

# 1 C#, .NET, & SQL Server

This document discusses some general principles in developing database applications using C#<sup>1</sup>, .NET, and Microsoft SQL Server. We'll develop a command line database application to manage contacts. General ideas apply to the GUI oriented version—in fact, that's the homework: To create a GUI version of this thing.

## 2 Setup

For this whole scheme to work, you need a few tools. These include:

- .NET Framework SDK<sup>2</sup>
- Microsoft SQL Server

The .NET Framework SDK is a *free* download from the Microsoft website. You go to the Microsoft website, click on download, select “.NET” then search—then pick and download the 100MB (or so) .NET Framework SDK 1.1 package.

The SQL Server is a bit of a different matter. Apparently Microsoft (in all their wisdom) wishes to make it relatively difficult for *developers* to get a copy of their server—so they're selling it for \$49.99<sup>3</sup>: <http://www.microsoft.com/sql/howtobuy/development.asp>

There is a way around buying SQL Server: Use the school provided server. Another possible way around is to download the “Microsoft SQL Server 2000 Desktop Engine (MSDE 2000)”, which is really just SQL Server, except without any tools. (ie: like MySQL server without the useful ‘mysql’ program to interact with the database). There are many ‘Query’ programs online to use instead, like “SqlBuddy” (search sourceforge.net for it).

Next week we'll use Oracle—which is just a free download.

## 3 Architecture

The general architecture is that we'll have ‘value’ classes to pass around the data in our application. These are just simple classes with no functionality. In our application, that's `Contact` object located in `Contact.cs` file.

We will also have a database functionality class. It is responsible for all database interaction in our program. In our application, it is the `ContactDB` class in `ContactDB.cs` file.

The “DB” class interacts with the database by calling stored procedures. You can see the source code for them in `schema.sql` file.

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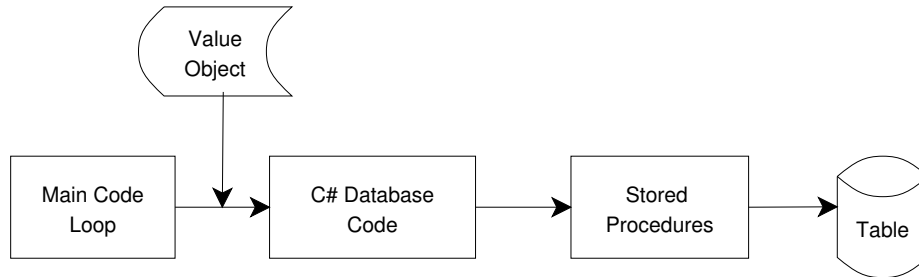
<sup>1</sup>The nature of .NET Frameworks, enables you to do exactly the same thing in VB.NET

<sup>2</sup>Note that .NET Framework SDK comes with Visual Studio.NET, so if you already have VS.NET, you don't need to separately download the SDK.

<sup>3</sup>It used to be \$499.99 before. Anyway, I'd like it to go on record that I find it rather disgusting that they're actually selling a developer edition—from now on I will stop promoting it as a database of choice for Windows. They clearly want to discourage *developers* from using it to develop applications. Oracle (with its *free* developer version) is now my choice for Windows applications.

The “Main.cs” file contains the main application code. This is the command line application that acts as a command line contacts book. It is just a loop, getting a command from a user, and running that command.

The flow of data looks sort of like that:



## 4 Setting up Database

We will discuss stored procedures a bit later in the course—for the time being, just assume that the ones in the `schema.sql` are working ‘ok’.

Now all that’s left is to run the `schema.sql` file against SQL Server. We do this by starting “Query Analyzer”, logging in as “su”, and then cutting and pasting the entire `schema.sql` file into the query window, and running it.

Note that if you’re using a school computer you won’t be able to login as “su”. What you should do is skip the entire section of `schema.sql` that deals with logins, and just use your own account. Also make sure to change `Main.exe.config` with correct database login and database name.

## 5 Compiling

To compile the project, you use the C# compiler that comes with .NET Framework SDK. You ensure that the `csc` compiler is in the path, and then run:

```
csc *.cs
```

Which will compile all `*.cs` files and create a file named `Main.exe`, which is the program executable.

## 6 Running Program

Once database is setup, and you have the executable, is it important to ensure that the right database login (and database name) are in the `Main.exe.config` file. Once everything is ‘ok’, you can just run: `Main`, and start using the contacts book.

To learn about possible commands, type “help”.