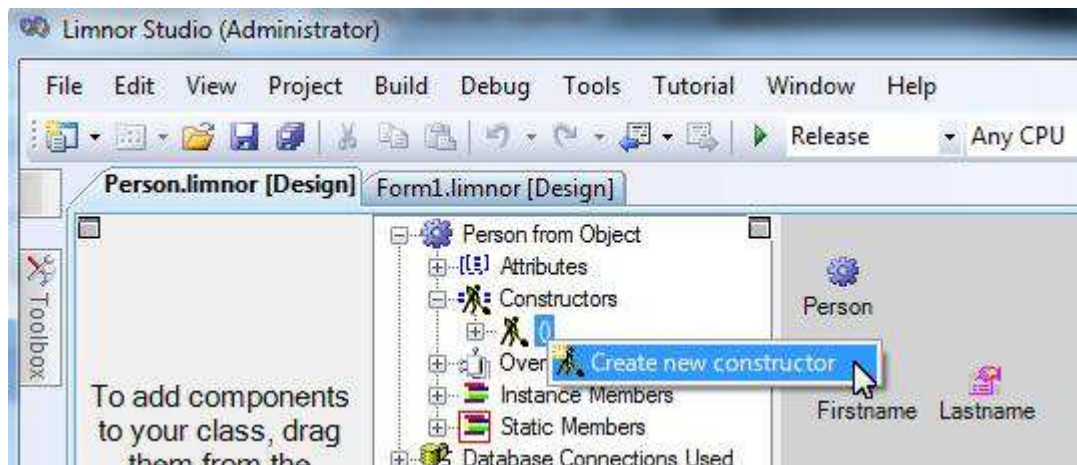


### Create a constructor

We added two properties, Firstname and Lastname, to the Person class. For the creation of properties, see <http://www.limnor.com/support/Limnor%20Studio%20-%20User%20Guide%20-%20Part%20IV.pdf>.

We now add a new constructor to the Person class for easier creation of Person instances. The new constructor will take parameters for setting properties Firstname and Lastname. Later we will see the use of this new constructor.

A new constructor must be derived from an existing constructor. Right-click the default constructor "()"; choose "Create new constructor":

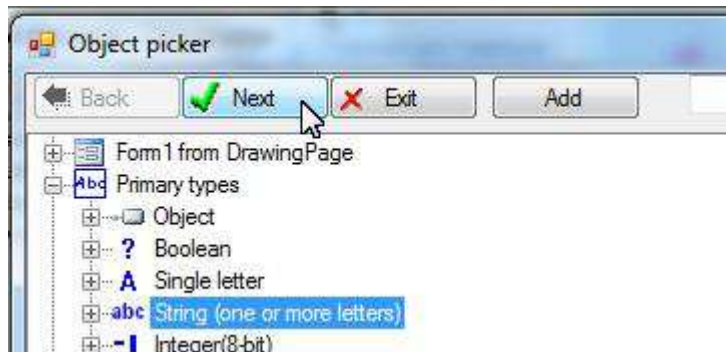


The new constructor will be derived from the default constructor "()". The Method Editor is launched to edit the new constructor.

Right-click the Parameter Pane and choose "Add parameter":



Select String as the parameter type:



Add another String parameter:

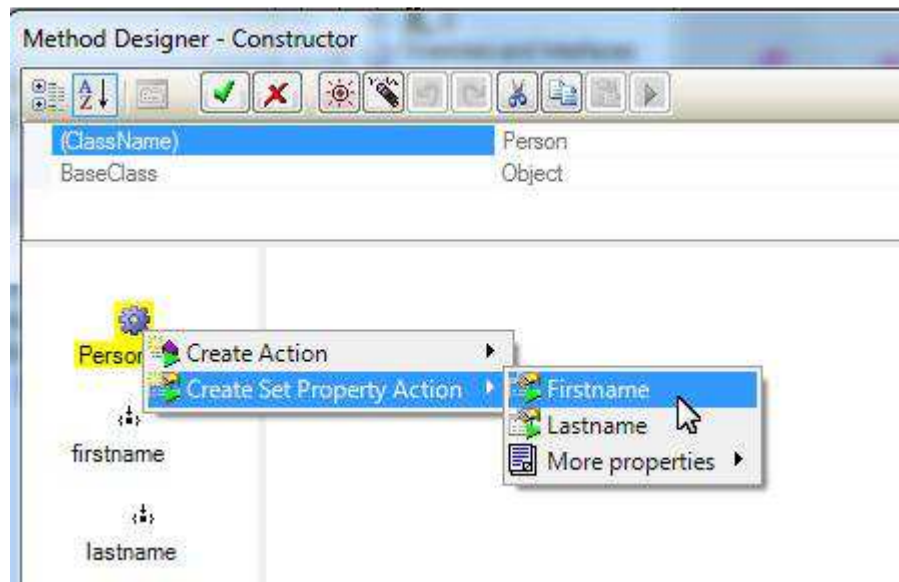


Rename the parameters:

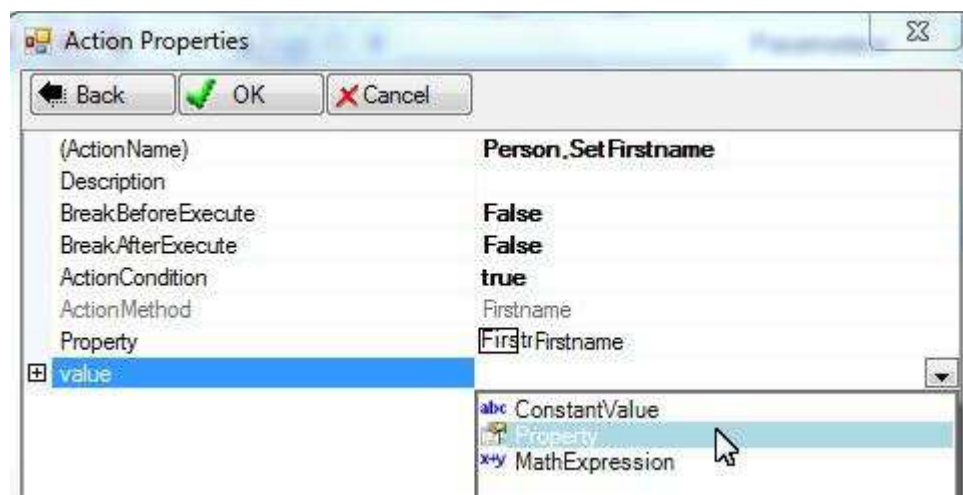


For this constructor, we simply pass the parameters to the properties.

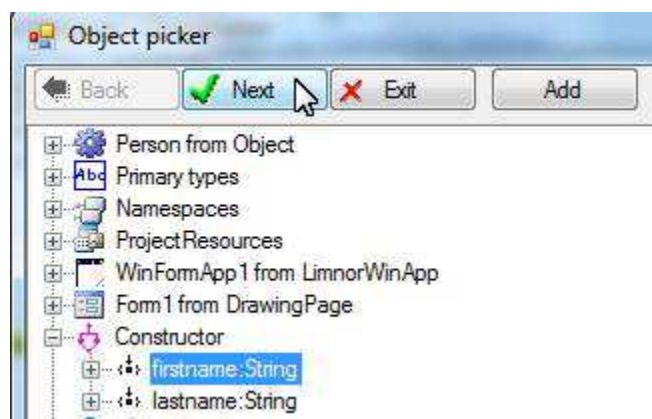
Right-click the Person object; choose "Create Set Property Action"; choose Firstname:



For “value”, select “Property”:

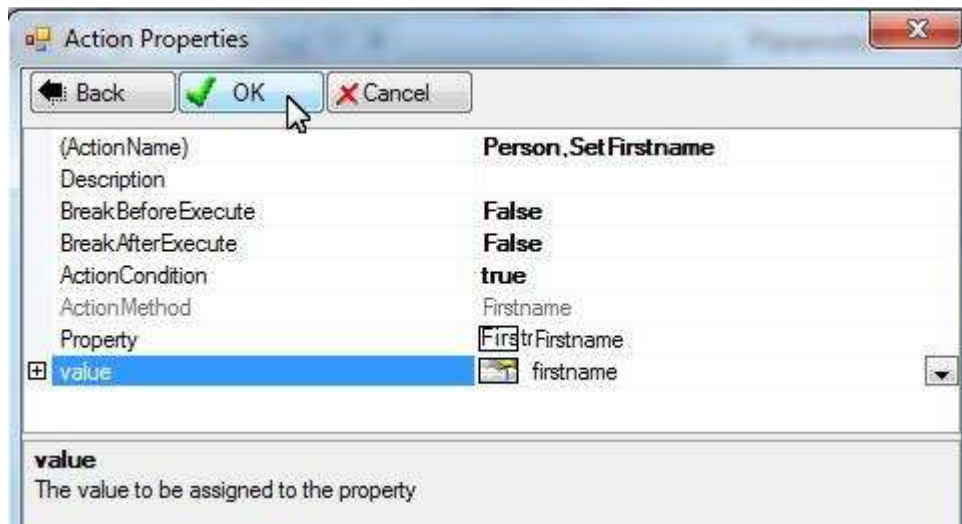


Choose the parameter firstname:

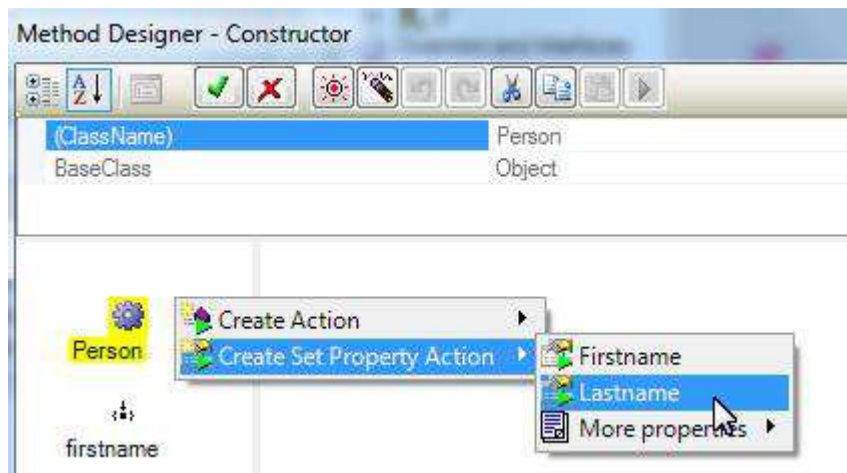




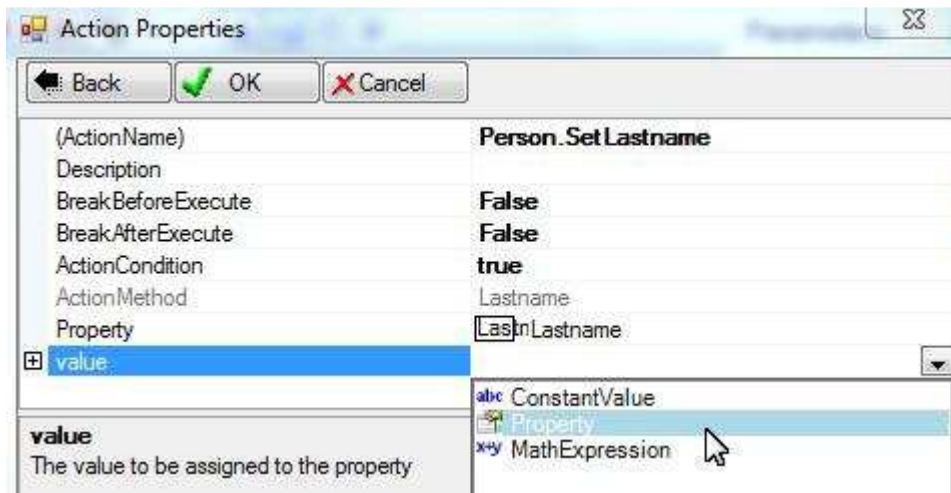
Click OK to finish creating this action:



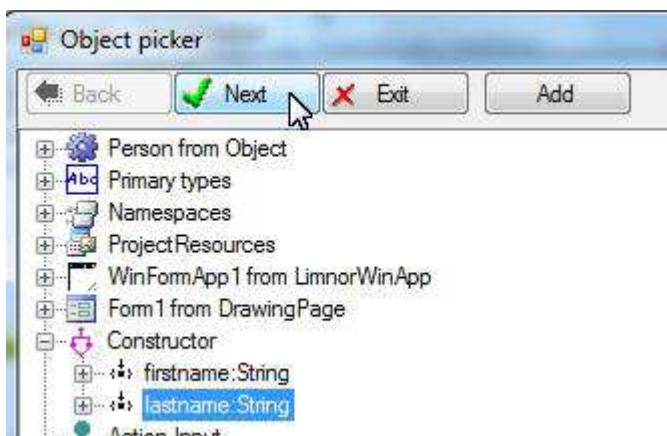
Create another action. Right-click Person; choose "Create Set Property Action"; choose Lastname:



For "value", choose "Property":



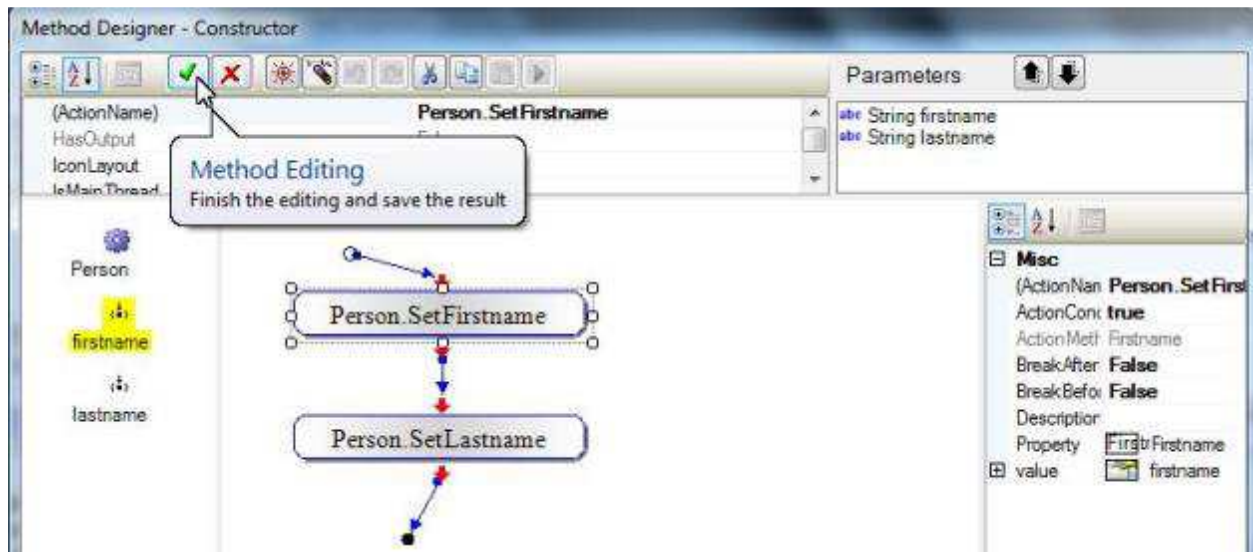
Select parameter lastname:



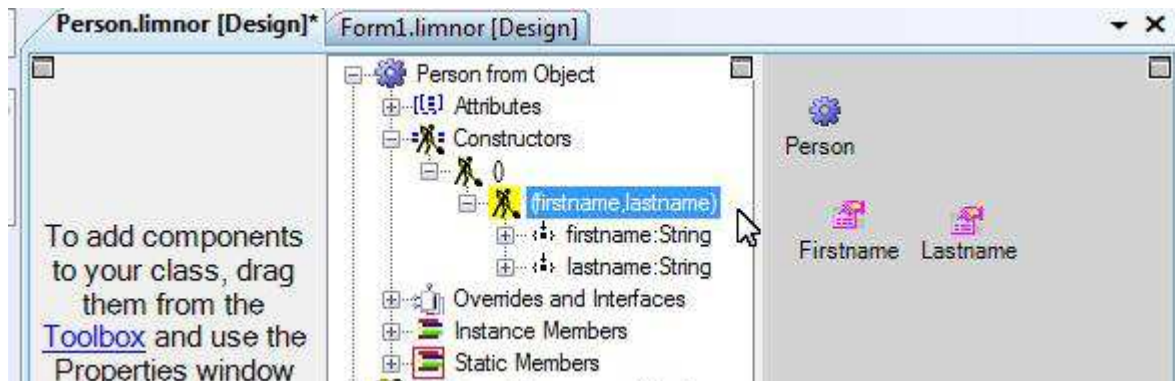
Click OK to finish creating this action:



Link the two actions together. This is our new constructor:



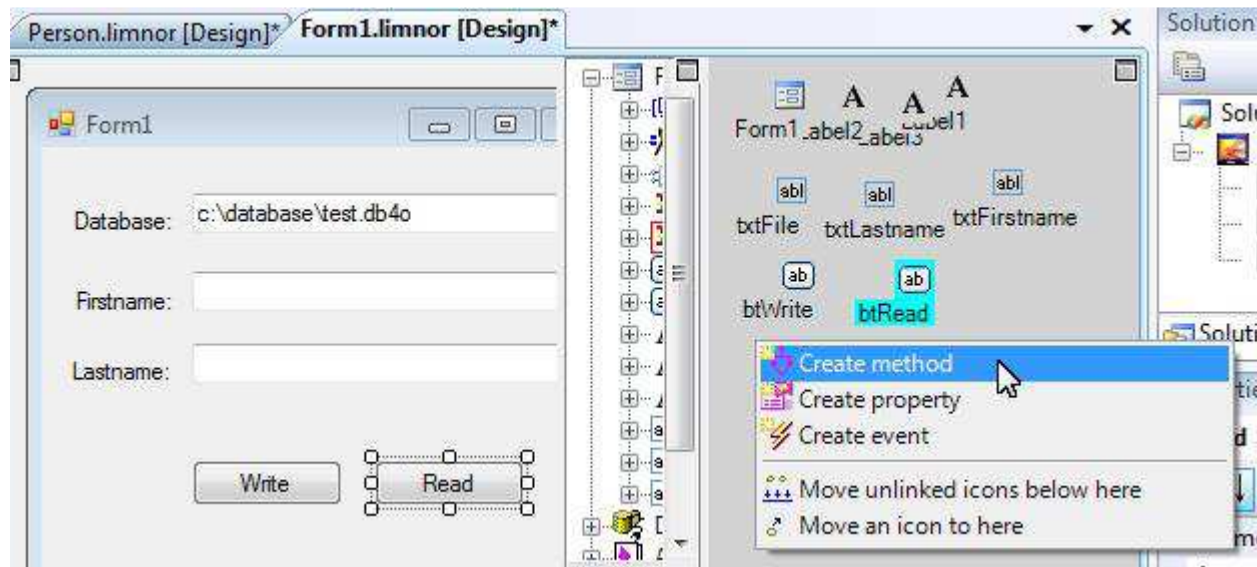
The new constructor appears under its base constructor:



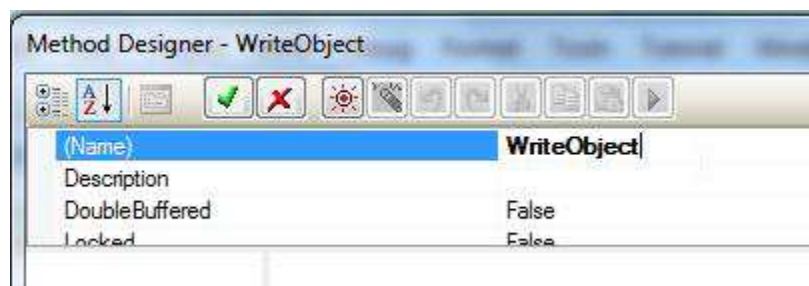
## Write Object to Database

We create a method to write a Person object to the database.





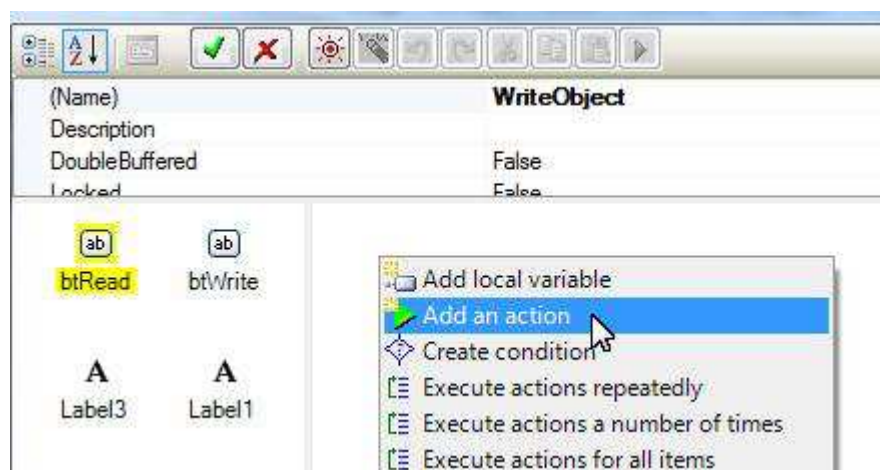
Rename the method to WriteObject:



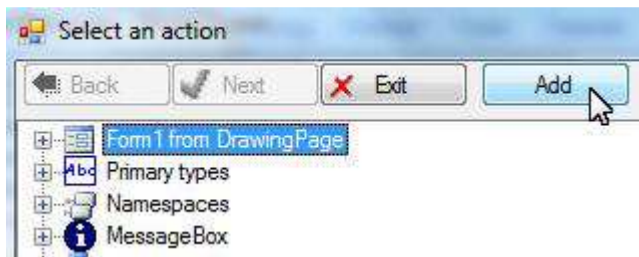
## Open database

According to the db4o documentation, we need to use db4oFactory class to open a database, using OpenFile method.

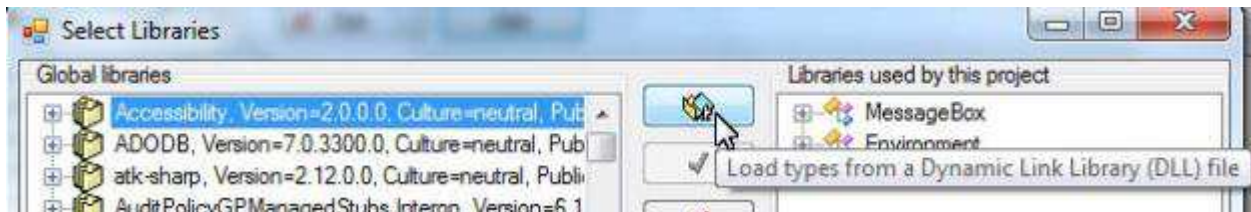
Right-click the Action Pane; choose “Add an action” to create an OpenFile action:



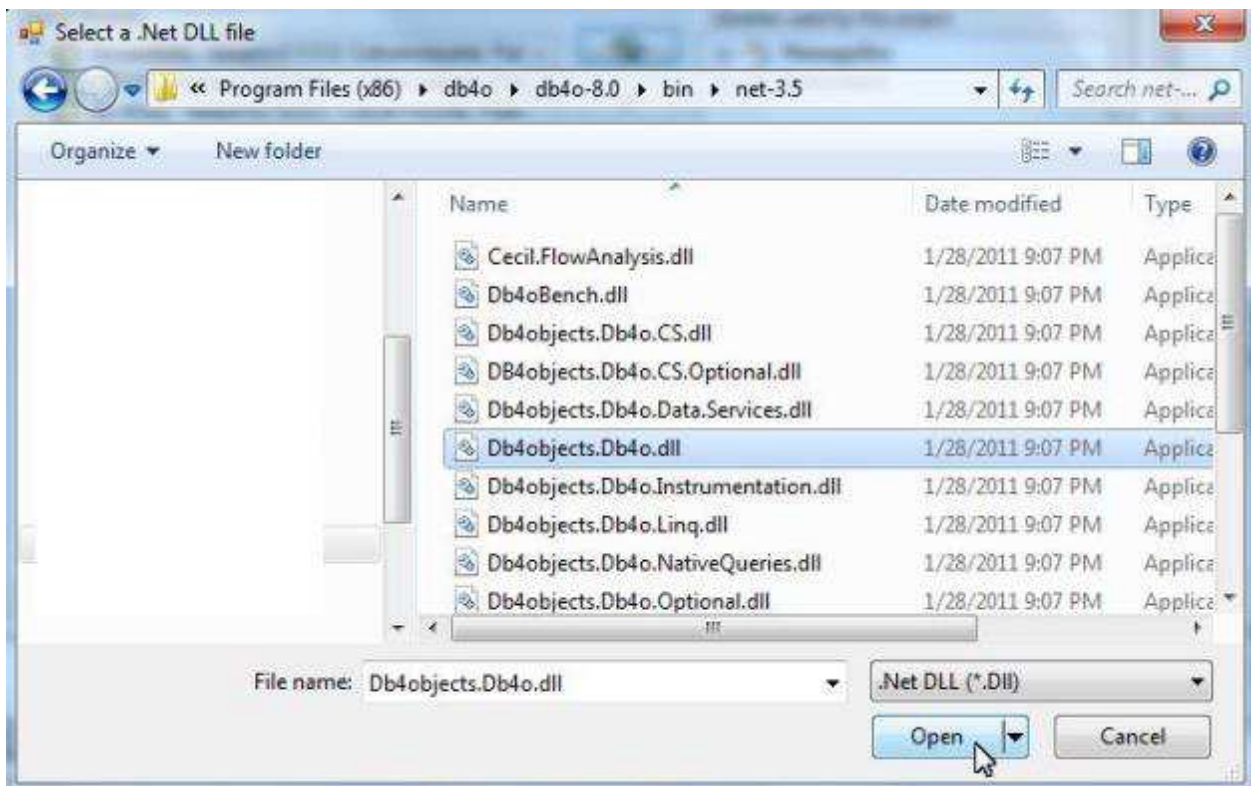
Because db4o is a 3<sup>rd</sup> party library, we need to add it to our project. Click Add button:



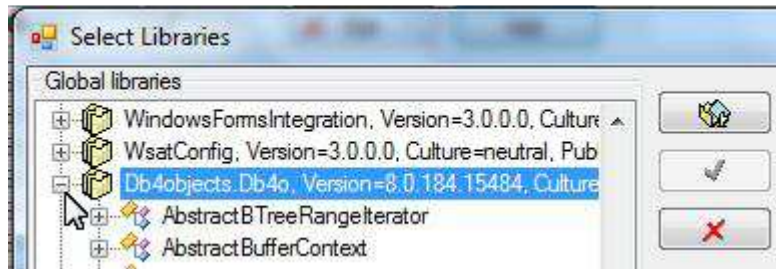
Click the load button to load the library:



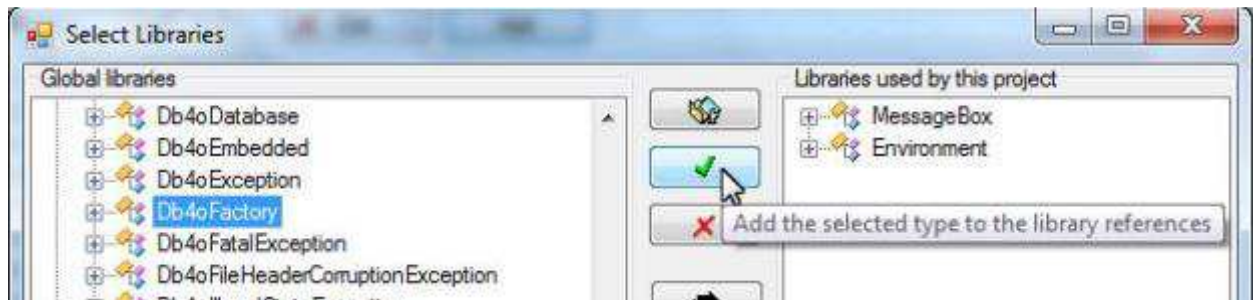
Select Db4Objects.db4o.Dll, click Open:



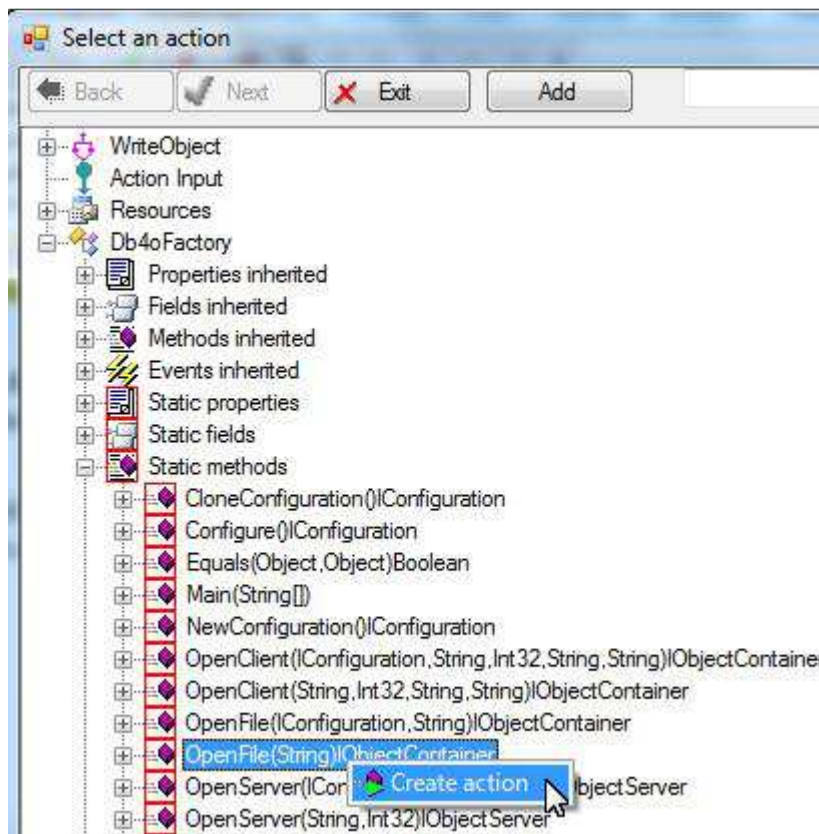
Expand Db4objects.Db4o:



Select the Db4oFactory and click the button:

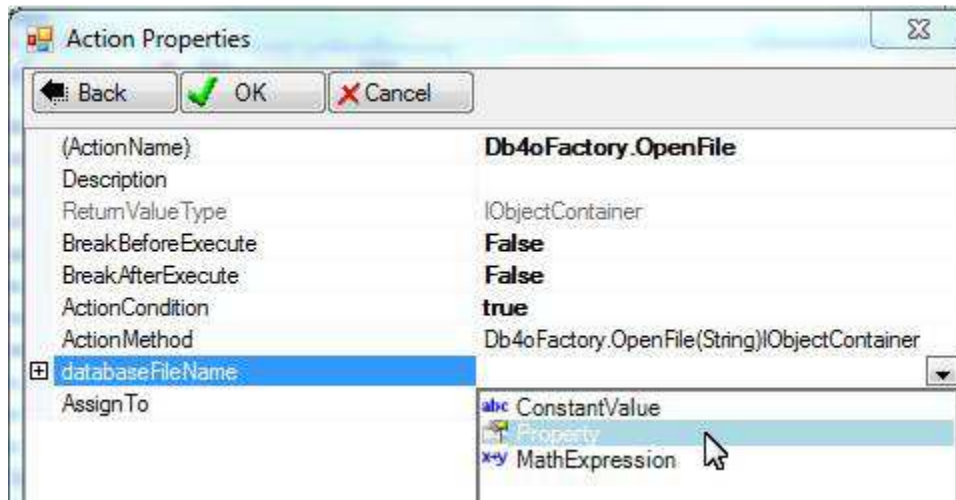


Right-click the OpenFile method; choose "Create action":

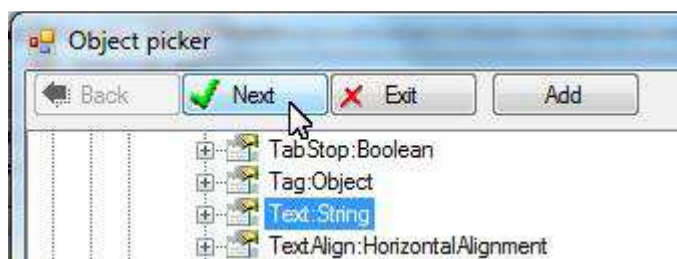
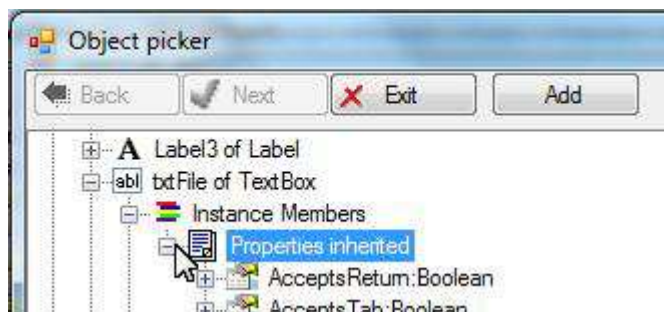
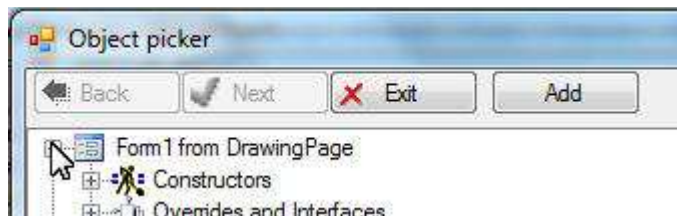


For "databaseFileName", choose "Property":

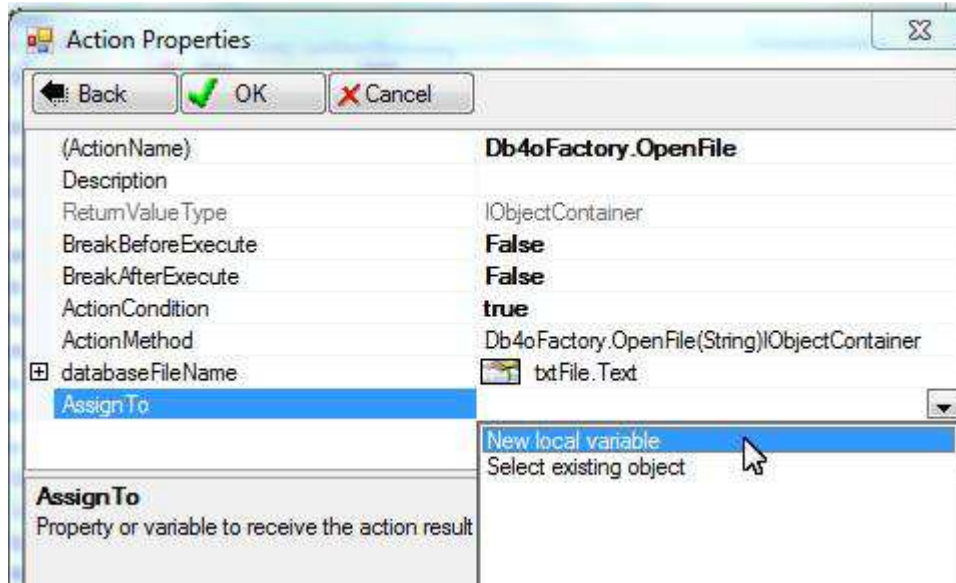




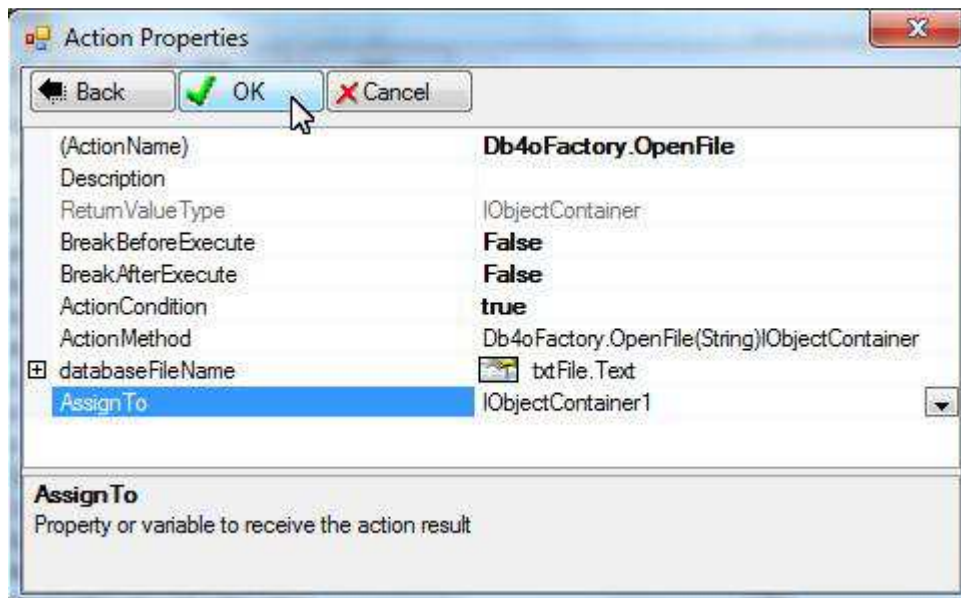
Select the Text property of the database text box:



For "AssignTo", choose "New local variable":

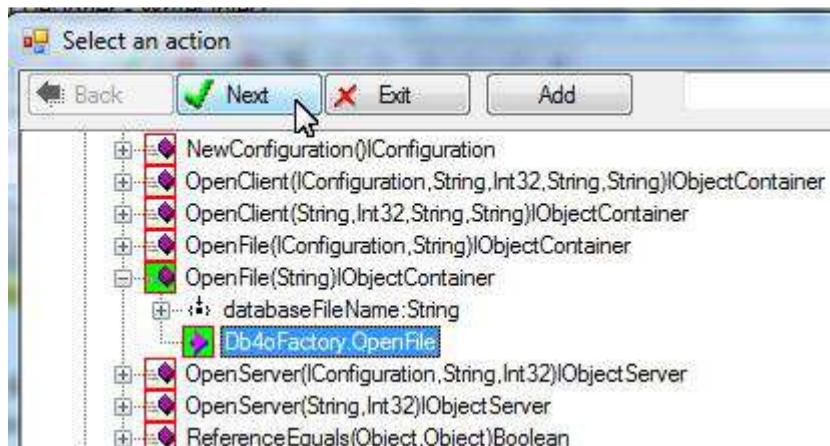


Click OK to finish creating this action:

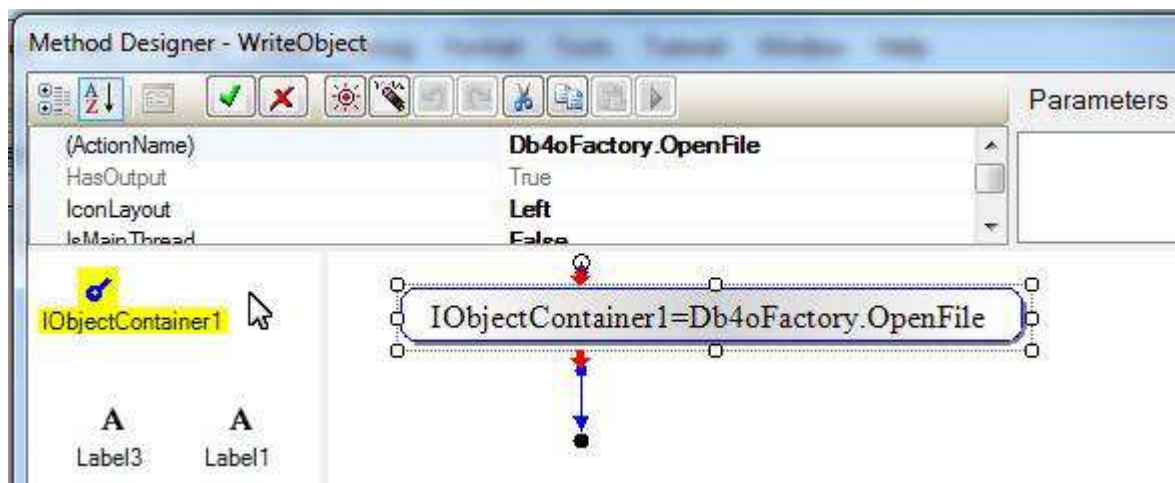


With the new action selected, click "Next":





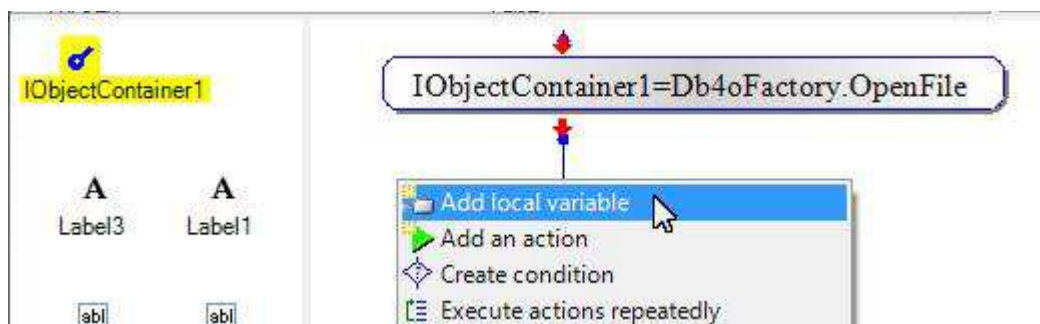
The new action appears in the Action Pane. A new variable, `IObjectContainer1`, appears in the variable Pane:



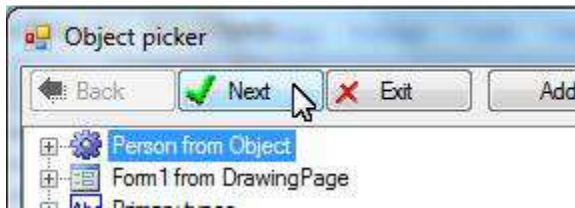
### Create a sample object

We create a `Person` object to demonstrate saving object to database.

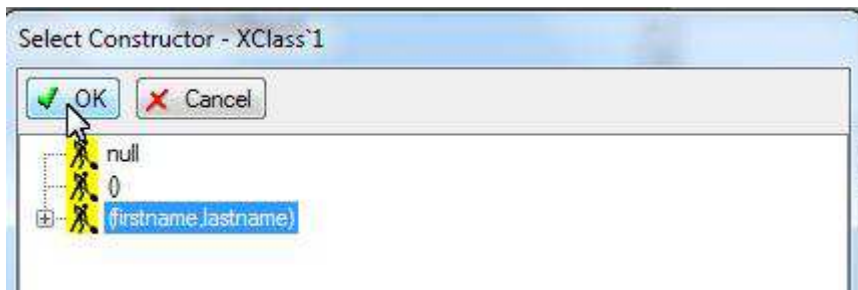
Right-click the Action-Pane; choose "Add local variable"



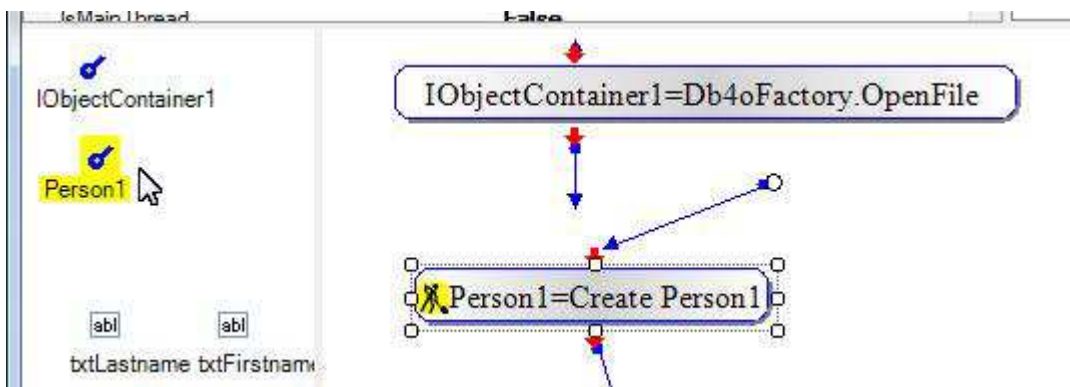
Select `Person`; click "Next":



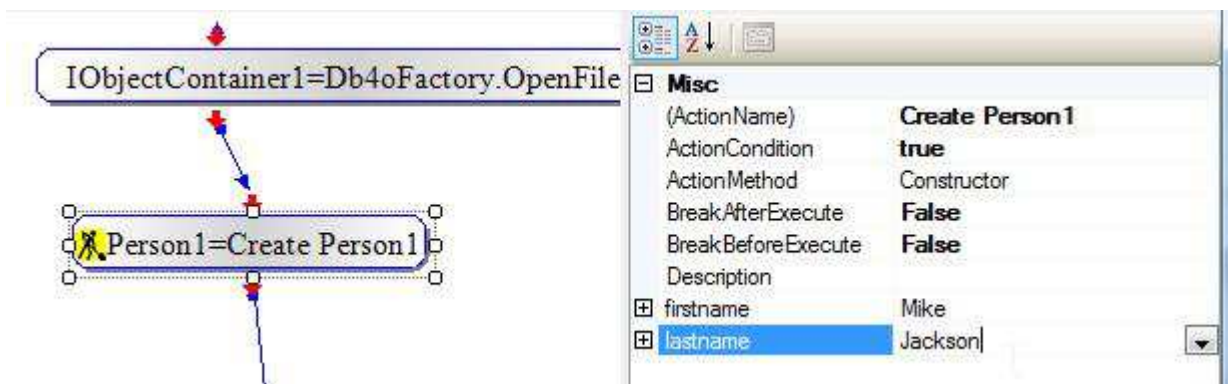
Select the constructor with parameters:



A new Person object, Person1, appears in the Variable Pane. The action creating the Person object appears in the Action-Pane.



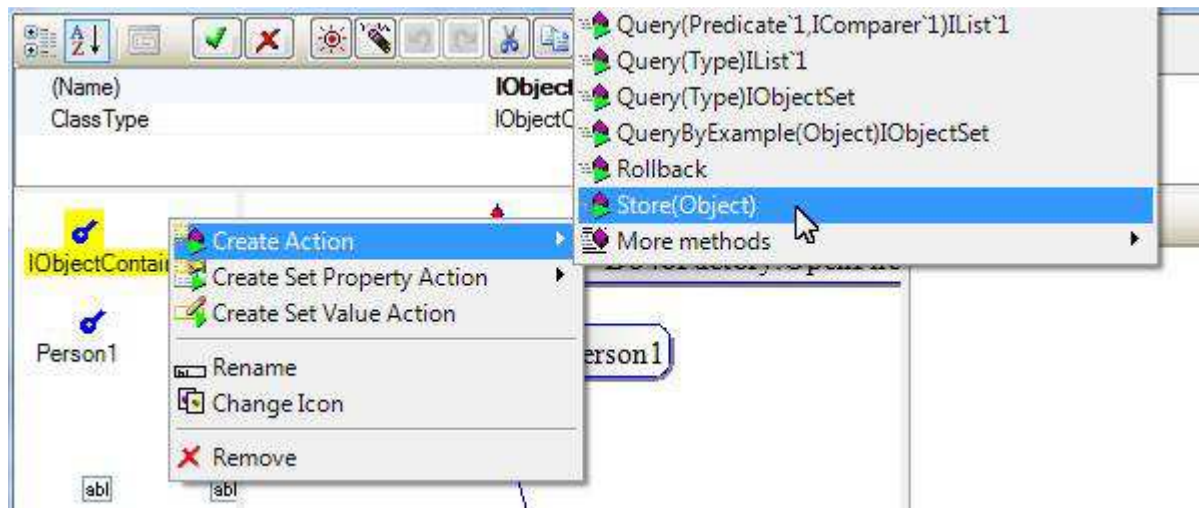
Link the action to the previous action. We may set the parameters for the action:



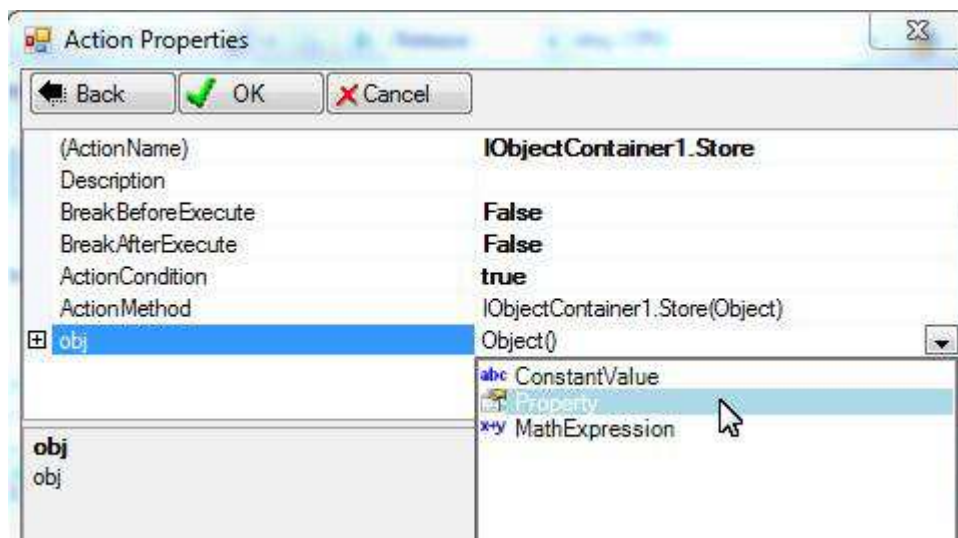
## Save object to database

To save this Person object to the database, we may use a Store action.

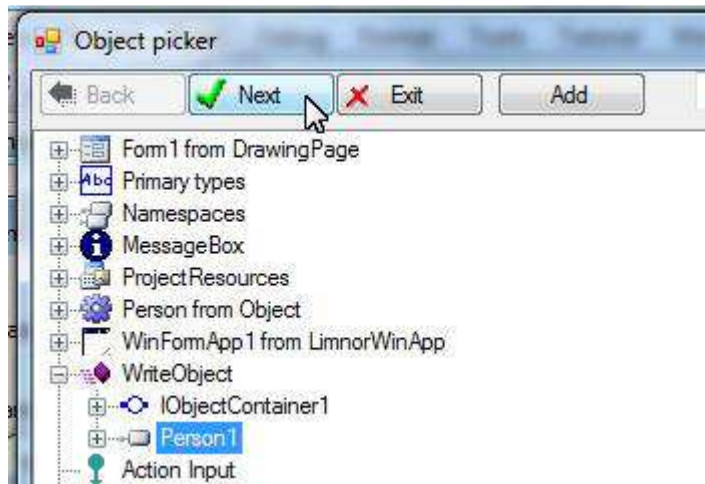
Right-click the variable `IObjectContainer1`; choose “Create action”; choose “Store” method:



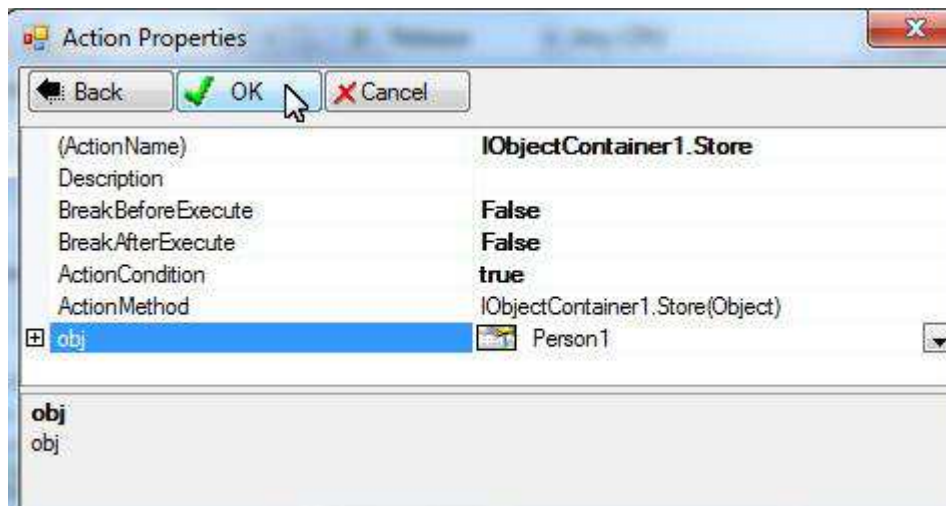
For “obj”, choose “Property”:



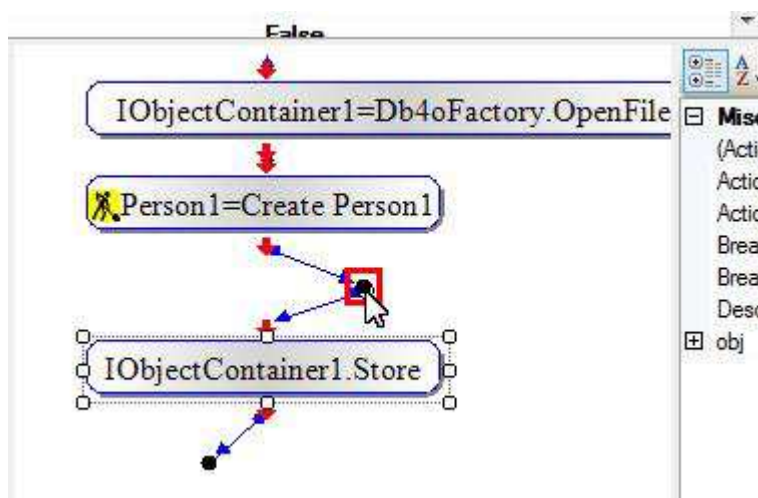
Choose “Person1”; click “Next”:



Click OK to finish creating this action:



The action appears in the Action Pane. Link it to the last action:

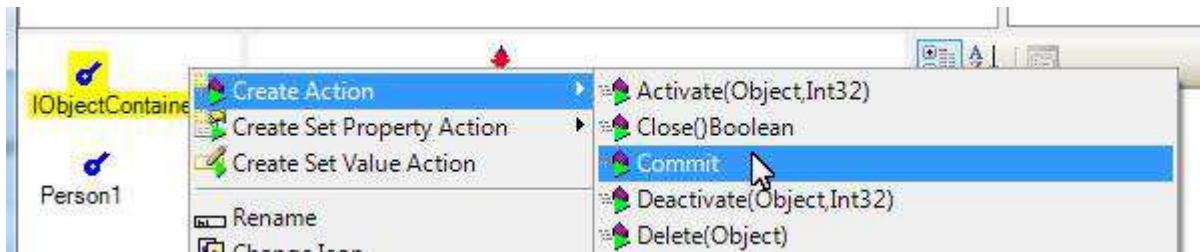




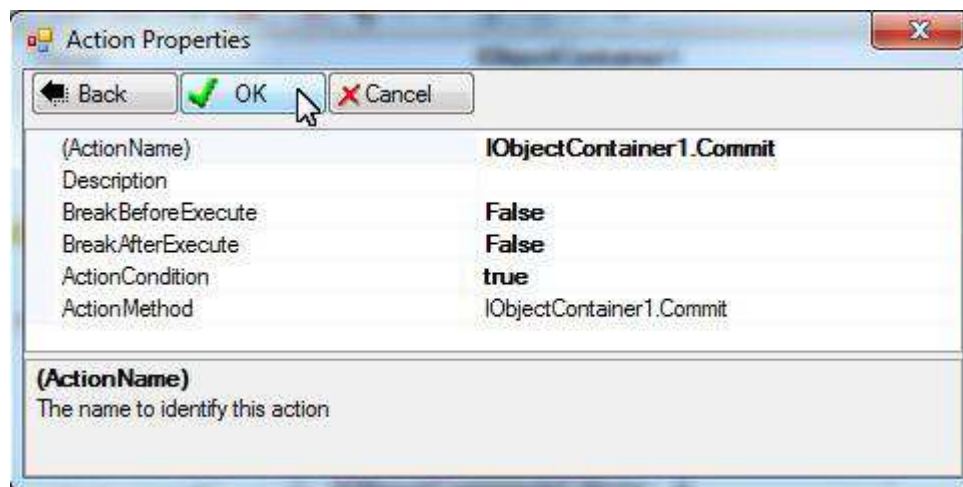
## Commit and close database

According to the db4o documentation, we need to add a Commit action and a Close action to finish saving the object to the database.

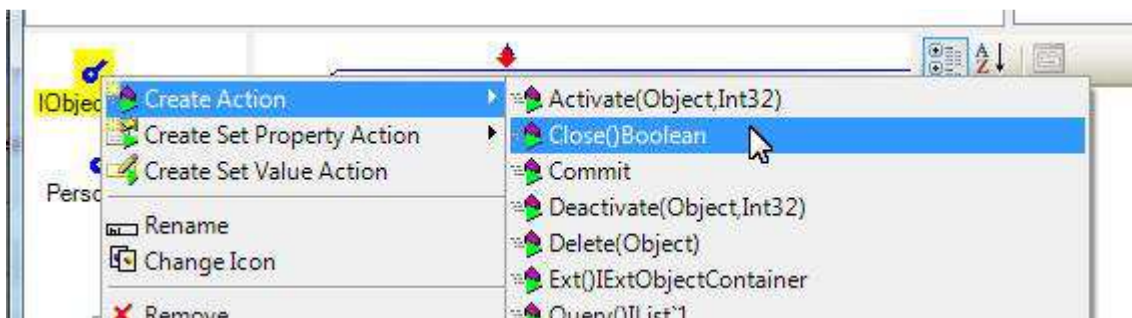
Right-click variable `IObjectContainer`; choose "Create Action"; choose "Commit":



Click OK to finish creating this action:

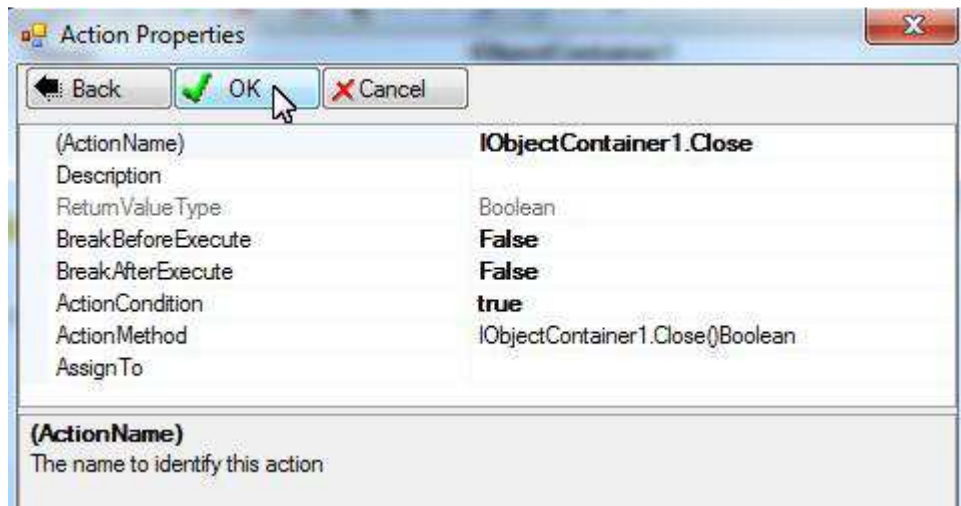


Right-click variable `IObjectContainer`; choose "Create Action"; choose "Close":

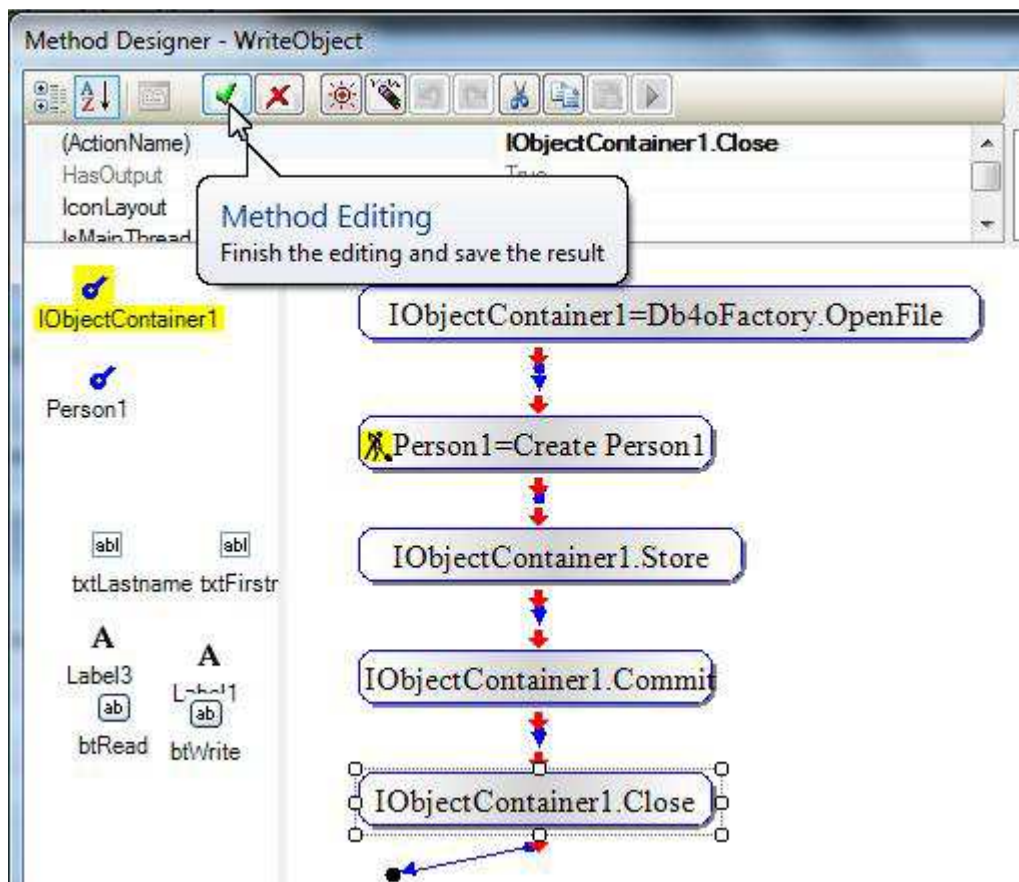


Click OK to finish creating this action:



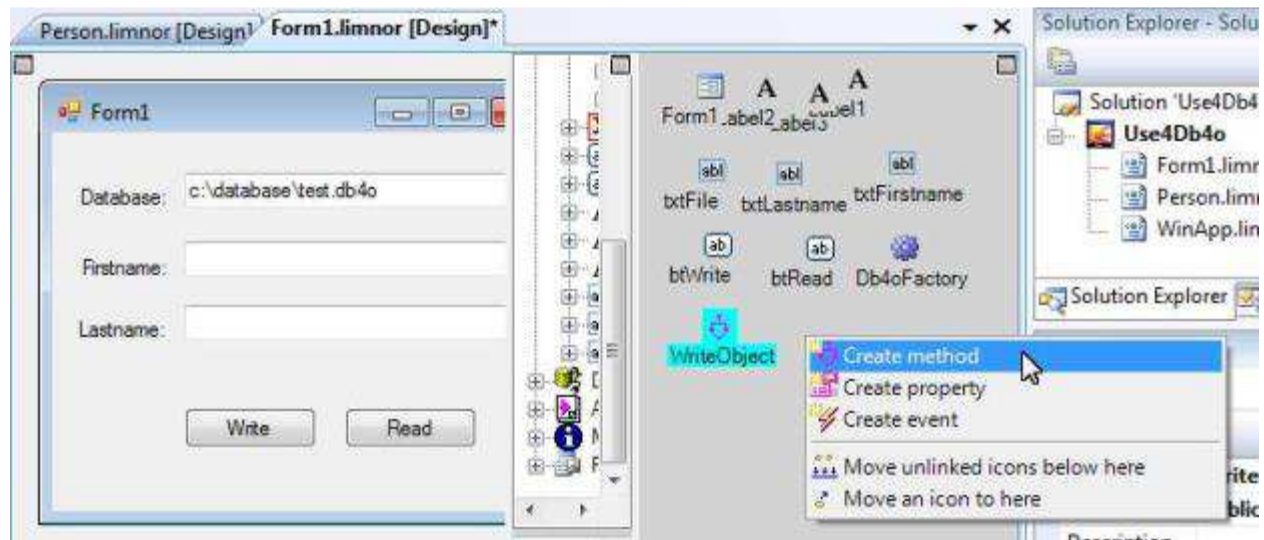


Link the actions together. We are done creating this method:



## Read Object from Database

Create another method to read object from the database.

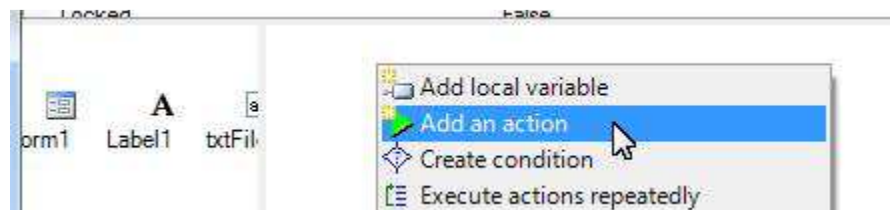


Rename it to ReadObject:

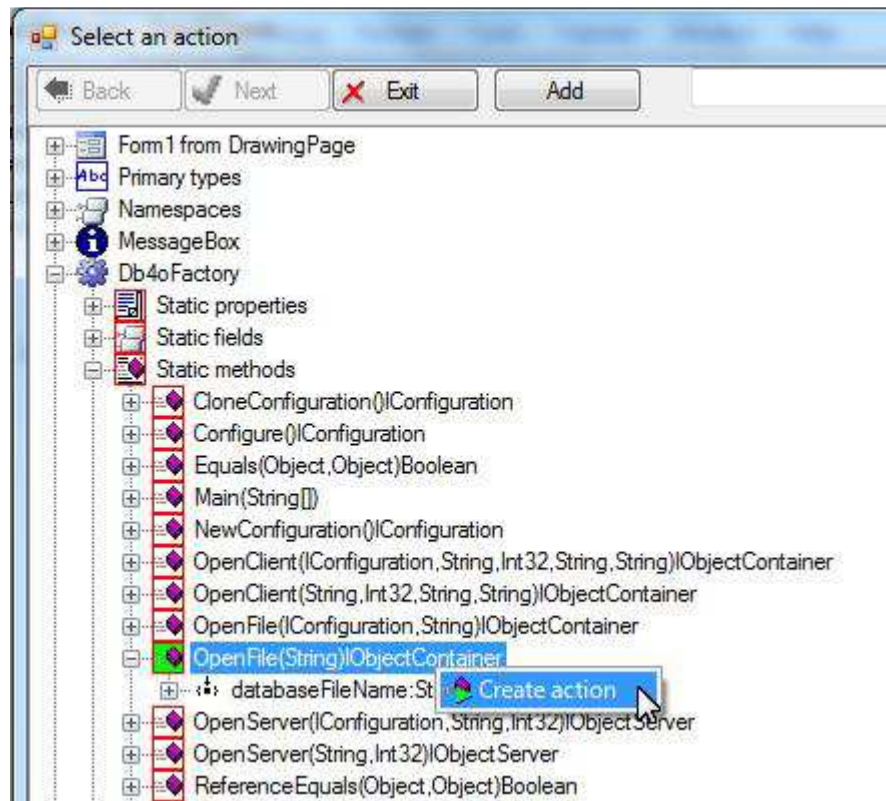


## Open Database

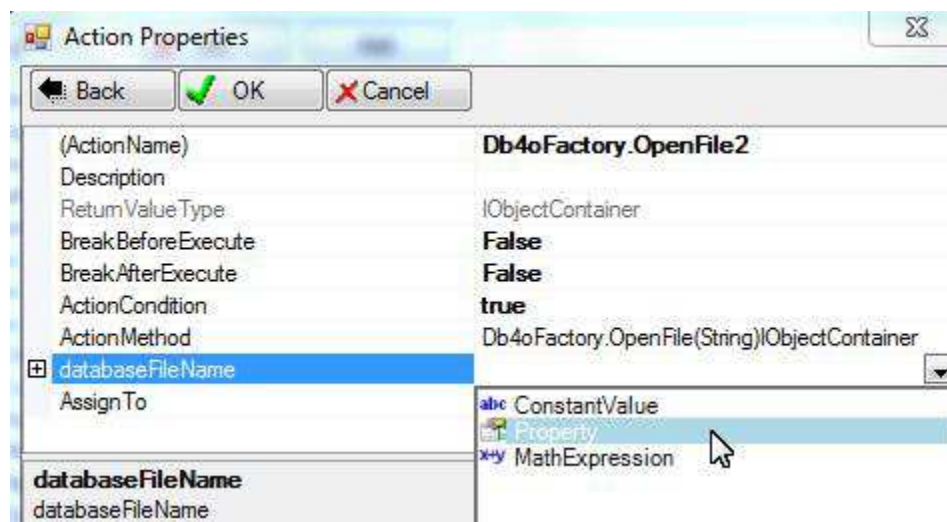
Right-click the Action Pane; choose "Add an action":



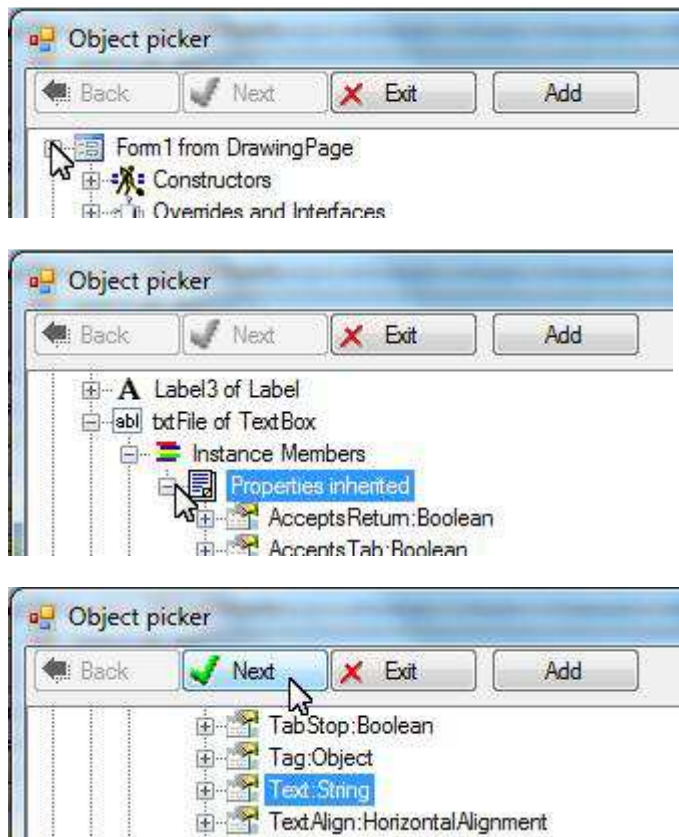
Right-click "OpenFile" method; choose "Create action":



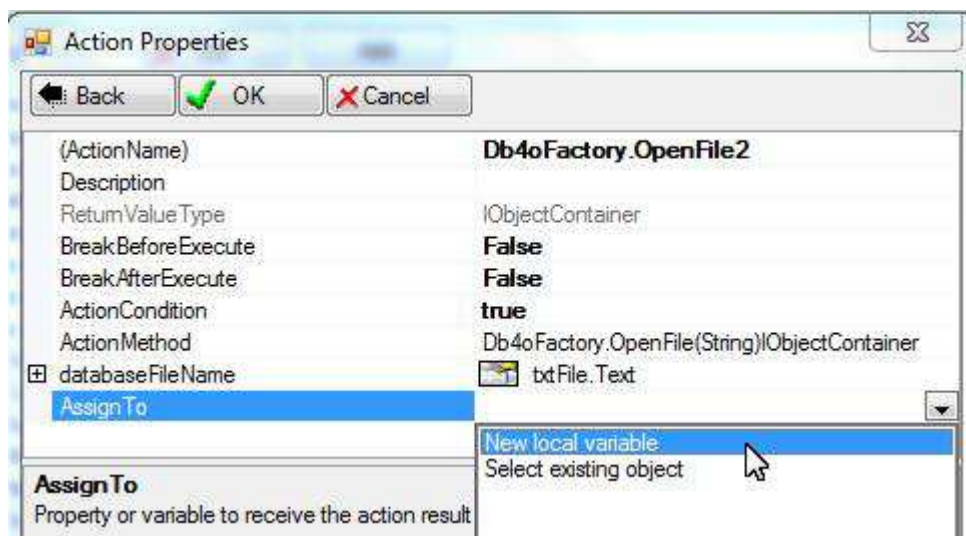
For “databaseFileName”, choose “Property”:



Select the Text property of the database text box:

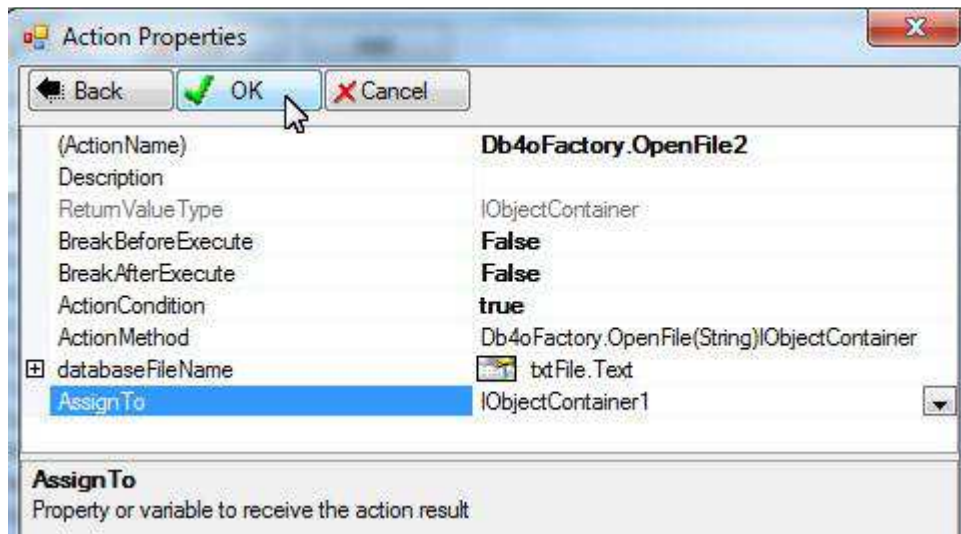


For "AssignTo", choose "New local variable":

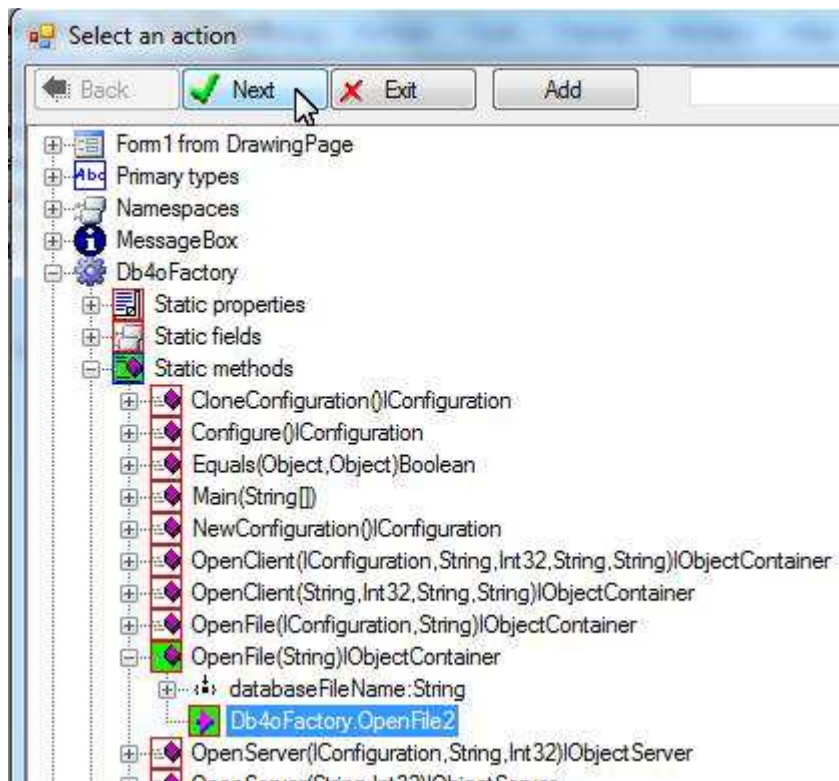


Click OK to finish creating this action:



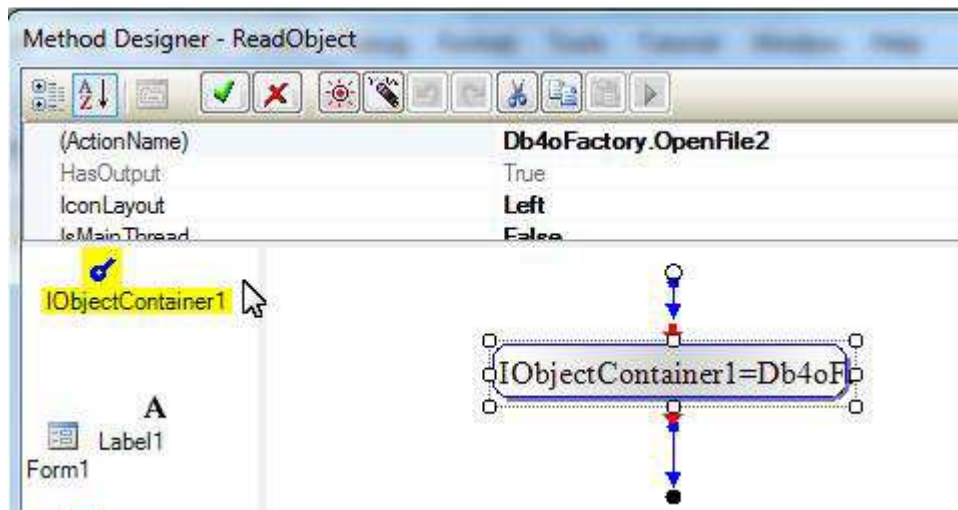


With the new action selected, click “Next”:



The new action appears in the Action Pane. A new variable, IOjectContainer1, appears in the variable Pane:

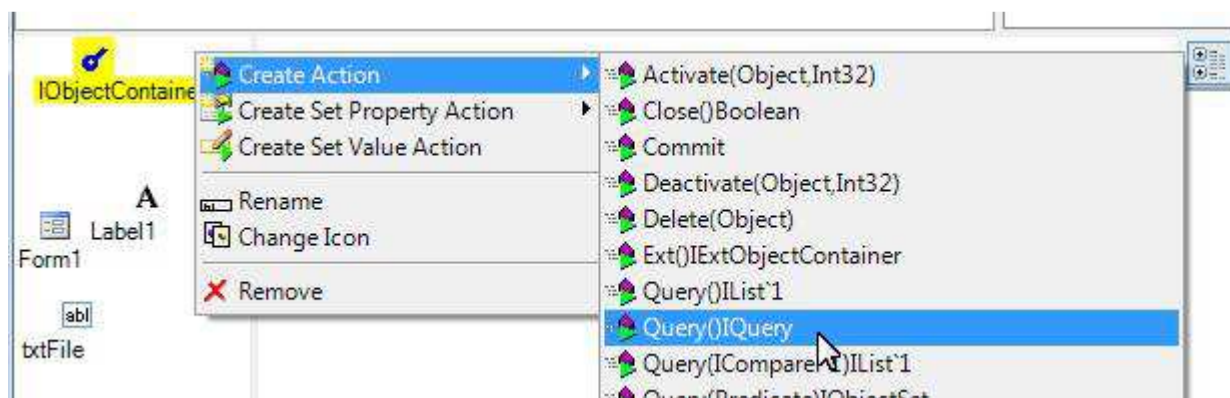




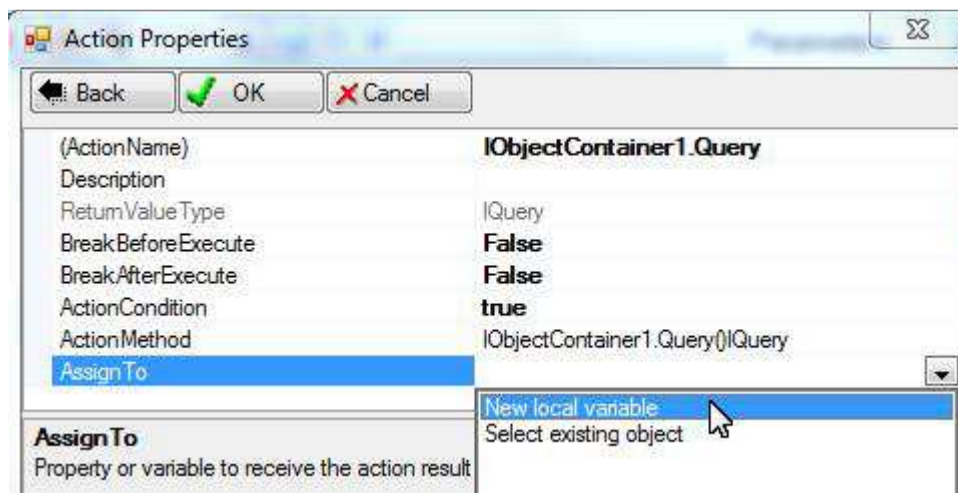
## Create Query

According to the db4o document, we need to create IQuery to read from the database.

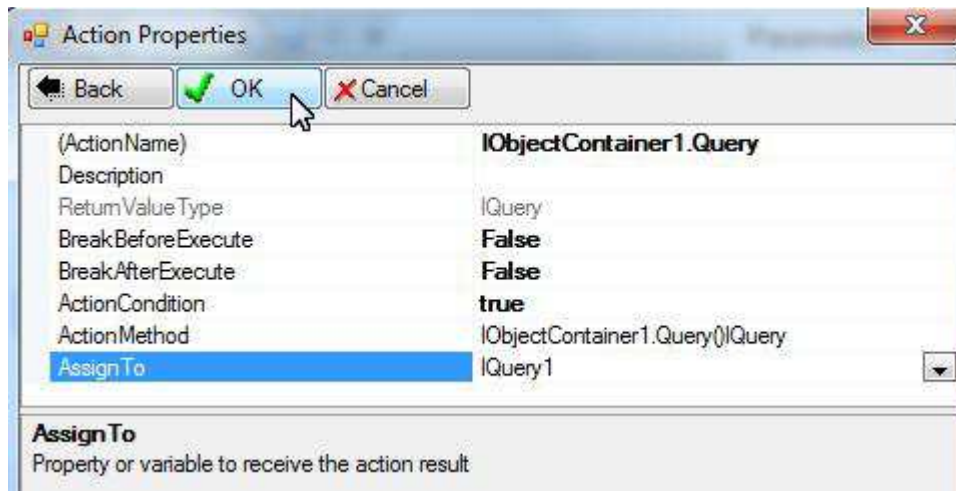
Right-click variable IObjectContainer; choose “Create Action”; choose “Query”:



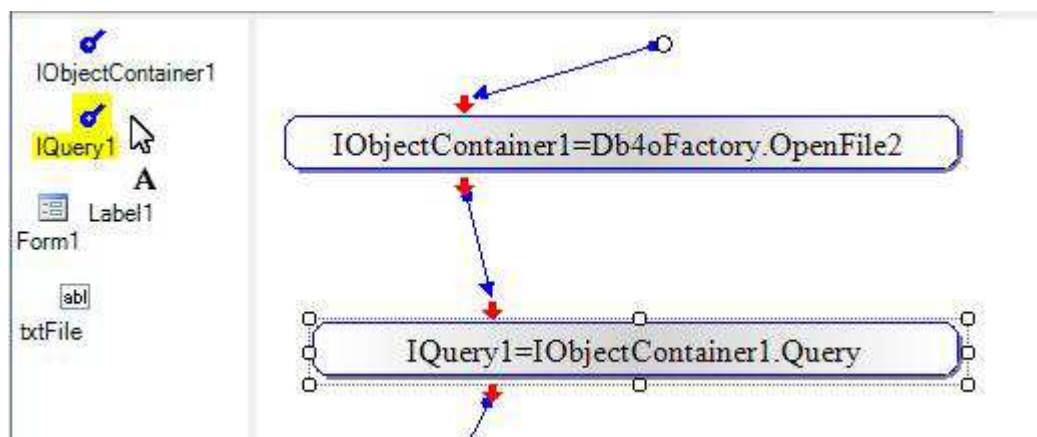
For “AssignTo”, choose “New local variable”:



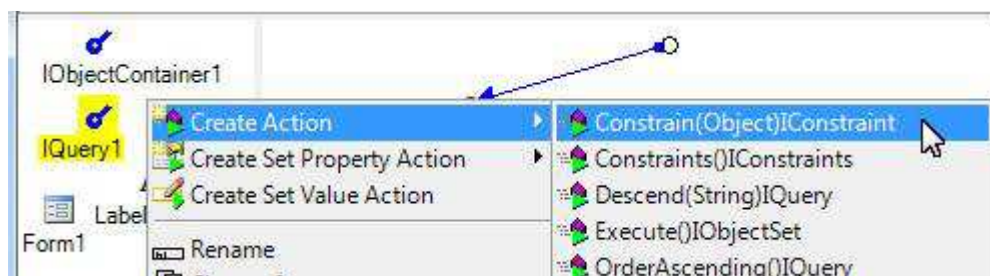
Click OK to finish creating this action:



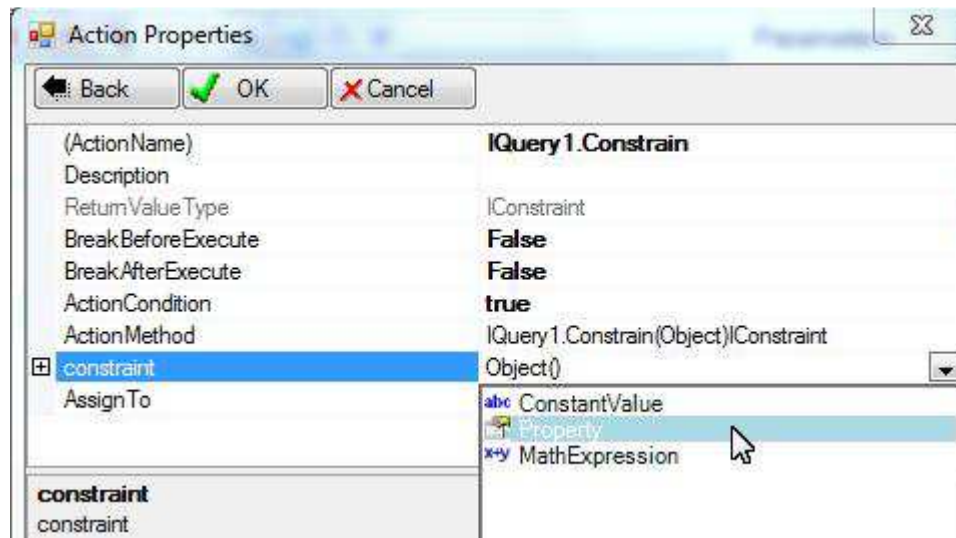
The new action appears in the Action Pane; a new variable, IQuery1, appears in the Variable Pane:



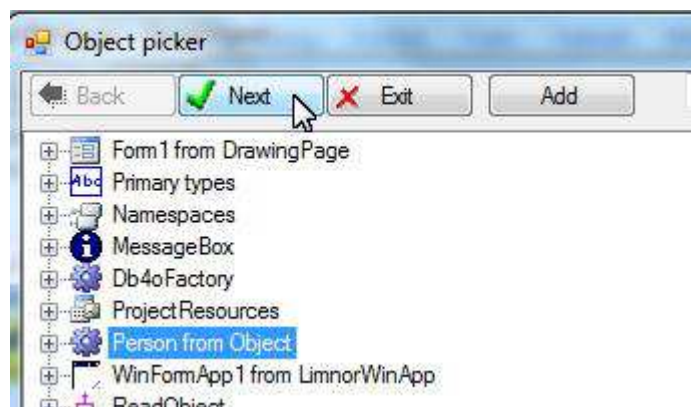
Right-click IQuery1; choose "Create Action"; choose "Constrain":



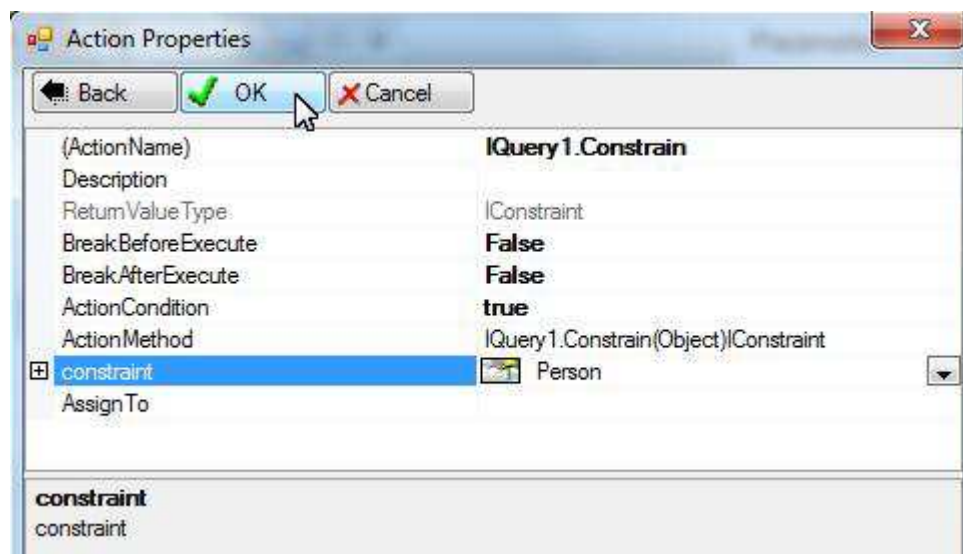
For "constraint", choose "Property":



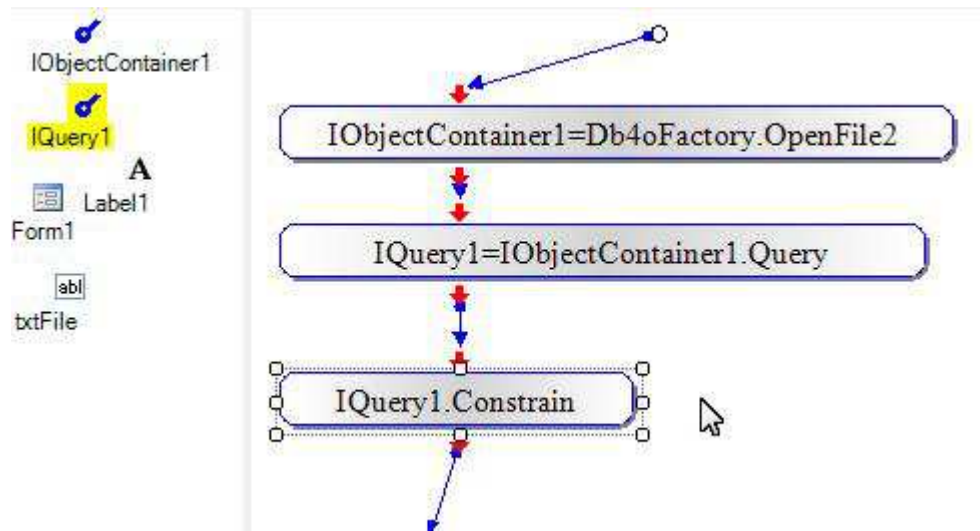
Select Person, click “Next”:



Click OK to finish creating this action:

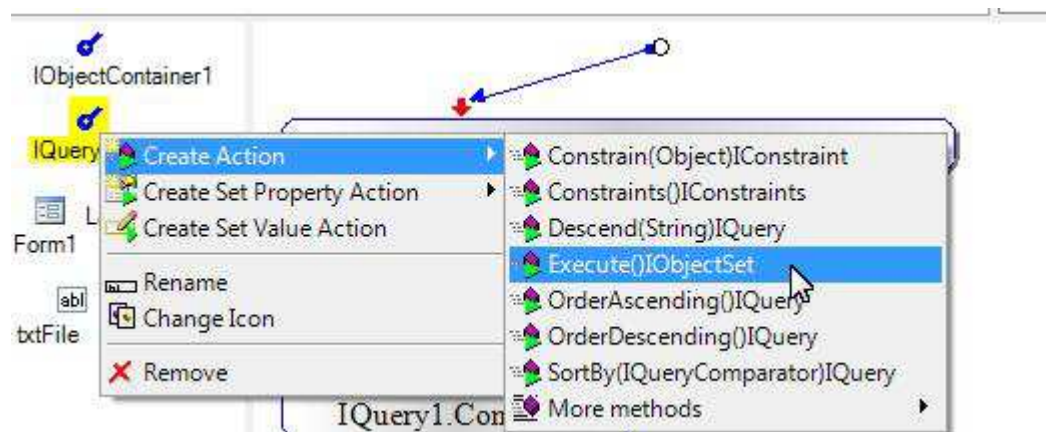


Link the actions together:

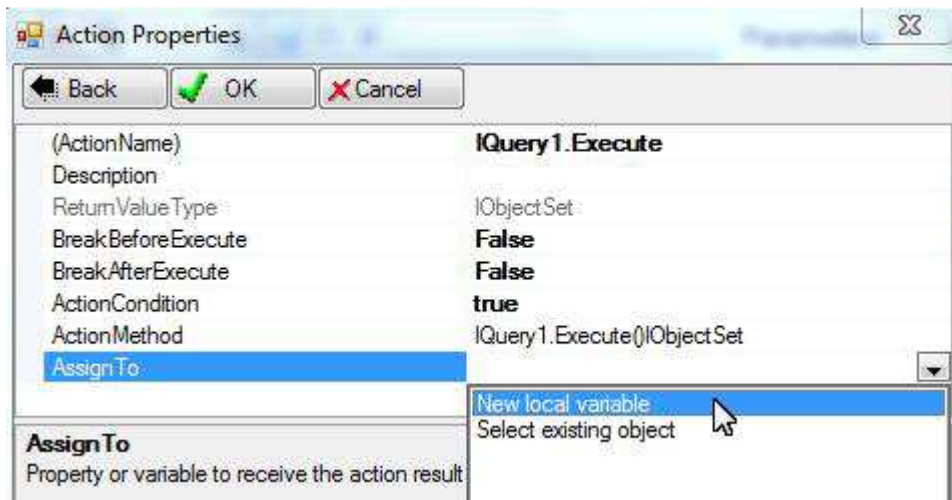


### Execute query

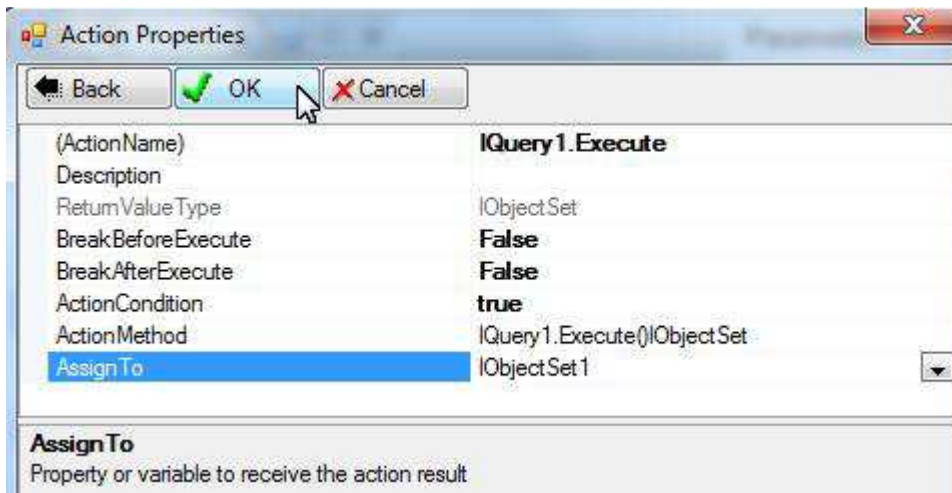
Right-click IQuery1; choose “Create Action”; choose “Execute”:



For “AssignTo”, choose “New local variable”:

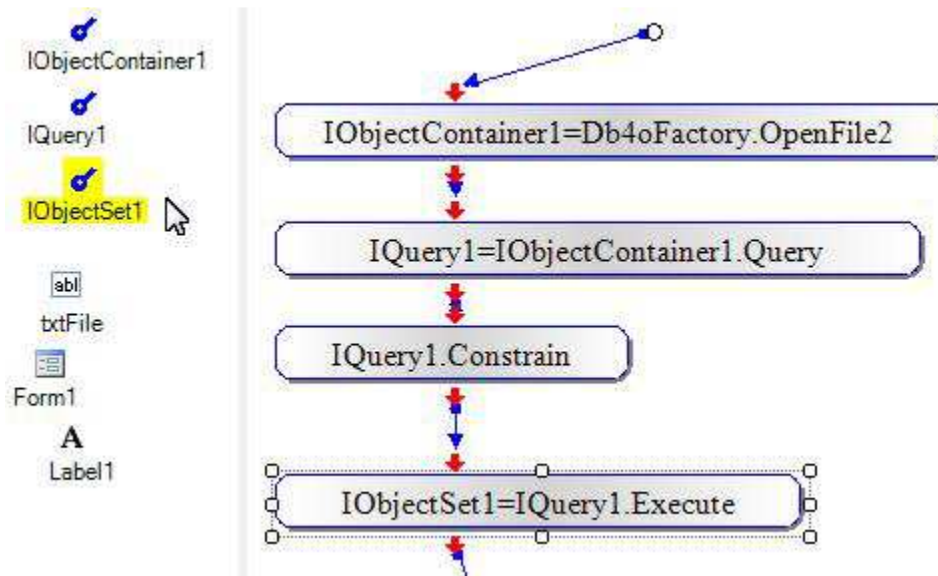


Click OK to finish creating this action:



The new action appears in the Action Pane. A new variable, IObjectSet1, appears in the Variable Pane:



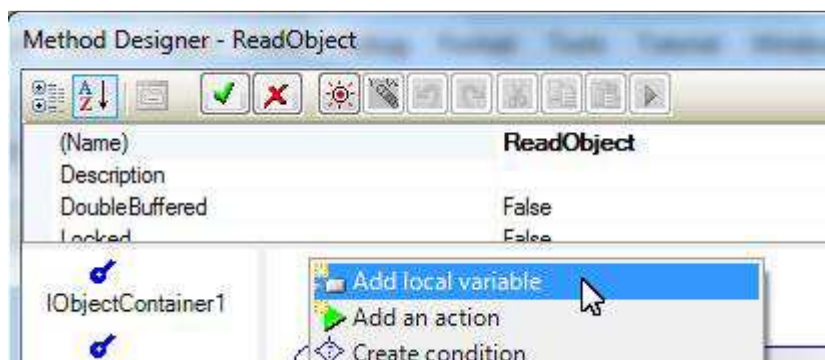


## Read Object

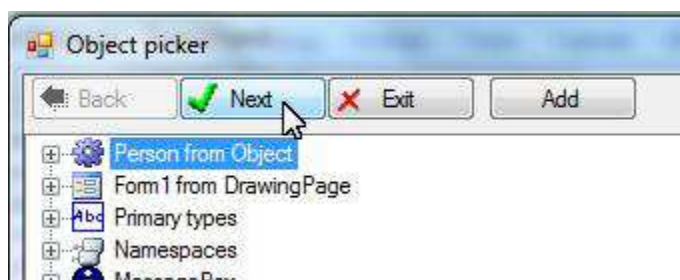
IObjectSet has a Next method for reading an object. We may repeatedly call Next to read all objects.

For this simple sample, we just call Next once to get one object.

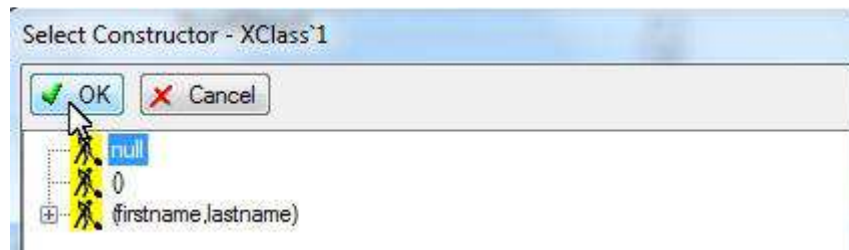
To read a Person object, we first create a Person variable. Right-click the Action Pane; choose “Add local variable”:



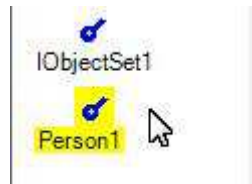
Select Person; click “Next”:



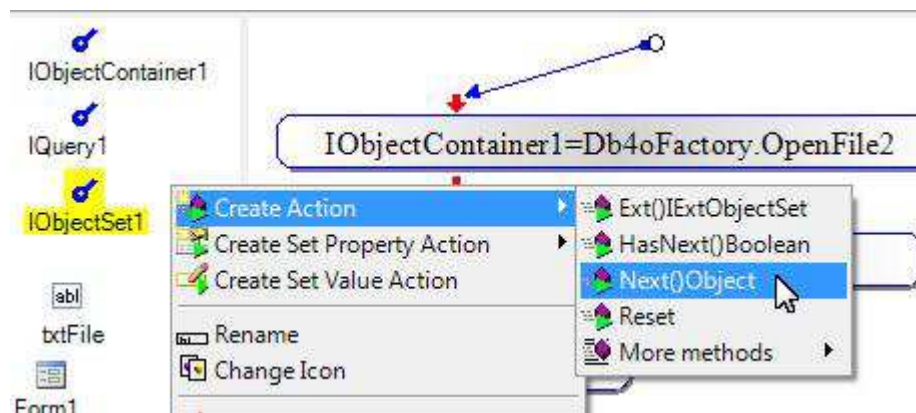
Select “null” because the object will be read from the database; click “OK”:



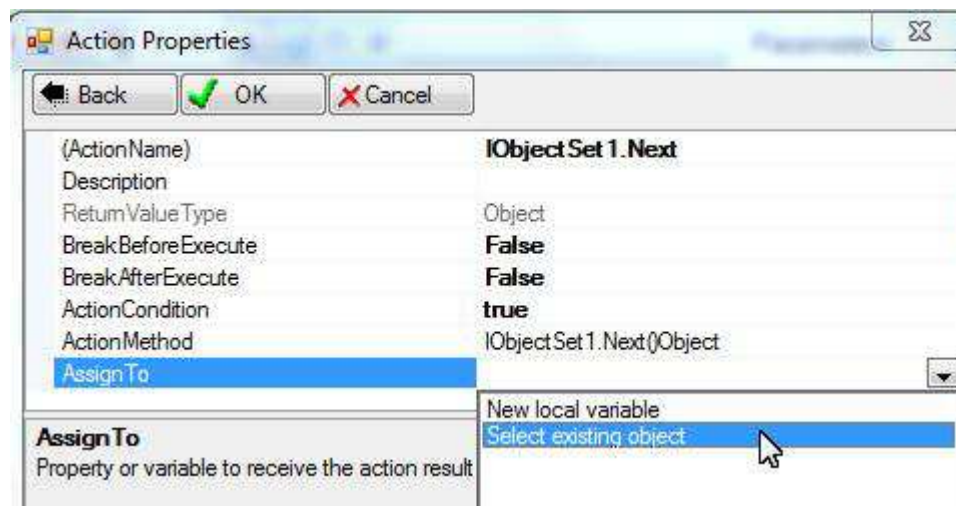
The new variable, Person1, appears in the Variable Pane:



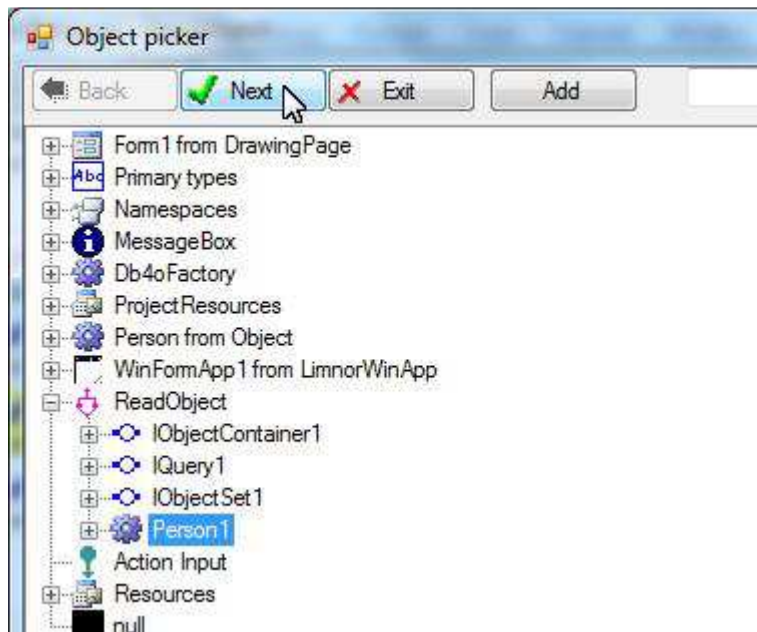
Right-click IObjectSet1; choose "Create Action"; choose "Next":



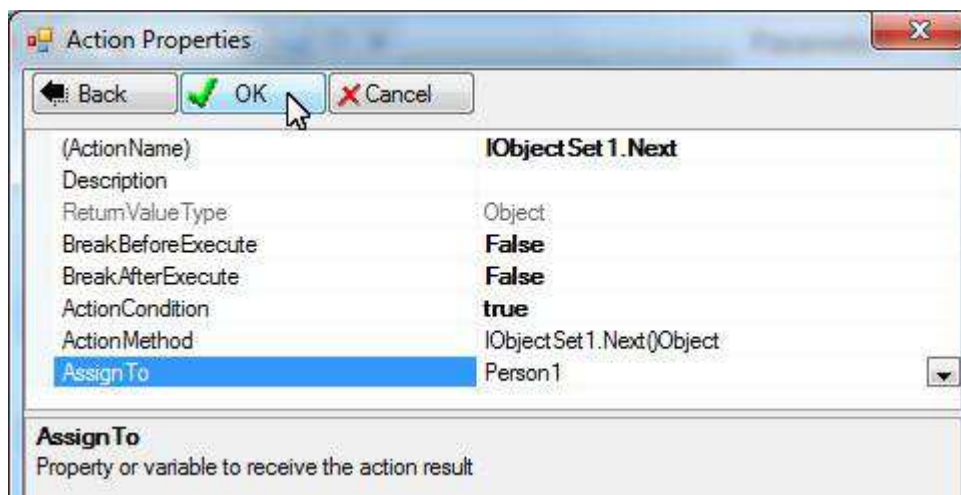
For "AssignTo", choose "Select existing object":



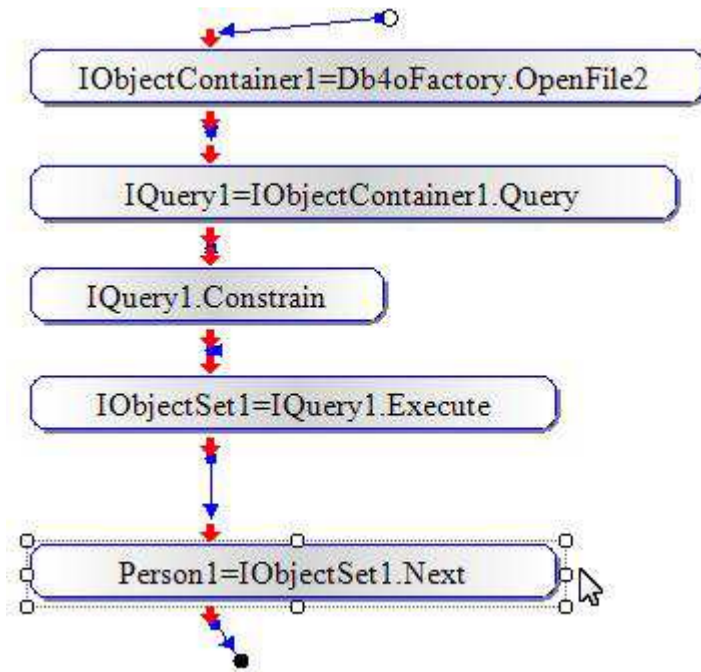
Select variable Person1; click "Next":



Click OK to finish creating this action:



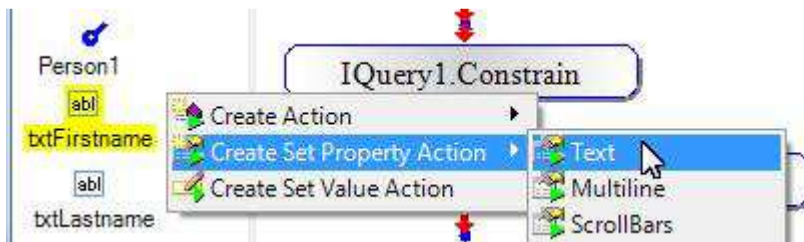
The new action appears in the Action Pane. Link it to the last action:



### Show the object

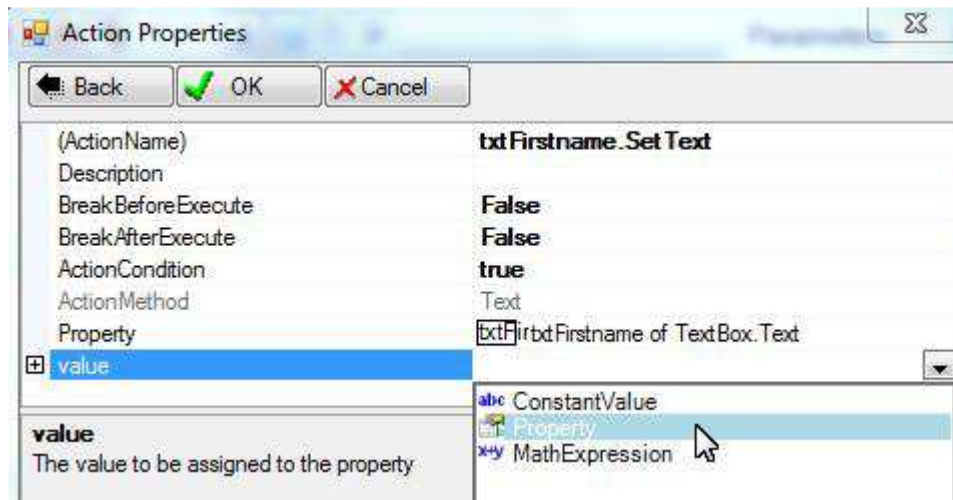
After reading the object, we may display it on the form.

Right-click the text box for the first name; choose “Create Set Property Action”; choose “Text”:

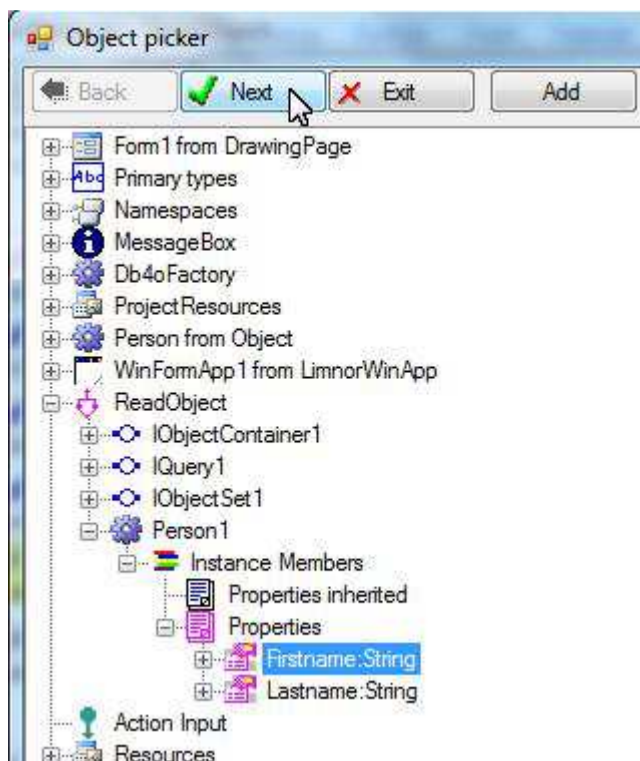


For the “value”, choose “Property”:

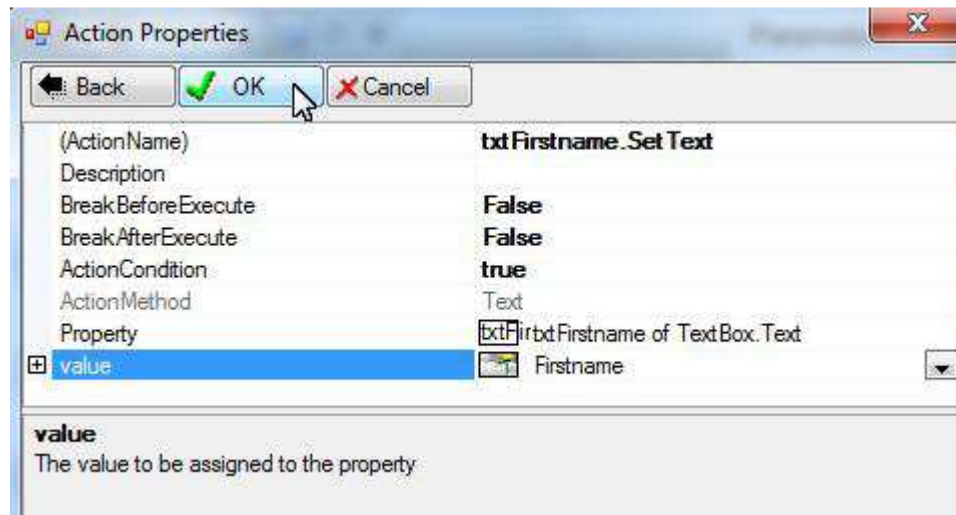




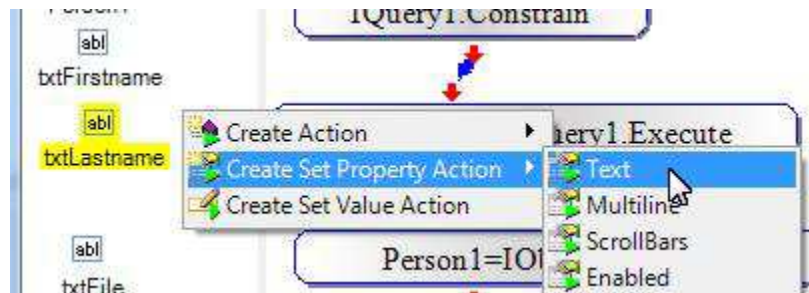
Select the Firstname of Person1; click “Next”:



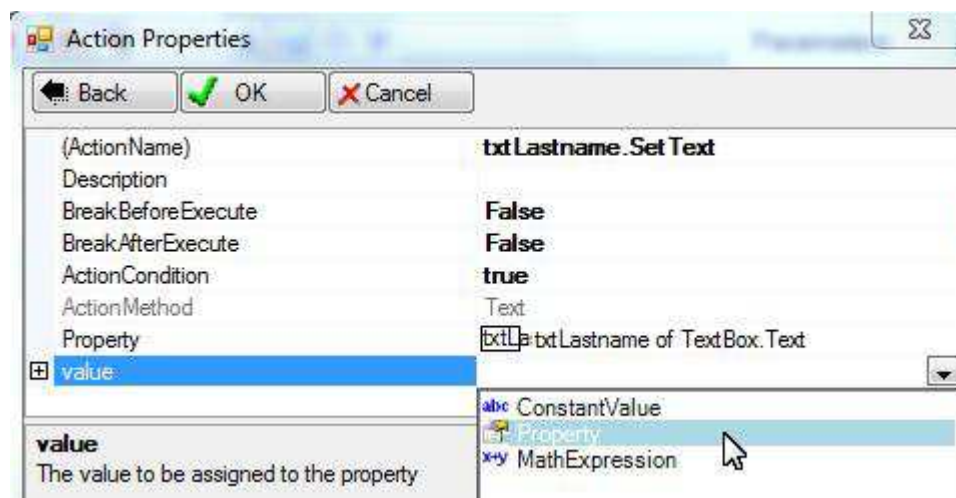
Click OK to finish creating this action:



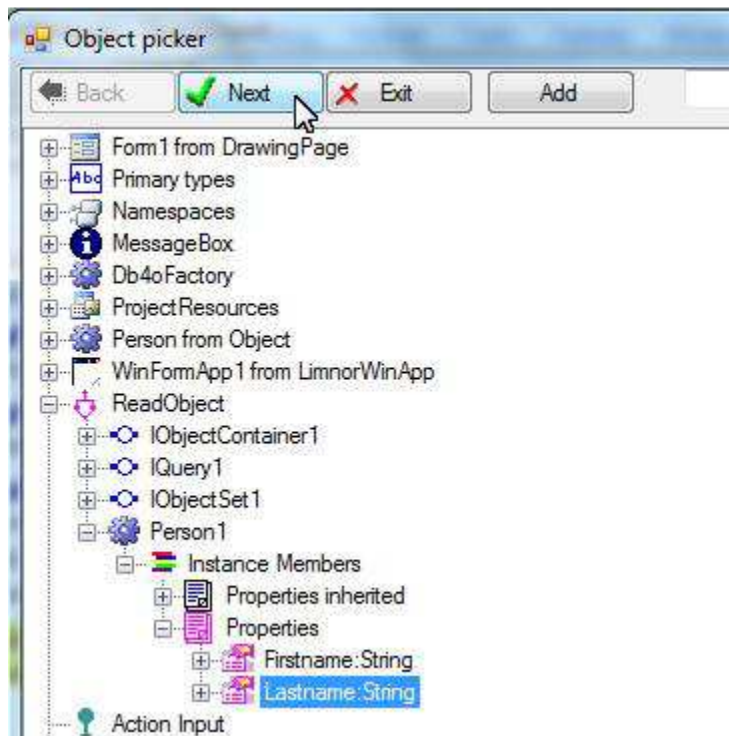
Right-click the text box for last name; choose “Create Set Property Action”; choose “Text”:



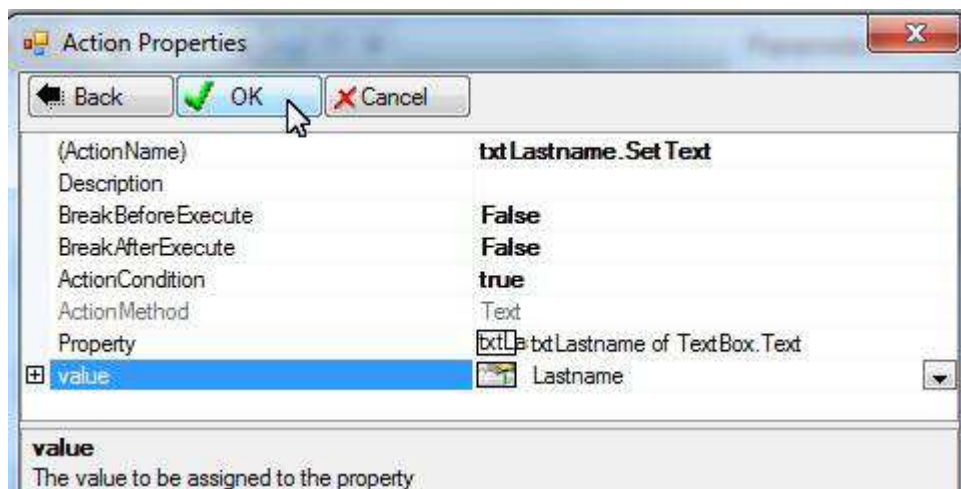
For “value”, choose “Property”:



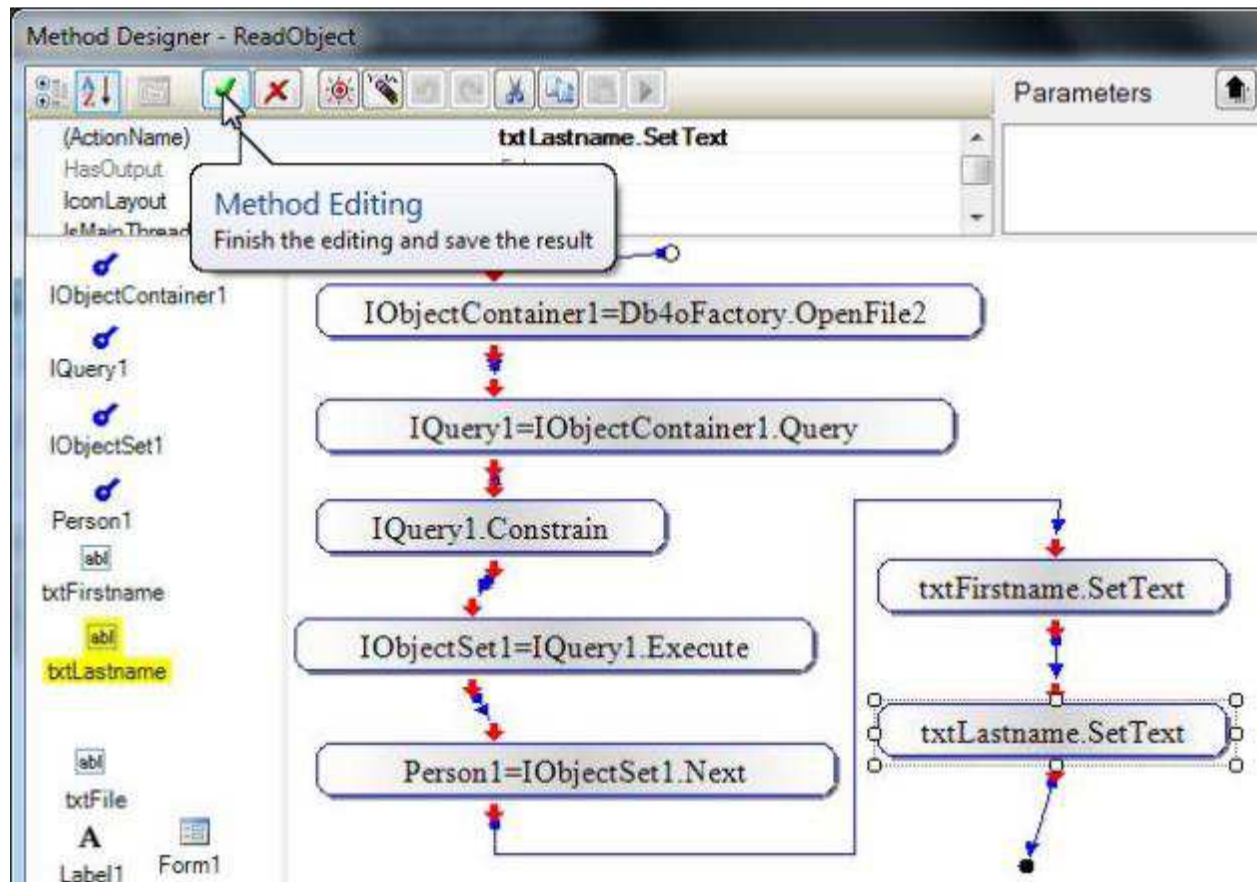
Choose Lastname of Person1; click “Next”:



Click OK to finish creating this action:



Link the actions together. We are done creating this method:



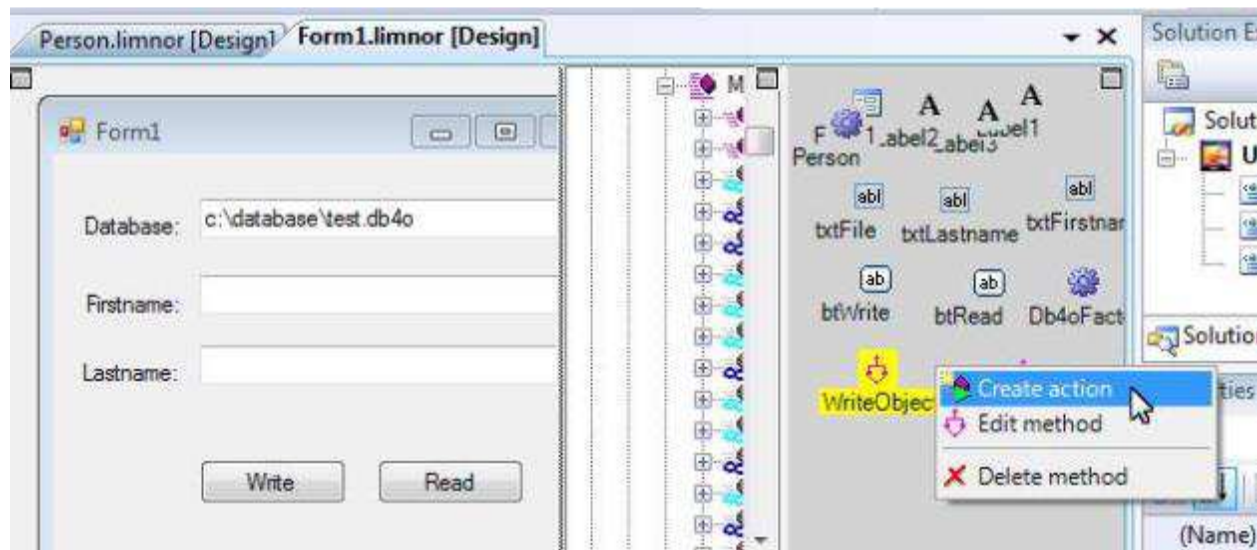
## Execute Actions

### Create actions

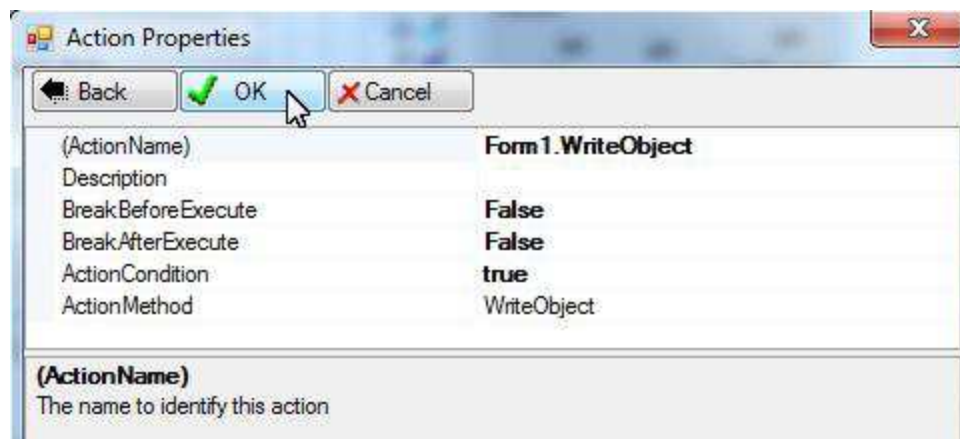
We have created two methods, WriteObject and ReadObject. We need to create actions using them.

Right-click WriteObject; choose "Create action":

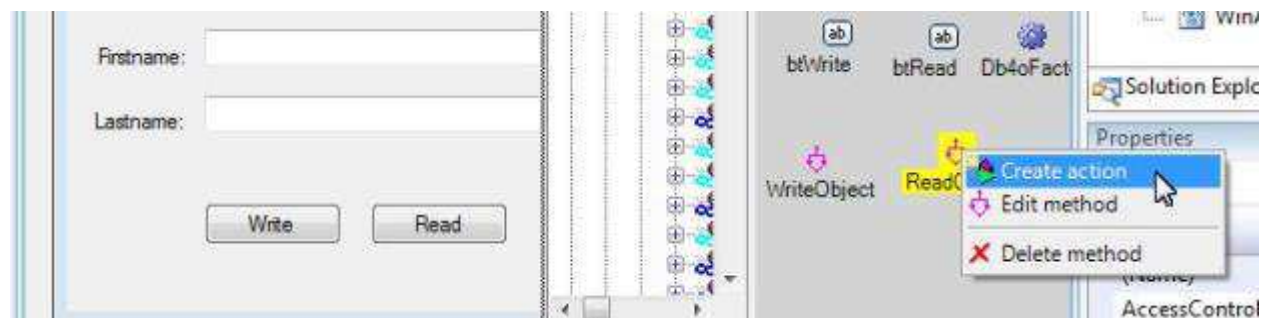




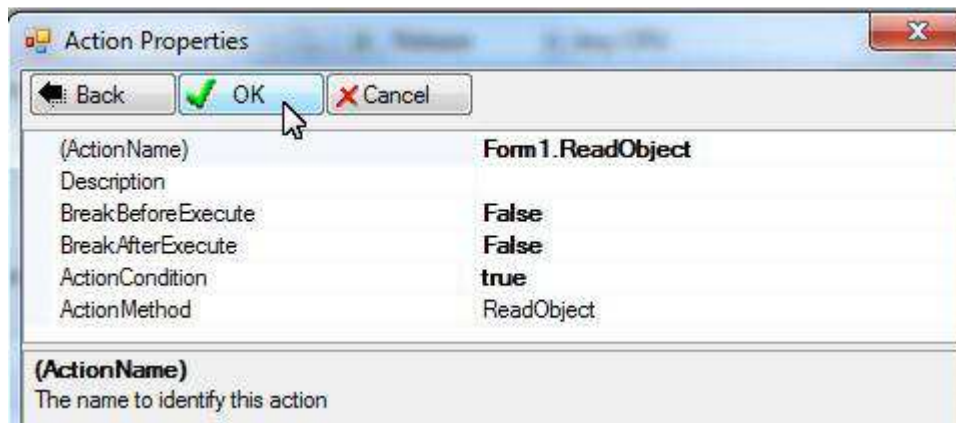
Click OK to finish creating this action:



Right-click ReadObject; choose "Create action":

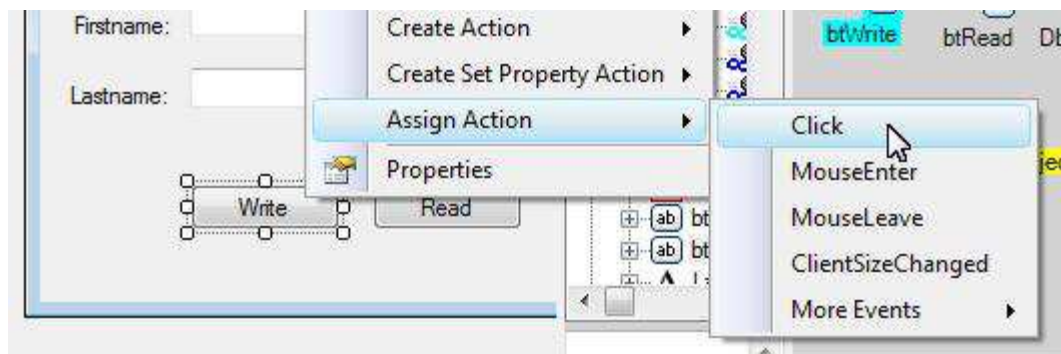


Click OK to finish creating this action:

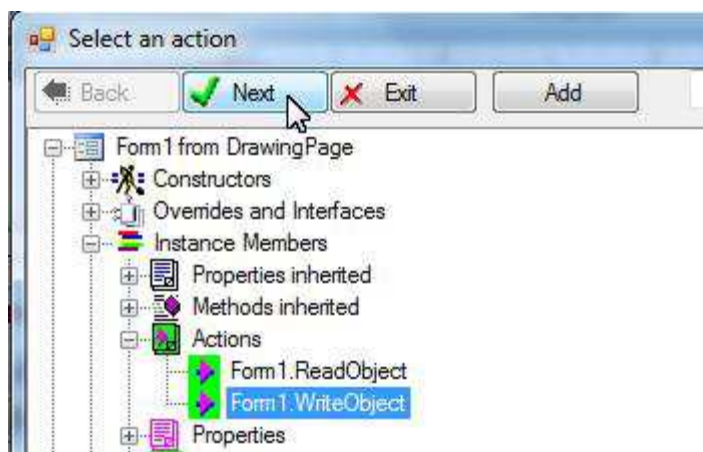


### Assign actions to events

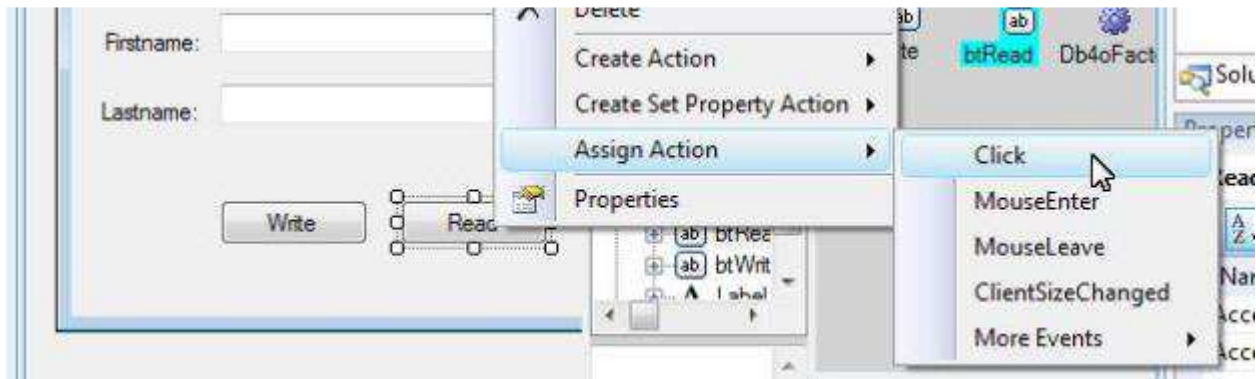
Right-click Write button; choose "Assign Action"; choose "Click":



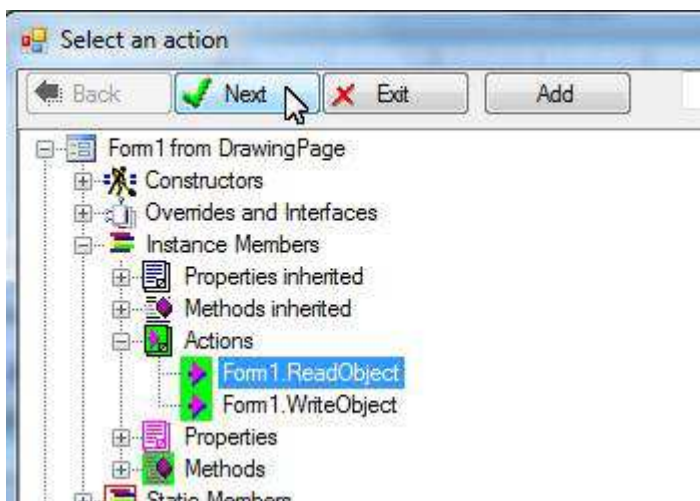
Choose WriteObject action; click "Next":



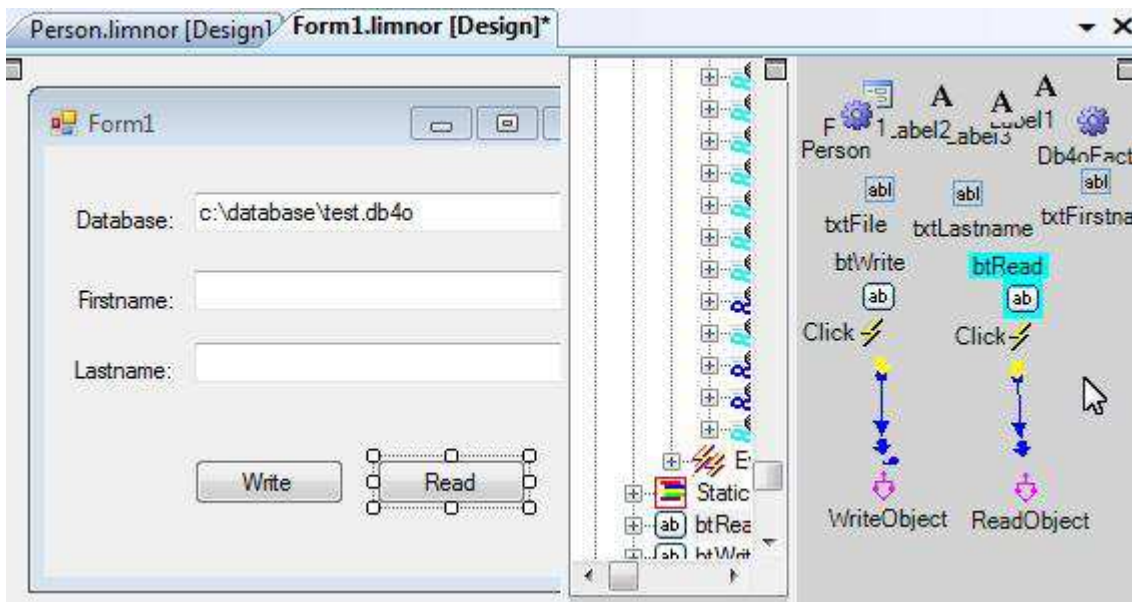
Right-click Read button; choose "Assign Action"; choose "Click":



Select ReadObject action; click “Next”:

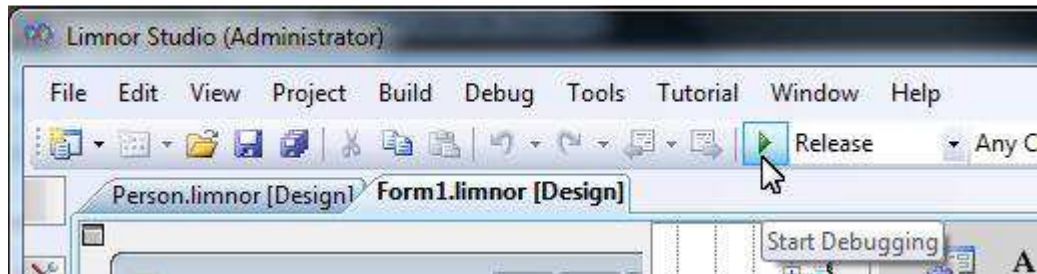


The actions are assigned to events:

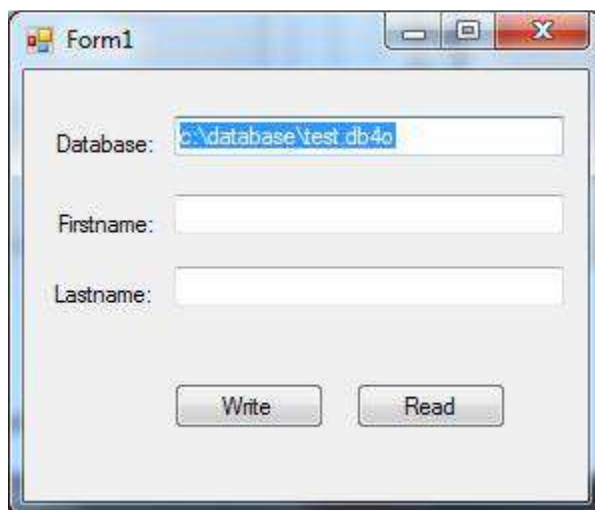


## Test

Click the Run button to compile and run the application:

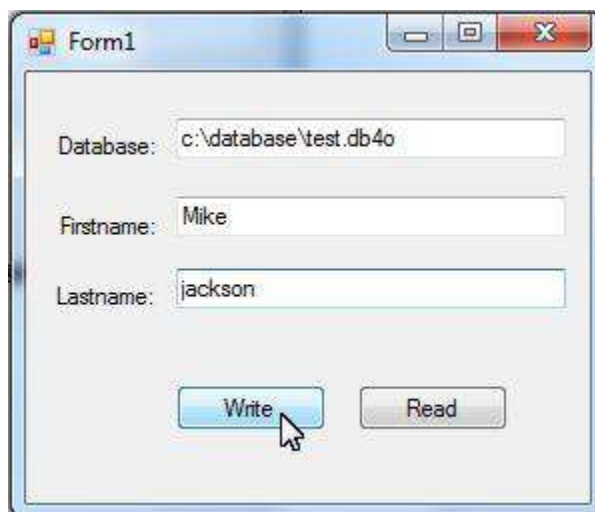


The Form1 appears after compiling:



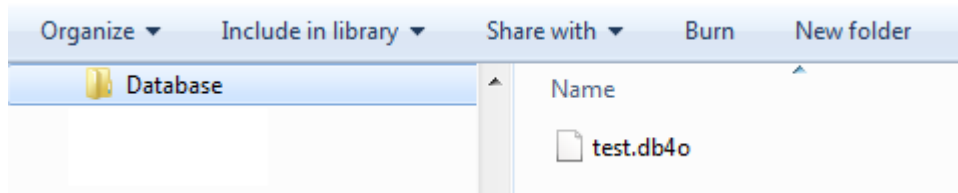
## Test writing

Enter first name and last name. Click Write button:



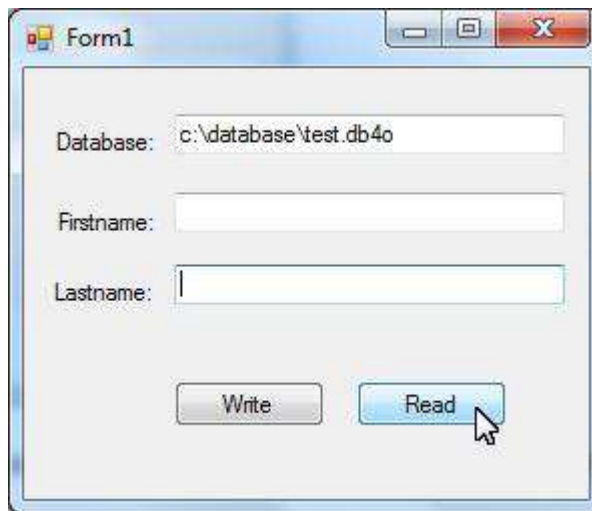


Originally file c:\database\test.db4o does not exist. On clicking Write button, this file is generated:

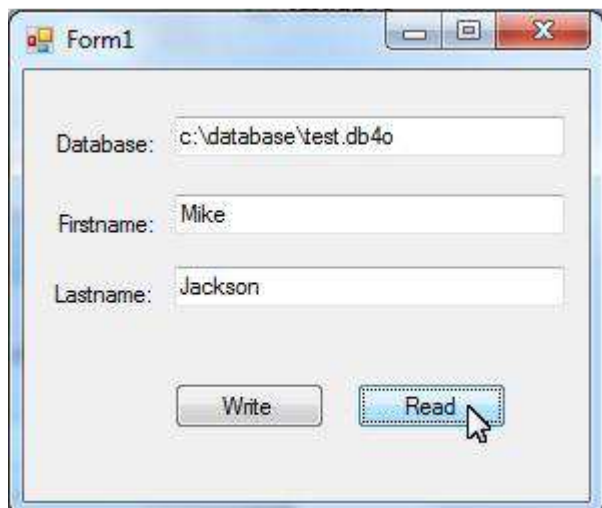


## Test reading

Before test reading, clear the text boxes. Then click Read button:



We can see that the first name and last name appear in the text boxes:



## Feedback

Please send your feedback to [support@limnor.com](mailto:support@limnor.com)