



WinForm/C# Database App

using ADO.NET

Database Tables

STUDENT

StudentId
ClassId (FK)
StudentName
StudentNumber
TotalGrade
Address
Phone
Email

STUDENT_COURSE

StudentId (FK)
CourseId (FK)

GRADE

GradeId
StudentId (FK)
CourseId (FK)
Grade
Comment

COURSE

CourseId
CourseName
SchoolId (FK)
Description

SCHOOL

SchoolId
SchoolName
Description
Address
Phone
PostCode
PostAddress

CLASS

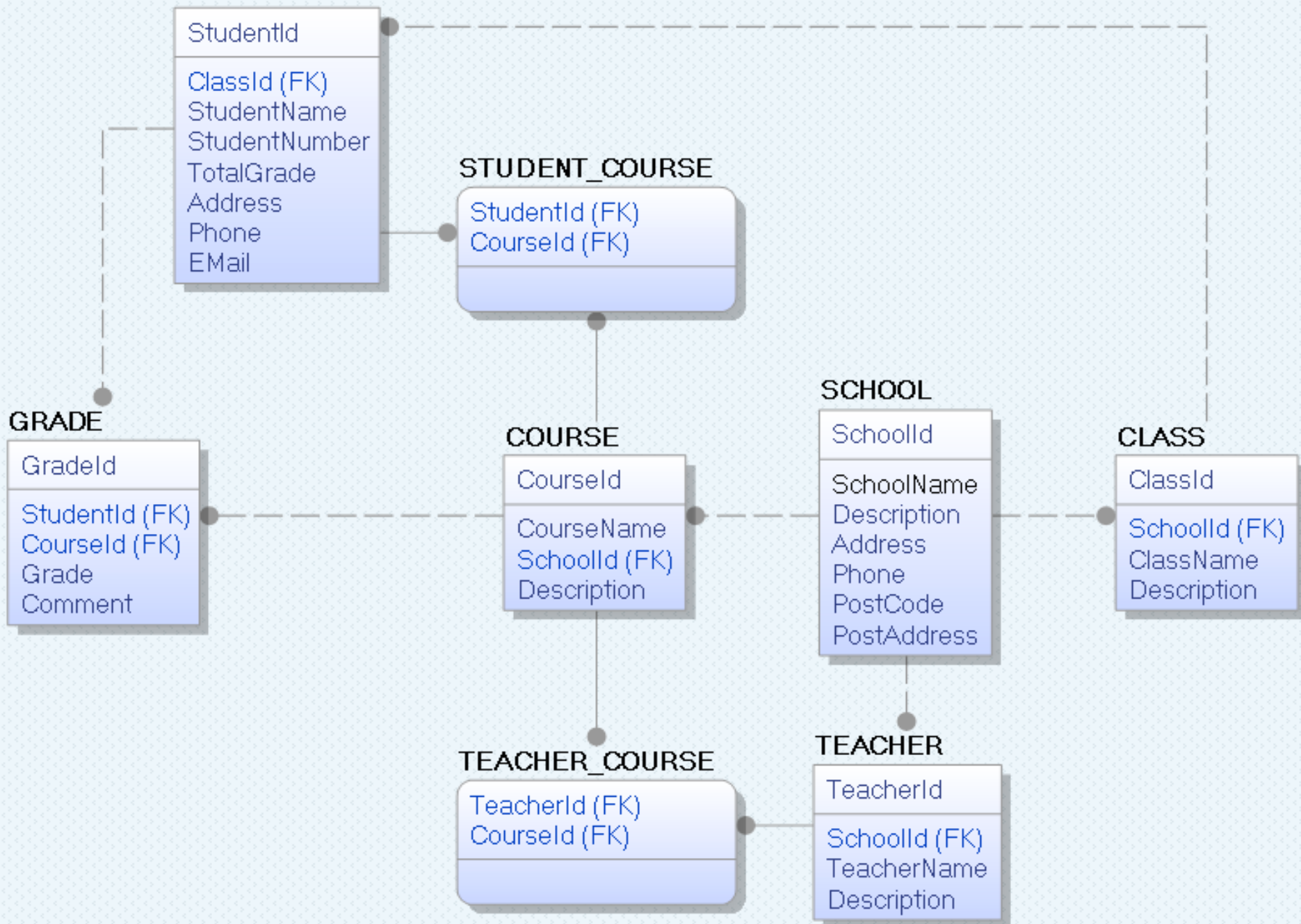
ClassId
SchoolId (FK)
ClassName
Description

TEACHER_COURSE

TeacherId (FK)
CourseId (FK)

TEACHER

TeacherId
SchoolId (FK)
TeacherName
Description



Execute the different Scripts inside SQL Server Management Studio

```
/*
Last Updated Date: 2011.04.01
Last Updated By:  hans.p.halvorsen@hit.no
Description:      Lab Work - School Tables

(C) Hans-Petter Halvorsen
*/

/*
SCHOOL
CLASS
COURSE
TEACHER
TEACHER_COURSE
STUDENT
STUDENT_COURSE
GRADE
*/

if not exists (select * from dbo.sysobjects where id = object_id(N'[SCHOOL]') and OBJECTPROPERTY(id, N'IsUserTable') = 1)
CREATE TABLE [SCHOOL]
(
    [SchoolId] [int] IDENTITY(1, 1) NOT NULL PRIMARY KEY,
    [SchoolName] [varchar](50) NOT NULL UNIQUE,
    [Description] [varchar](1000) NULL,
    [Address] [varchar](50) NULL,
    [Phone] [varchar](50) NULL,
    [PostCode] [varchar](50) NULL,
    [PostAddress] [varchar](50) NULL,
)
GO

if not exists (select * from dbo.sysobjects where id = object_id(N'[CLASS]') and OBJECTPROPERTY(id, N'IsUserTable') = 1)
CREATE TABLE [CLASS]
(
    [ClassId] [int] IDENTITY(1, 1) NOT NULL PRIMARY KEY,
    [SchoolId] [int] NOT NULL FOREIGN KEY REFERENCES [SCHOOL] ([SchoolId]),
    [ClassName] [varchar](50) NOT NULL,
    [Description] [varchar](1000) NULL,
)
GO

if not exists (select * from dbo.sysobjects where id = object_id(N'[COURSE]') and OBJECTPROPERTY(id, N'IsUserTable') = 1)
CREATE TABLE [COURSE]
(
    [CourseId] [int] IDENTITY(1, 1) NOT NULL PRIMARY KEY,
```

100 %
Connected. (1/1)

macwin8 (11.0 RTM) | MACWIN8\Hans-Petter (53) | SCHOOL | 00:00:00 | 0 rows

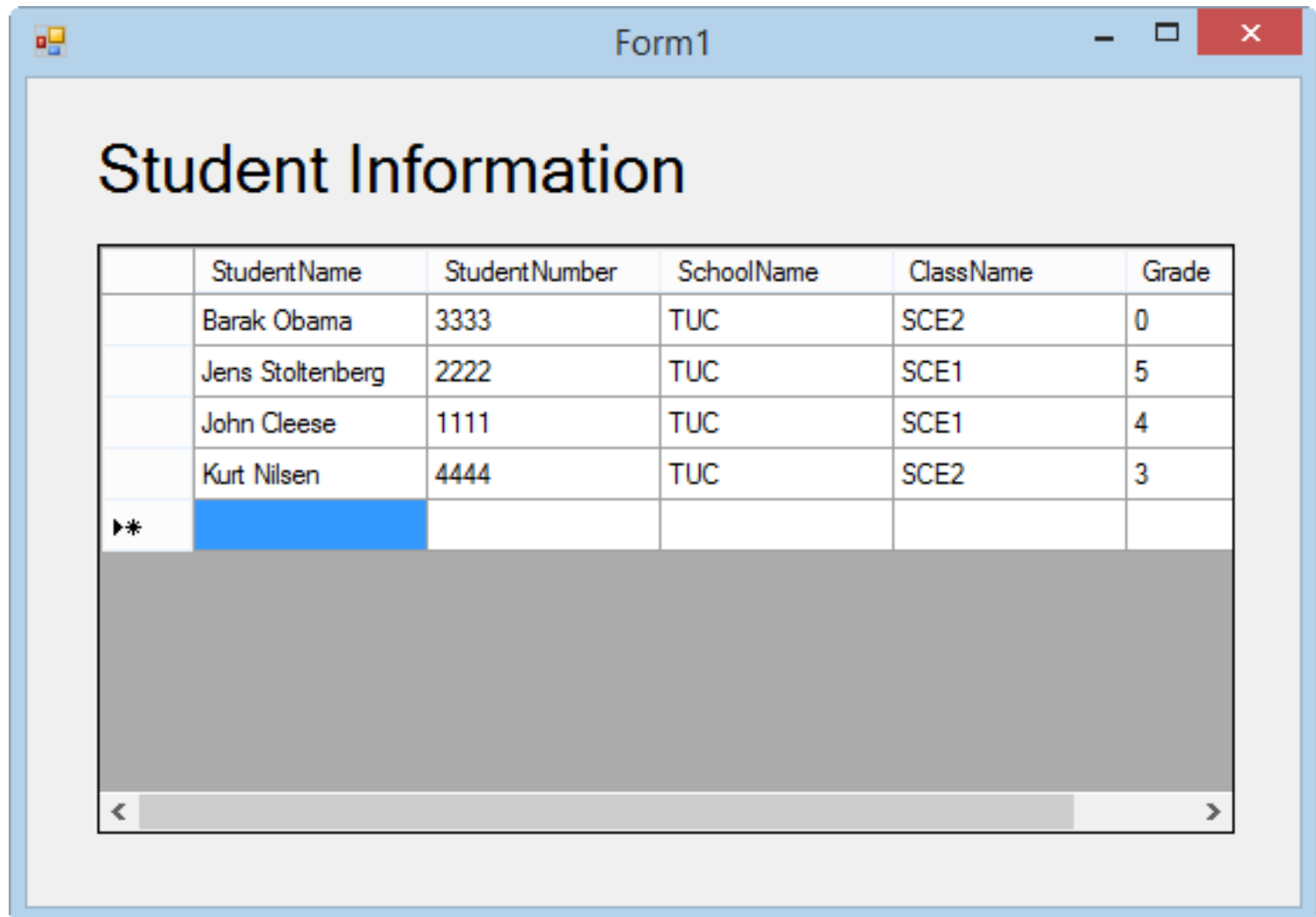
Ln 1

Col 1

Ch 1

INS

This Example shows how to create a WinForm App that gets Data from a Database into a DataGridView

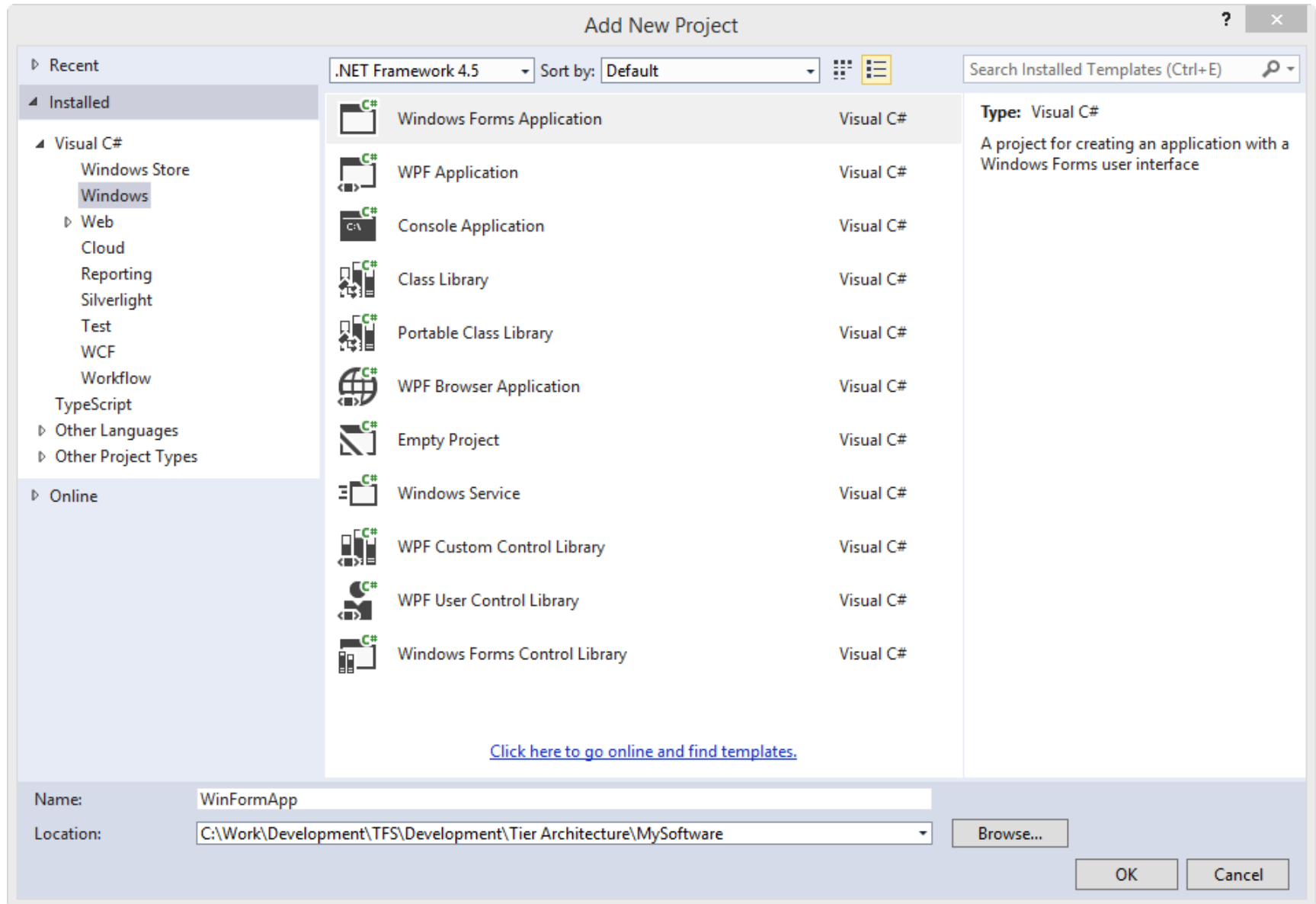


The screenshot shows a Windows Form titled "Form1" with a light blue border. Inside the form, the title "Student Information" is displayed in a large, bold, black font. Below the title is a DataGridView control. The DataGridView has five columns: "StudentName", "StudentNumber", "SchoolName", "ClassName", and "Grade". The data is as follows:

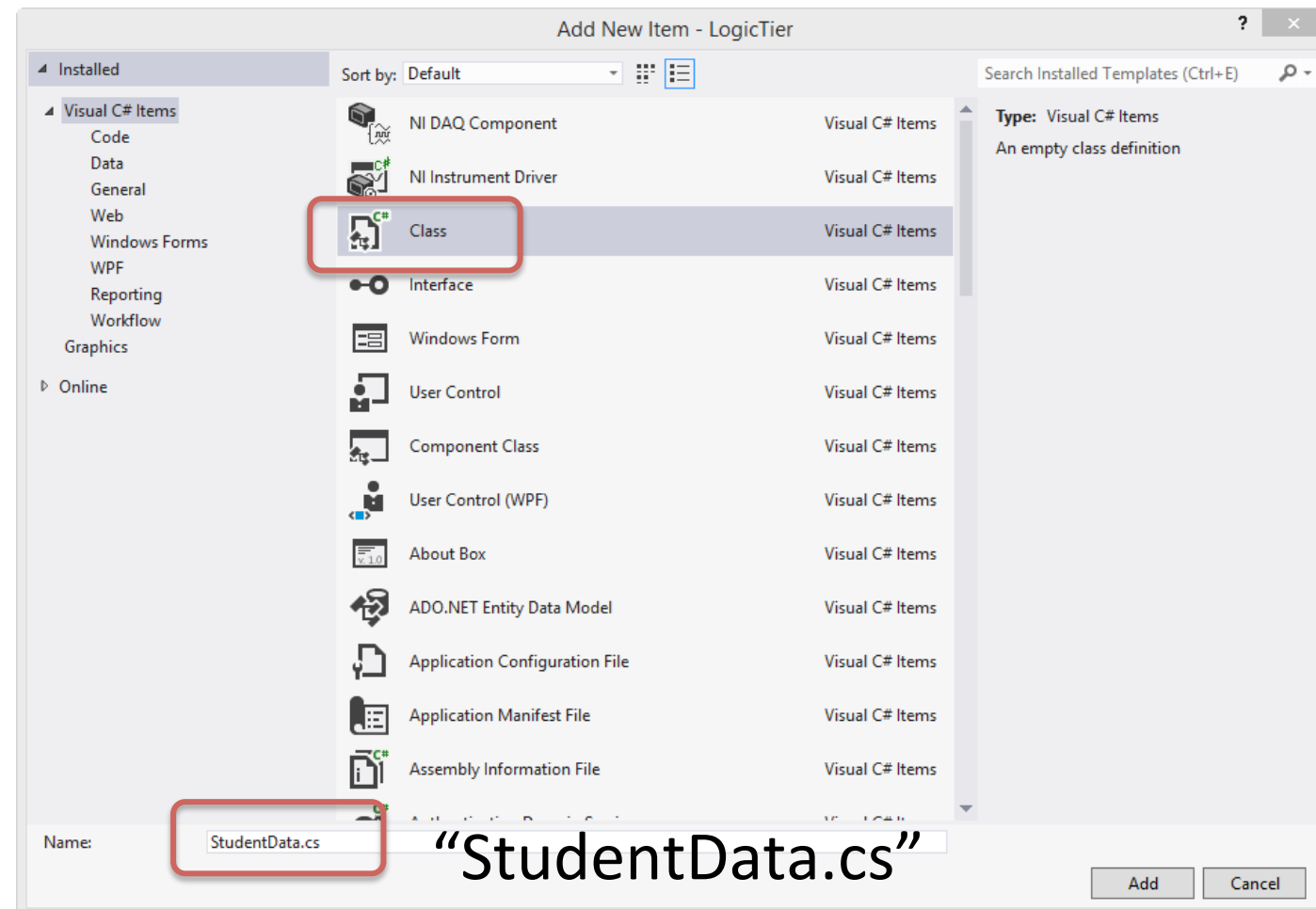
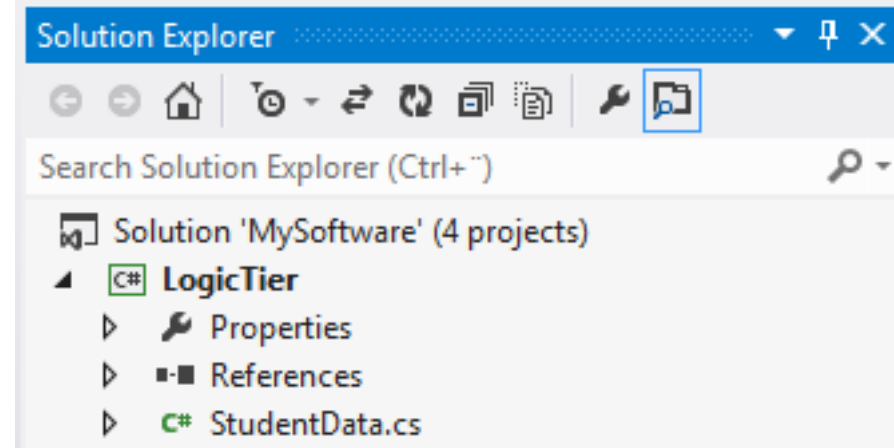
	StudentName	StudentNumber	SchoolName	ClassName	Grade
	Barak Obama	3333	TUC	SCE2	0
	Jens Stoltenberg	2222	TUC	SCE1	5
	John Cleese	1111	TUC	SCE1	4
	Kurt Nilsen	4444	TUC	SCE2	3
»*					

The fifth row is highlighted in blue, indicating it is the current row being added or edited. Below the table, there is a large gray rectangular area, likely a placeholder for additional data or a scrollable region. At the bottom of the DataGridView, there is a horizontal scrollbar with left and right arrow buttons.

Add a WinForm Project



Add a New **Class** to the Project (“StudentData.cs”)



Create the **Code**, e.g., like this (“StudentData.cs”):

StudentData.cs

Tuc.School.LogicTier.StudentData

GetStudentDB(string connectionString)

```
using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using System.Threading.Tasks;
using System.Data.SqlClient;
using System.Data.SqlTypes;
using System.Data;

namespace Tuc.School.LogicTier
{
    public class StudentData
    {
        public DataSet GetStudentDB(string connectionString)
        {
            string selectSQL = "select StudentName, StudentNumber, SchoolName, ClassName, Grade from StudentData order by StudentName";

            // Define the ADO.NET objects.
            SqlConnection con = new SqlConnection(connectionString);

            SqlDataAdapter da = new SqlDataAdapter(selectSQL, con);

            DataSet ds = new DataSet();
            da.Fill(ds);

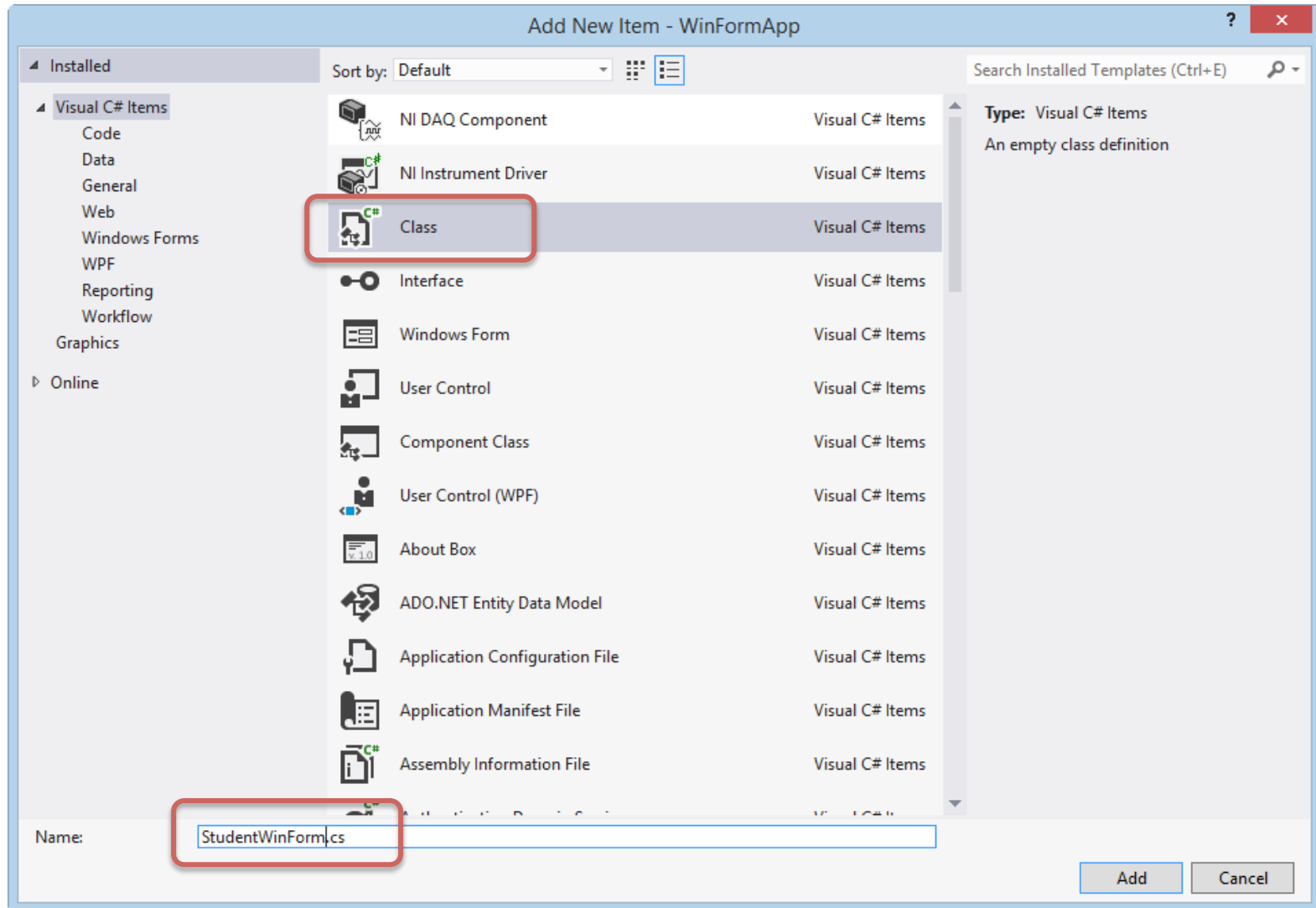
            return ds;
        }
    }
}
```

SQL Query

A View that collects data from several tables

Improvements: Use Try... Catch ...

Add a New Class (“StudentWinForm.cs”)



Add Code in Class

```
StudentWinForm.cs [X]
Tuc.School.WinFormsApp.StudentWinForm

using System;
using System.Collections.Generic;
using System.Linq;
using System.Text;
using System.Threading.Tasks;

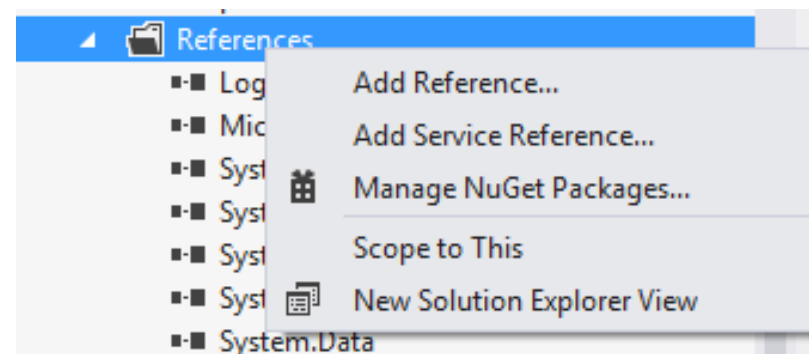
using System.Data;

using Tuc.School.LogicTier;


namespace Tuc.School.WinFormsApp
{
    class StudentWinForm
    {
        public DataSet GetStudent(string connectionString)
        {
            StudentData studentData = new StudentData();

            return studentData.GetStudentDB(connectionString);
        }
    }
}
```

Add a Reference to the Assembly in the Logic Tier



Code for Class “StudentWinForm.cs”

```
using System.Data;  Since we are using the DataSet Class
using Tuc.School.LogicTier;

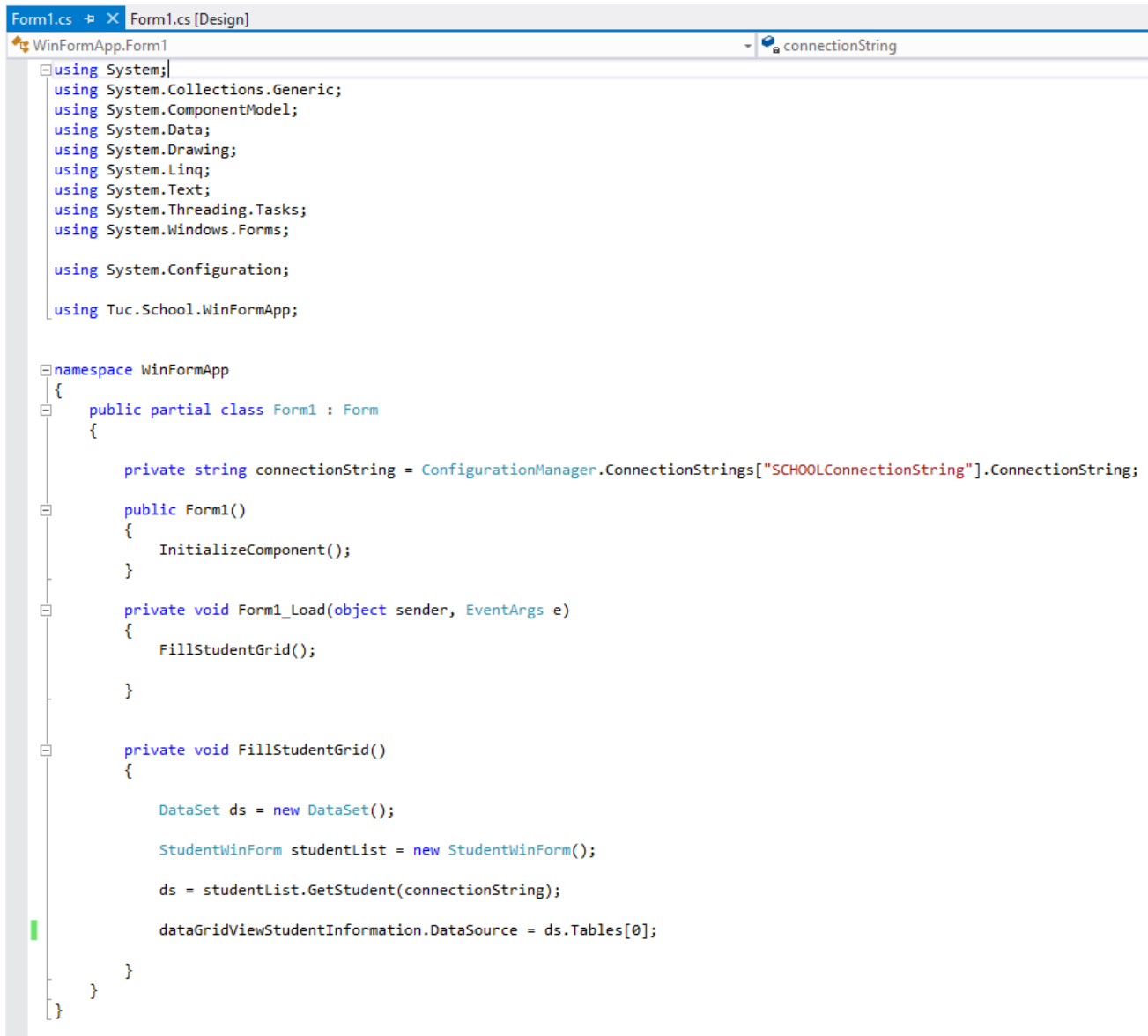
namespace Tuc.School.WinFormsApp
{
    class StudentWinForm
    {
        public DataSet GetStudent(string connectionString)
        {
            StudentData studentData = new StudentData();

            return studentData.GetStudentDB(connectionString);
        }
    }
}
```

Create Form

The image shows a Windows Form titled "Form1". The form has a light gray background. At the top left, the text "Student Information" is displayed in a large, bold, black font. To the right of this text, the word "Label" is written in a smaller, regular black font. Below the text, there is a large, gray rectangular area representing a "DataGridView". The "DataGridView" is outlined with a dotted border and has small white squares at the corners and midpoints of the sides, indicating it is a resizable control. The form's title bar is light blue and contains the text "Form1" and standard Windows window controls (minimize, maximize, close).

Create Form Code



```
Form1.cs [Design]
WinFormApp.Form1
connectionString

using System;
using System.Collections.Generic;
using System.ComponentModel;
using System.Data;
using System.Drawing;
using System.Linq;
using System.Text;
using System.Threading.Tasks;
using System.Windows.Forms;

using System.Configuration;
using Tuc.School.WinFormsApp;

namespace WinFormApp
{
    public partial class Form1 : Form
    {
        private string connectionString = ConfigurationManager.ConnectionStrings["SCHOOLConnectionString"].ConnectionString;

        public Form1()
        {
            InitializeComponent();
        }

        private void Form1_Load(object sender, EventArgs e)
        {
            FillStudentGrid();
        }

        private void FillStudentGrid()
        {
            DataSet ds = new DataSet();

            StudentWinForm studentList = new StudentWinForm();

            ds = studentList.GetStudent(connectionString);

            dataGridViewStudentInformation.DataSource = ds.Tables[0];
        }
    }
}
```

WinForm Code

```
using System.Configuration;
using Tuc.School.WinFormApp;
```

```
namespace WinFormApp
{
```

```
    public partial class Form1 : Form
    {
```

```
        private string connectionString =
            ConfigurationManager.ConnectionStrings["SCHOOLConnectionString"].ConnectionString;
```

```
        public Form1()
        {
            InitializeComponent();
        }
```

```
        private void Form1_Load(object sender, EventArgs e)
        {
            FillStudentGrid();
        }
```

```
        private void FillStudentGrid()
        {
            DataSet ds = new DataSet();

            StudentWinForm studentList = new StudentWinForm();

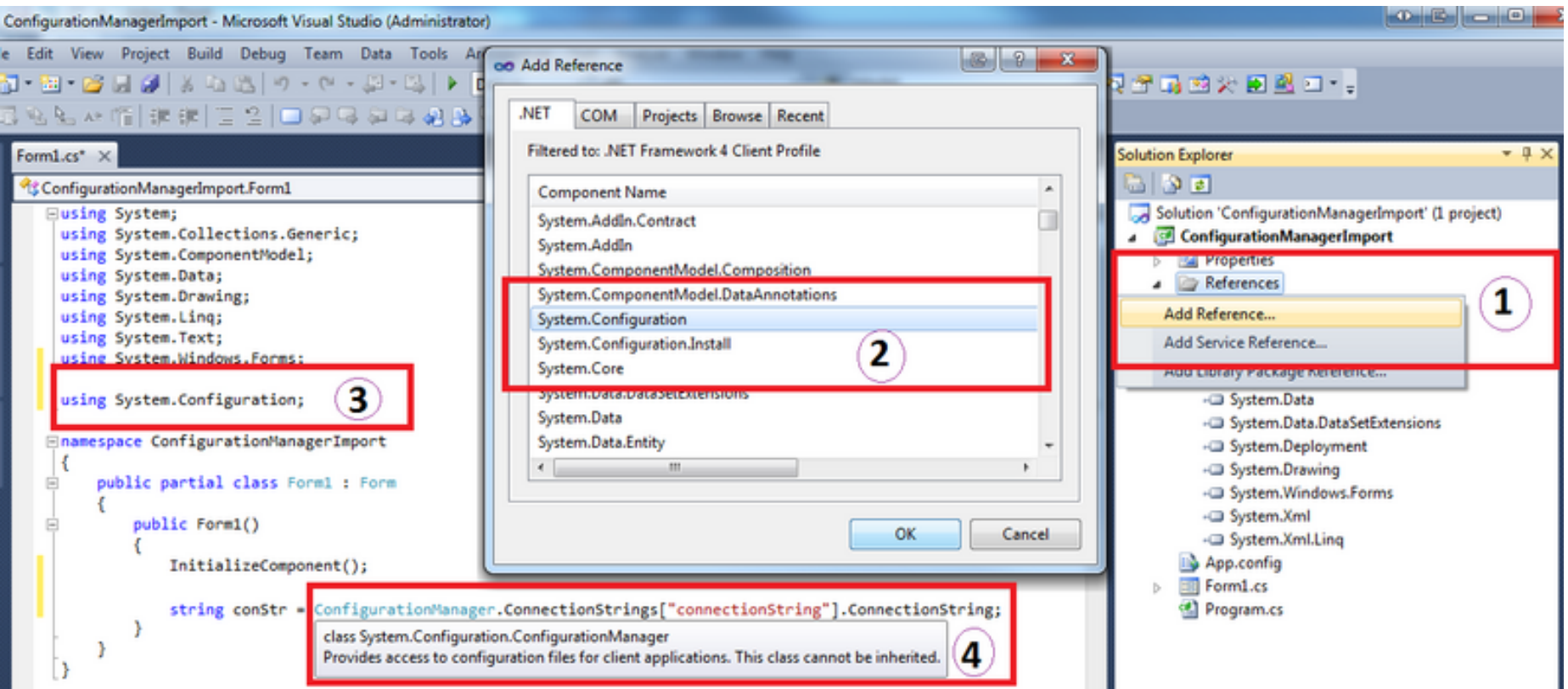
            ds = studentList.GetStudent(connectionString);

            dataGridViewStudentInformation.DataSource = ds.Tables[0];
        }
    }
}
```

Note!

ConnectionString is
stored in App.config

Note! Add “System.Configuration” Reference



Create DB ConnectionString in App.config

```
<?xml version="1.0" encoding="utf-8" ?>
<configuration>

    <startup>
        <supportedRuntime version="v4.0" sku=".NETFramework,Version=v4.5" />
    </startup>

    <connectionStrings>
        <add name="SCHOOLConnectionString" connectionString="Data Source=macwin8;Initial Catalog=SCHOOL;Persist Security
Info=True;User ID=sa;Password=xxxxxx"
            providerName="System.Data.SqlClient" />
    </connectionStrings>

</configuration>
```

App.config

```
<?xml version="1.0" encoding="utf-8" ?>
<configuration>

    <startup>
        <supportedRuntime version="v4.0" sku=".NETFramework,Version=v4.5" />
    </startup>

    <connectionStrings>
        <add name="SCHOOLConnectionString" connectionString="Data Source=macwin8;Initial Catalog=SCHOOL;Persist Security Info=True;User ID=sa;Passwor
        providerName="System.Data.SqlClient" />
    </connectionStrings>

</configuration>
```

Test it

Form1

Student Information

	StudentName	StudentNumber	SchoolName	ClassName	Grade
	Barak Obama	3333	TUC	SCE2	0
	Jens Stoltenberg	2222	TUC	SCE1	5
	John Cleese	1111	TUC	SCE1	4
	Kurt Nilsen	4444	TUC	SCE2	3
▶*					

< >

It works!!!

Recommended Litterature



- Tutorial: Introduction to Database Systems
<http://home.hit.no/~hansha/?tutorial=database>
- Tutorial: Structured Query Language (SQL)
<http://home.hit.no/~hansha/?tutorial=sql>
- Tutorial: Using SQL Server in C#
- Tutorial: Introduction to Visual Studio and C#
<http://home.hit.no/~hansha/?tutorial=csharp>



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