

## Exercise 4

### CRUD Operations

Prepared for Programming with Generative AI  
Mario Silic, PhD

#### 1. Objective

Understand CRUD operations with VB.Net.

CRUD operations are the four basic functions of persistent storage in databases and software systems. CRUD stands for:

1. **Create:** Adding new data to a database (e.g., adding a new student record).
2. **Read:** Retrieving or viewing existing data (e.g., displaying a list of students).
3. **Update:** Modifying existing data (e.g., changing a student's email address).
4. **Delete:** Removing data from the database (e.g., deleting a student record).

These operations are essential for managing and interacting with data in applications.

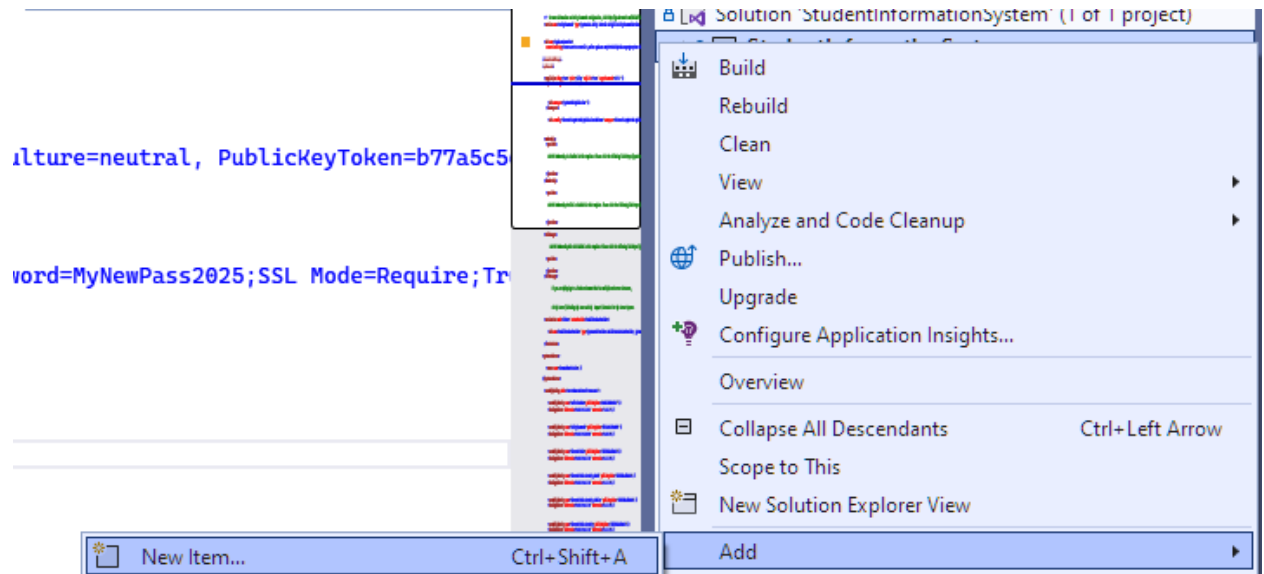
#### 2. CRUD

We want now to leverage our application and introduce CRUD operations.

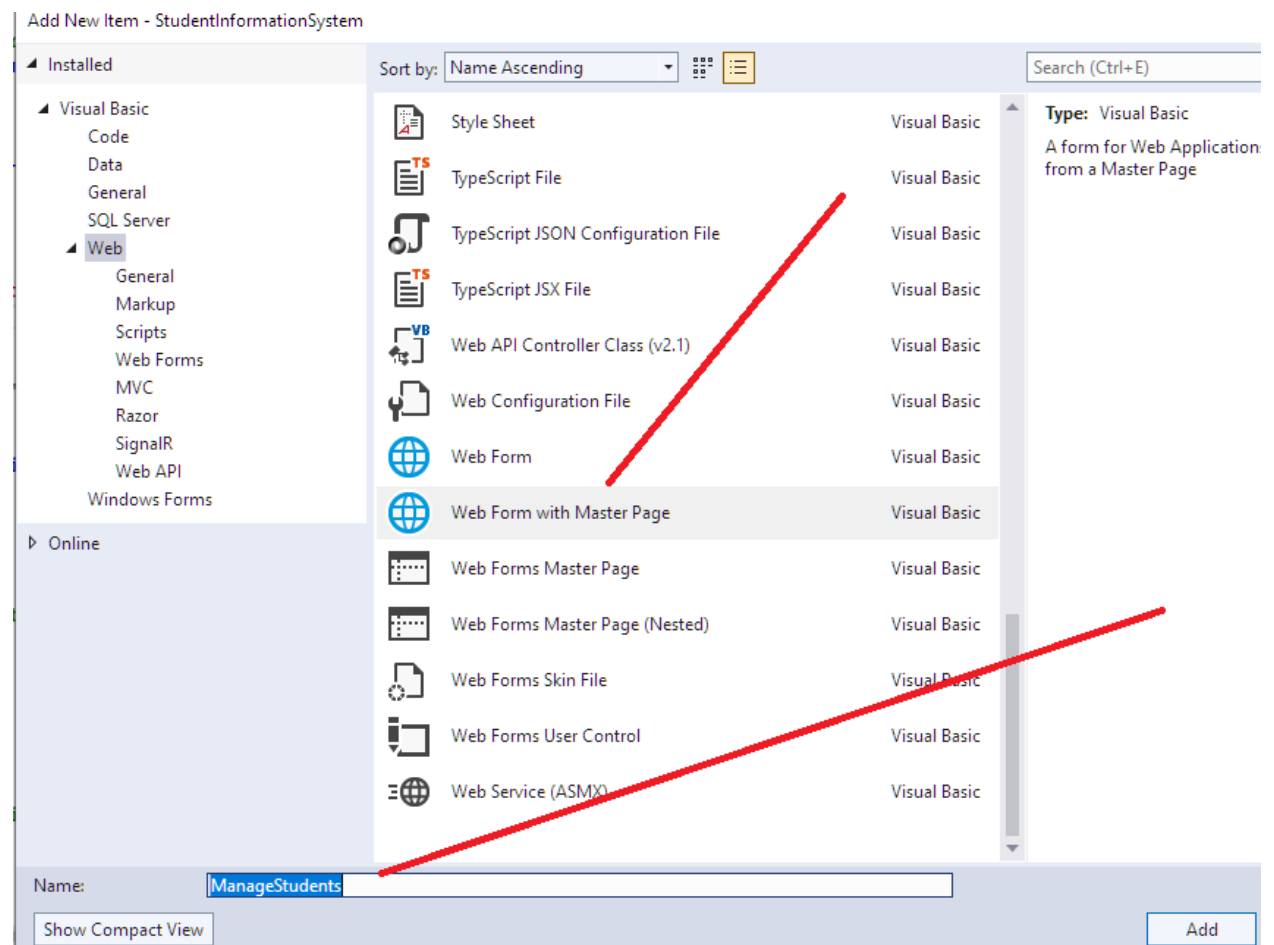
To do that, we will create a new webpagd in ourwebsite that you can call **ManageStudents.aspx**

How?

Right click on your project “StudentInformationSystem”. Below screen will appear – select New item

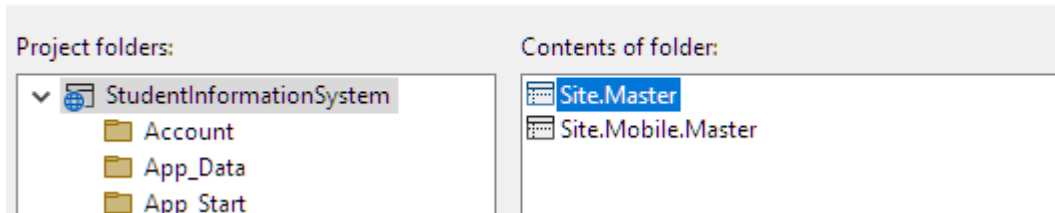


Select Web Form with Master Page and Name it ManageStudents as it is on the screen. Finally, click on Add.

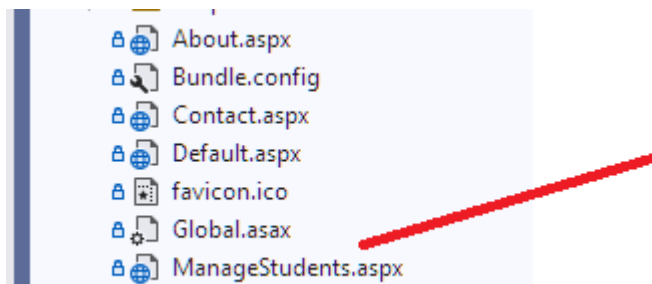


Select Site.Master as your master page.

Select a Master Page



New empty page will be created – if you click on it, you will see all is empty.



#### 💡 Ask Generative AI:

- *Example of a possible prompt*

*"I'm using VB.net webforms and I'm connected to supabase. Can you provide me full CUD operations backend and frontend code to manage my students table. I already have master page"*

In my case the backend code looks like this (Gen AI provided):

```

1 Imports Npgsql
2 Public Class ManageStudents
3     Inherits System.Web.UI.Page
4
5     Protected Sub Page_Load(ByVal sender As Object, ByVal e As System.EventArgs) Handles Me.Load
6
7     End Sub
8
9     Public Sub CreateStudent(name As String, age As Integer, email As String)
10        Dim connectionString As String = ConfigurationManager.ConnectionStrings("SupabaseConnection").ConnectionString
11        Using conn As New NpgsqlConnection(connectionString)
12            conn.Open()
13            Dim query As String = "INSERT INTO students (name, age, email) VALUES (@name, @age, @email);"
14            Using cmd As New NpgsqlCommand(query, conn)
15                cmd.Parameters.AddWithValue("@name", name)
16                cmd.Parameters.AddWithValue("@age", age)
17                cmd.Parameters.AddWithValue("@email", email)
18                cmd.ExecuteNonQuery()
19            End Using
20        End Using
21    End Sub
22
23    Public Sub UpdateStudent(id As Integer, name As String, age As Integer, email As String)
24        Dim connectionString As String = ConfigurationManager.ConnectionStrings("SupabaseConnection").ConnectionString
25        Using conn As New NpgsqlConnection(connectionString)
26            conn.Open()
27            Dim query As String = "UPDATE students SET name = @name, age = @age, email = @email WHERE id = @id;"
28            Using cmd As New NpgsqlCommand(query, conn)
29                cmd.Parameters.AddWithValue("@id", id)
30                cmd.Parameters.AddWithValue("@name", name)
31                cmd.Parameters.AddWithValue("@age", age)
32                cmd.Parameters.AddWithValue("@email", email)
33                cmd.ExecuteNonQuery()
34            End Using
35        End Using
36    End Sub
37
38    Public Sub DeleteStudent(id As Integer)
39        Dim connectionString As String = ConfigurationManager.ConnectionStrings("SupabaseConnection").ConnectionString
40
41    End Sub

```

Now you may get an error like I did – below one which basically says that the column name does not exist in your table students in supabase...

And of course, it does not exist as it is not name but first\_name...same goes for id, it is student\_id..

There are two ways to fix this. Either you provide to GenAI the structure of your table and it will correct it all OR you fix it manually...as we are lazy let's provide it with the structure and ask it to update the code.

```

End Sub
4 references
Private Sub LoadStudents()
    Using conn As New NpgsqlConnection(connectionString)
        conn.Open()
        Dim query As String = "SELECT id, name, age, email FROM students ORDER BY id;"
        Using cmd As New NpgsqlCommand(query, conn)
            Using reader As NpgsqlDataReader = cmd.ExecuteReader()
                Dim dt As New DataTable()
                dt.Load(reader)
                GridView1.DataSource = dt
                GridView1.DataBind()
            End Using
        End Using
    End Using
End Sub
0 references
Protected Sub btnCreate_Click(sender As Object, e As EventArgs)
    Using conn As New NpgsqlConnection(connectionString)
        conn.Open()
        Dim query As String = "INSERT INTO students (name, age, email) VALUES (@name, @age, @email);"
        Using cmd As New NpgsqlCommand(query, conn)
            cmd.Parameters.AddWithValue("@name", name)
            cmd.Parameters.AddWithValue("@age", age)
            cmd.Parameters.AddWithValue("@email", email)
            cmd.ExecuteNonQuery()
        End Using
    End Using
End Sub

```

Exception User-Unhandled

**Npgsql.PostgresException:** '42703: column "name" does not exist'

[Show Call Stack](#) | [View Details](#) | [Copy Details](#) | [Start Live Share session](#)

▲ Exception Settings

☐ Break when this exception type is thrown

☒ Break when this exception type is user-unhandled

Except when thrown from:

☐ StudentInformationSystem.dll

[Open Exception Settings](#) | [Edit Conditions](#)

This is what I sent to GenAI



but my students table has the following columns  
id, first\_name, last\_name, email and enrollment\_date

And immediately all the code was adapted with the new columns...just replace it.

ADVICE !

If you get any error, just GenAI again copy pasting entire error and it will correct what needs to be corrected.

Server Error in '/' Application.

Compilation Error

Description: An error occurred during the compilation of a resource required to service this request. Please review the following specific error details and modify your source code appropriately.

Compiler Error Message: BC30456: 'btnClear\_Click' is not a member of 'managestudents\_aspx'.

Source Error:

```
Line 31:             <asp:Button ID="btnUpdate" runat="server" Text="Update Student" CssClass="btn btn-warning" OnClick="btnUpdate_Click"/>
Line 32:             <asp:Button ID="btnDelete" runat="server" Text="Delete Student" CssClass="btn btn-danger" OnClick="btnDelete_Click"/>
Line 33:             <asp:Button ID="btnClear" runat="server" Text="Clear Fields" CssClass="btn btn-secondary" OnClick="btnClear_Click"/>
Line 34:         </div>
Line 35:     </div>
```

Source File: C:\Users\Mario\source\repos\StudentInformationSystem\StudentInformationSystem\ManageStudents.aspx Line: 33

[Show Detailed Compiler Output:](#)

[Show Complete Compilation Source:](#)

Now if all went fine you should get something similar to this

Manage Students

First Name:

Last Name:

Email:

Enrollment Date:

Add Student

Update Student

Delete Student

Clear Fields

ID	First Name	Last Name	Email	Enrollment Date	
1	Mario	Silic	mariosilic@gmail.com	19/02/2025 00:00:00	Select
2	John	Doe	john.doe@example.com	01/09/2023 00:00:00	Select
3	Jane	Smith	jane.smith@example.com	05/09/2023 00:00:00	Select
4	Michael	Johnson	michael.johnson@example.com	10/09/2023 00:00:00	Select
5	Emily	Davis	emily.davis@example.com	15/09/2023 00:00:00	Select

123

If you just click on Add student you may get an error message

#### Server Error in '/' Application.

*String was not recognized as a valid DateTime.*

Description: An unhandled exception occurred during the execution of the current web request. Please review the stack trace for more information about the error and where it originated in the code.

Exception Details: System.FormatException: String was not recognized as a valid DateTime.

Source Error:

```
Line 39:         cmd.Parameters.AddWithValue("@last_name", txtLastName.Text)
Line 40:         cmd.Parameters.AddWithValue("@email", txtEmail.Text)
Line 41:         cmd.Parameters.AddWithValue("@enrollment_date", DateTime.Parse(txtEnrollmentDate.Text))
Line 42:         cmd.ExecuteNonQuery()
Line 43:     End Using
```

Source File: C:\Users\Mario\source\repos\StudentInformationSystem\StudentInformationSystem\ManageStudents.aspx.vb Line: 41

Stack Trace:

```
[FormatException: String was not recognized as a valid DateTime.]
System.DateTime.Parse.Parse(String s, DateTimeFormatInfo dtfi, DateTimeStyles styles) +6394719
StudentInformationSystem.ManageStudents.btnAdd_Click(Object sender, EventArgs e) in C:\Users\Mario\source\repos\StudentInformationSystem\StudentInformationSystem\ManageStudents.aspx.vb:41
System.Web.UI.WebControls.Button.OnClick(EventArgs e) +138
System.Web.UI.WebControls.Button.RaisePostBackEvent(String eventArgument) +150
System.Web.UI.Page.ProcessRequestMain(Boolean includeStagesBeforeAsyncPoint, Boolean includeStagesAfterAsyncPoint) +5440
```

Why? This is because your code IS NOT controlling for any missing data in your input...



#### Ask Generative AI:

*You should ask GenAI how to improve error handling, missing data, etc.*



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## TASKS

Now our code already looks promising...BUT...you want to

- Add some message box asking the user before deletion or insertion whether he/she is sure about that action
- Display some message that an action was done: update or delete or insert
- Assign to enrollment date a default today's date
- Change your master page from

SIS Home About Contact

Register Log in

To something like

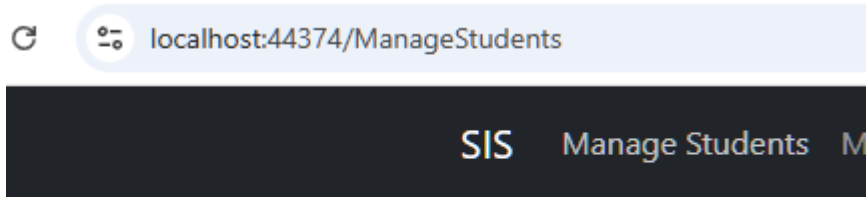
SIS Manage Students Manage Courses Manage Enrollments

Register Log in

- Assign your newly created page to Manage Students so when someone clicks on Manage Students it will be directed to ManageStudents.aspx

Ex:

```
<li class="nav-item"><a class="nav-link" runat="server"
href="~/ManageStudents.aspx">Manage Students</a></li>
```



TASK: Create more descriptive Default web page

💡 **Ask Generative AI:**

*Ask GenAI to create a very simple 1<sup>st</sup> front page for default.aspx where you want simply to have some nice visual “Student Information System” and maybe some background photo of students (don’t forget to precise that you already have master page and this is for default.aspx)*

This is what I got.

