Add A Record To The Dataset And Update The Database

When you add a new record, you'll want to add it to the Dataset and the underlying database. Let's see how.

Add three new buttons to the form. Set the following properties for your buttons:

Name: btnAddNew
Text: Add New

Name: btnSave
Text: Save
Enabled: False

Name: btnCancel
Text: Cancel
Enabled: False

The Add New button won't actually add a new record. We'll use this button to clear the textboxes, ready for a new record to be added. We can also disable this button after it has been clicked, and enable the Save and Cancel buttons. The Save button is where we'll add the record to the Dataset and to the Database.

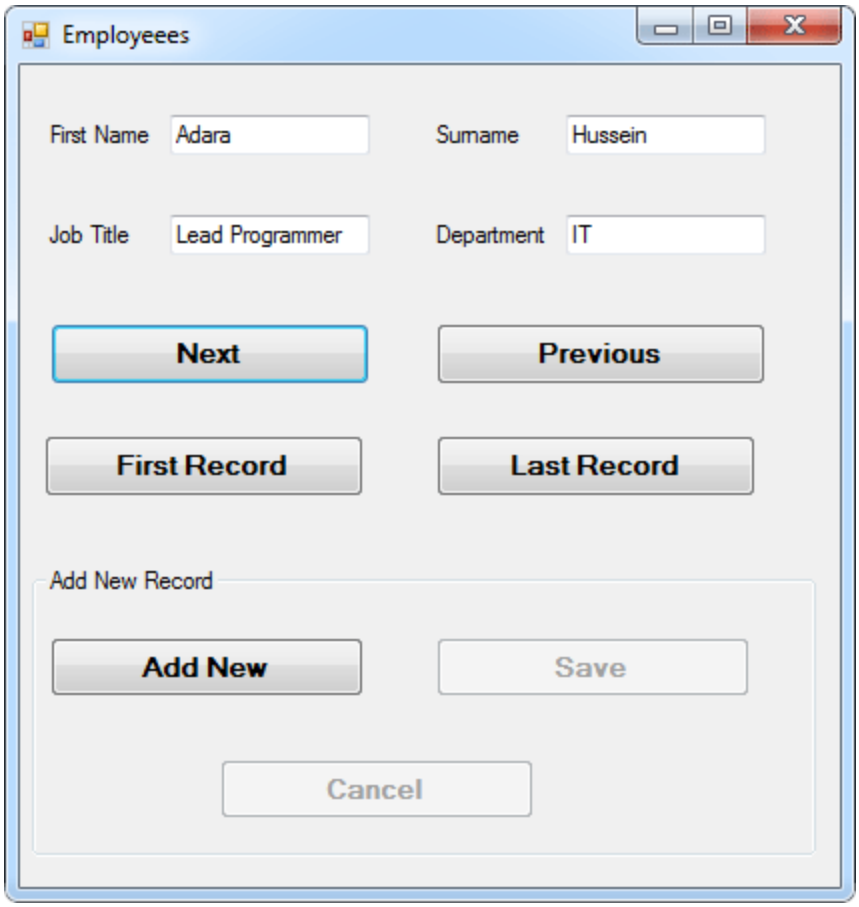
Double click your Add New button, and add code to clear the text boxes:

```
txtFirstName.Clear();
txtSurname.Clear();
txtJobTitle.Clear();
txtDepartment.Clear();
```

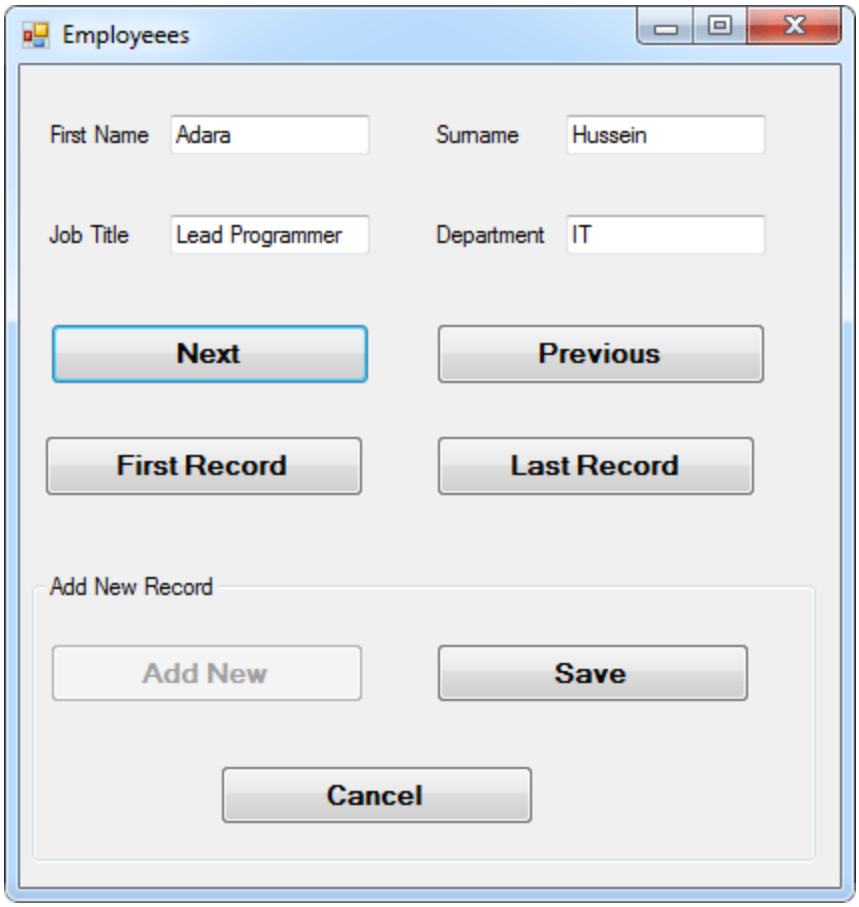
If the user clicks the Add New button then we want to disable it, and then switch on the Save and Cancel button. To do that, here's the code:

```
btnAddNew.Enabled = false;
btnSave.Enabled = true;
btnCancel.Enabled = true;
```

That's all we need to do here. You can test it out, if you want. When the form loads it will look like this (we've put our buttons on a GroupBox):



When you click the Add New button, the form will look like this:



But all the code does is to clear the four textboxes of text. The user can then enter a new record.

Return to Design Time and double click your Cancel button. What we need to do here is to call **NavigateRecords**. We need to do this because the textboxes are all blank. Calling NavigateRecords will put the record that was erased back into the textboxes.

The Cancel button also needs to reset all three buttons. Here's the code to add, then:

```
NavigateRecords( );

btnCancel.Enabled = false;
btnSave.Enabled = false;
btnAddNew.Enabled = true;
```

You can test it out. Click your Add New button when the form loads. The textboxes will go blank, and the first record will disappear. Now click Cancel. You should find that the record reappears.

Saving a New Record

After a new record has been entered into the text boxes, we can save it. Double click your Save button to get at the code.

To save a record, you need to do two things: save it to the Dataset, and save it to the underlying database. You need to do it this way because the Dataset with its copy of the records is disconnected from the database. Saving to the Dataset is NOT the same as saving to the database.

To add a record to the Dataset, you need to create a new Row:

```
DataRow row = ds.Tables[0].NewRow( );
```

This creates a new DataRow object that we've called **row**. The DataRow object is used to add new rows to a Dataset. But the new row will not have any data. To add data to the row, the format is this:

```
row[1] = txtFirstName.Text;
```

So after your DataRow variable (**row**) you need a pair of square brackets. In between the square brackets type its position in the Row. This is the Column number.
So **row[1]** refers to the **first_name** column, for us. After an equals sign, you type whatever it is you want to add to that Column - the text from **txtFirstName**, in our case.

Finally, you issue the Add command:

```
ds.Tables[0] Rows.Add( row );
```

After **Add**, and in between a pair of round brackets, you type the name of the row you want to add, which was **row** in our example. The new row will then get added to the end of the Dataset.

So add this code to your Save button:

```
DataRow row = ds.Tables[0].NewRow( );
row[1] = txtFirstName.Text;
row[2] = txtSurname.Text;
row[3] = txtJobTitle.Text;
row[4] = txtDepartment.Text;

ds.Tables[0].Rows.Add(row);
```

To actually update the database, we need to add a new method to our class. This method will use the **DataAdapter** we set up. The DataAdapter is linked to the database itself, and can issue Update, Insert and Delete commands. It's quite easy to do and only takes a couple of lines.

If your DatabaseConnections class is not open, double click it in the Solution Explorer to get at the code. Now add the following method:

```
public void UpdateDatabase( System.Data.DataSet ds )
{

}
```

So this is a **public** method that doesn't return a value (**void**). We called it **UpdateDatabase**. In between the round brackets of UpdateDatabase have a look at what the code is:

```
System.Data.DataSet ds
```

This is a DataSet being passed to the method. The name of the DataSet is **ds**. Our DataSet, remember, is where all the records are kept, even the ones that have changed. We'll be updating the database with these new changes.

In order to do an automatic update, you need something called a **CommandBuilder**. This is initialised with the name of a DataAdapter, the DataAdapter we set up earlier in the Class.

Add this rather long line to your method (it should be on one line in your code):

```
System.Data.SqlClient.SqlCommandBuilder cb = new
System.Data.SqlClient.SqlCommandBuilder( da_1 );
```

We've called our CommandBuilder **cb**. At the end, in between round brackets, we have the name of our DataAdapter, which was **da_1**.

Now that we have a CommandBuilder, we can do something with it. Add this line to your method:

```
cb.DataAdapter.Update( ds.Tables[0] );
```

The CommandBuilder has a property called **DataAdapter**. This property has a method of its own called **Update**. The Update method takes the name of a DataSet and a table. The DataSet for us is **ds**, which is the one we passed in to our UpdateDatabase method when we set it up. After a dot, you type the name of a table in your dataset.

Here's what your method should look like:

```
public void UpdateDatabase(System.Data.DataSet ds)
{
    System.Data.SqlClient.SqlCommandBuilder cb = new System.Data.SqlClient.SqlCommandBuilder(da_1);

    cb.DataAdapter.Update(ds.Tables[0]);

}
```

And that's it. That's enough to update the underlying database with your new record. Of course, we have yet to call our new method into action.

Go back to the code for your Save button. Add a **try … catch** statement:

```
try
{

}
catch (Exception err)
{

    MessageBox.Show(err.Message);

}
```

For the try part, add the following:

```
try
{

    objConnect.UpdateDatabase(ds);

    MaxRows = MaxRows + 1;
    inc = MaxRows - 1;

    MessageBox.Show("Database updated");

}
```

As the first line of the try part, we have this:

```
objConnect.UpdateDatabase(ds);
```

Here, we access our DatabaseConnections object (**objConnect**), and call our new method **UpdateDatabase**. In between the round brackets of our UpdateDatabase method we have the name of our DataSet, which is **ds**. This contains all the records we pulled from the database, and any amendments we've made. We're handing the whole

thing over to the new method, where the CommandBuilder and DataAdapter will take care of the updates for us.

Notice the next two lines:

MaxRows = MaxRows + 1;
inc = MaxRows - 1;

Because we have added a new Row to the Dataset, we also need to add 1 to the **MaxRows** variable. The **inc** variable can be set to the last record in the Dataset, which is **MaxRows - 1**.

The final three lines of our Save code are these:

btnCancel.Enabled = false;
btnSave.Enabled = false;
btnAddNew.Enabled = true;

These three lines just reset the buttons to their original state.

The whole of the code for your Save button should look like this:

```
private void btnSave_Click(object sender, EventArgs e)
{
    DataRow row = ds.Tables[0].NewRow();
    row[1] = txtFirstName.Text;
    row[2] = txtSurname.Text;
    row[3] = txtJobTitle.Text;
    row[4] = txtDepartment.Text;

    ds.Tables[0].Rows.Add(row);

    try
    {
        objConnect.UpdateDatabase(ds);
        MaxRows = MaxRows + 1;
        inc = MaxRows - 1;

        MessageBox.Show("Database updated");
    }
    catch (Exception err)
    {
        MessageBox.Show(err.Message);
    }

    btnCancel.Enabled = false;
    btnSave.Enabled = false;
    btnAddNew.Enabled = true;
}
```

Try it out. When you start your programme, click the Add New button to clear the textboxes. Enter a new record in the blank textboxes and then click your Save button. Click your Previous and Next buttons. You'll see that the new record appears. When you close down your project and open it up again, the new record should still be there.

(If the new record doesn't appear when you restart, go back to Design Time. In the Solution Explorer, click on your Database under Resources to select it. Now have a look at the Properties window below the Solution Explorer. Locate a property called **Copy to Output Directory**. It has three settings: **Do not copy**, **Copy always**, and **Copy if newer**. If your database is not updating, try either **Copy if newer** or **Copy always**.)

In the next lesson, you'll learn how to update a record, and how to delete a record

Update A Record, Delete A Record

Update a Record

Sometimes, all you want to do is to update a record in the database, change a name, for example, or amend an address.

Add a new button to your form. Call it **btnUdate**. Double click the button to get at the code. Add the following lines:

```
DataRow row = ds.Tables[0].Rows[inc];

row[1] = txtFirstName.Text;
row[2] = txtSurname.Text;
row[3] = txtJobTitle.Text;
row[4] = txtDepartment.Text;
```

This is very similar to the code for adding a new record. Again we start by creating a DataRow object. This time, we place a specific row in the new object. That row is one from the DataSet:

```
ds.Tables[0].Rows[ inc ];
```

However, this is the old row. The new details are in the textboxes, the ones you may have amended. To place the new details into the new row object, we simply transfer the textbox date to a position in the row object:

```
row[1] = txtFirstName.Text;
row[2] = txtSurname.Text;
row[3] = txtJobTitle.Text;
row[4] = txtDepartment.Text;
```

All we need to do now is to make a call to the **UpdateDatabase** method from our class. Again, we can do this in a **try … catch** block:

```
try
{

    objConnect.UpdateDatabase(ds);

    MessageBox.Show("Record Updated");

}
catch (Exception err)
{

    MessageBox.Show(err.Message);

}
```

The only line we really need is this one:

```
objConnect.UpdateDatabase(ds);
```

This is the same as before: we're just passing our UpdateDatabase method the name of the DataSet, which is called **ds**.

The whole of the **btnUpdate** code is this:

```
private void btnUpdate_Click(object sender, EventArgs e)
{
    DataRow row = ds.Tables[0].Rows[inc];

    row[1] = txtFirstName.Text;
    row[2] = txtSurname.Text;
    row[3] = txtJobTitle.Text;
    row[4] = txtDepartment.Text;

    try
    {
        objConnect.UpdateDatabase(ds);

        MessageBox.Show("Record Updated");
    }
    catch (Exception err)
    {
        MessageBox.Show(err.Message);
    }

}
```

Try it out. Run your form and amend one of the records. Click your Update button. When you close the form down and open it back up again, the amended record will display.

Delete a Record

To delete a record from the Dataset, you use the **Delete** method on the DataSet:

```
ds.Tables[0].Rows[inc].Delete( );
```

This is enough to Delete the entire Row (**Rows[inc]**). But it is only deleted from the Dataset. To delete if from the underlying database as well, we can call our **UpdateDatabase** method again.

```
objConnect.UpdateDatabase(ds);
```

Because a row has been deleted, we need to change the value of our **MaxRows** variable. We also need to deduct 1 from the **inc** variable, and make a call **NavigateRecords**:

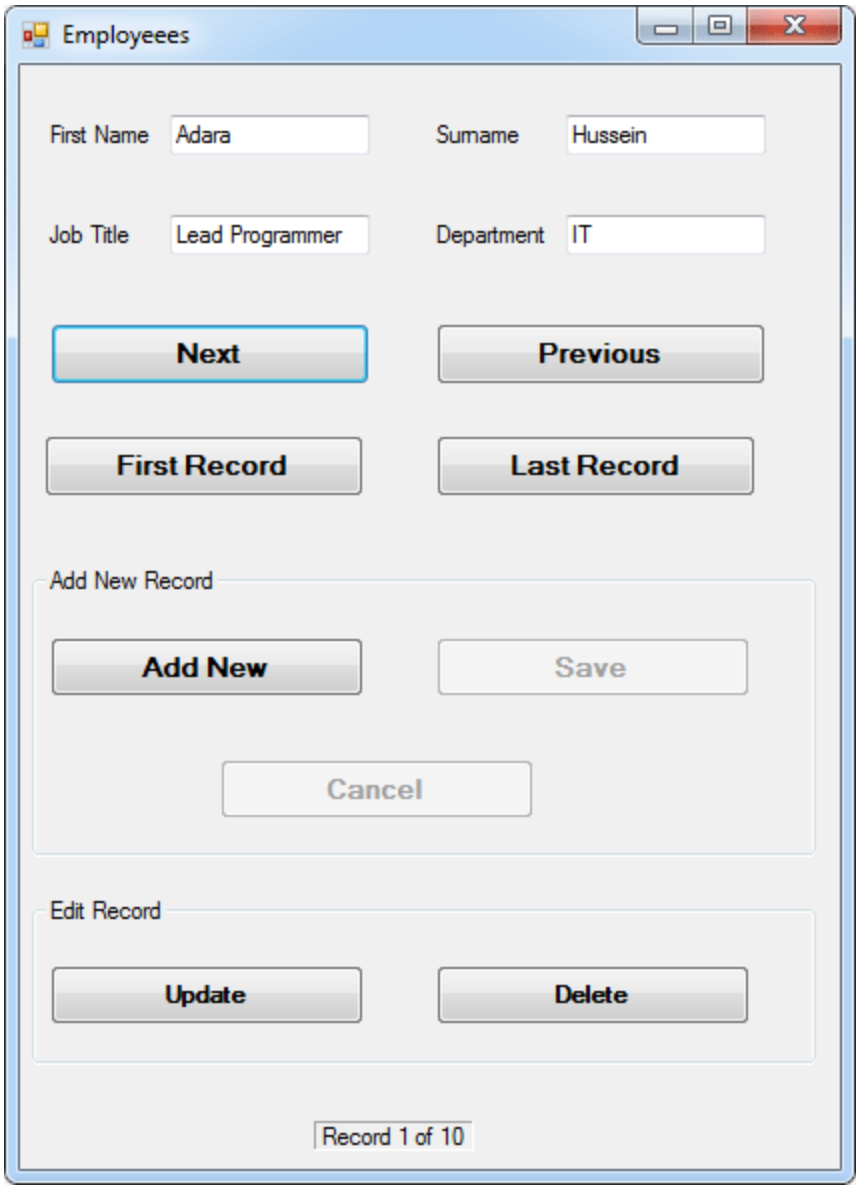
```
MaxRows = ds.Tables[0].Rows.Count;
inc--;

NavigateRecords();
```

Add another button to your form. Call it **btnDelete**. Here's the whole of the code to add to your new button, along with a try ... catch statement:

```
private void btnDelete_Click(object sender, EventArgs e)
{
    try
    {
        ds.Tables[0].Rows[inc].Delete();
        objConnect.UpdateDatabase(ds);

        MaxRows = ds.Tables[0].Rows.Count;
        inc--;
        NavigateRecords();

        MessageBox.Show("Record Deleted");
    }
    catch (Exception err)
    {
        MessageBox.Show(err.Message);
    }

}
```

Try it out. Run your form. Navigate to a record you want to delete, then press your Delete button. Close your form and reopen it. The record you delete should be gone.

Exercise P
Examine this version of our form:



If you look at the bottom, you'll see a label that says **Record 1 of 10**. Implement this in your own programme. If you set up a method, you can just call it from **NavigateRecords**.

OK, that's enough of databases! It's a huge subject, obviously, and many books have been written on the subject. We've only touched the surface in these lessons, and encourage you to delve deeper. Especially if you want a job as a programmer!