

# C#and.Netframework

**1. Design and implement a Student Registration form using C# and WindowsForms. The form should allow users to input and save student details into a database.**

## AIM:

To design and implement a Student Registration Form using C# and Windows Forms, allowing users to input student details and save them to a database.

## PROCEDURE:

- **Design the Form:** Create a Windows Forms application in Visual Studio and design a form with input fields for Name, Age, Gender, Email, and Contact, along with a Save button.
- **Setup Database:** Create a SQL Server database called StudentDB with a table Student to store the student details.
- **Implement Database Connection:** Use ADO.NET to connect to the StudentDB database.
- **Save Button Functionality:** Add code to the Save button's click event to insert student details into the Student table in the database.
- **Run the Application:** Test the form by entering details and checking the database to ensure the data is saved correctly.

## PROGRAM:

### Database Setup:

```
CREATEDATABASE StudentDB;
```

```
USE StudentDB;
```

```
CREATE TABLE Students (  
    StudentID INT PRIMARY KEY IDENTITY, Name NVARCHAR(50),  
    Age INT, Gender NVARCHAR(10), Email NVARCHAR(50),  
    Contact NVARCHAR(15)  
);
```

## C#Code:

1. **FormDesign** (Add fieldsforName,Age,Gender,Email,andContactinWindowsFormsDesigner).
2. **CodeforStudent Registration Form:**

```
using System;
using
System.Data.SqlClient;using
System.Windows.Forms;

namespace StudentRegistrationApp
{
    public partial class StudentRegistrationForm : Form
    {
        public StudentRegistrationForm()
        {
            InitializeComponent();

            string connectionString = "DataSource=YourServerName;InitialCatalog=StudentDB;IntegratedSecurity=True";

            private void btnSave_Click(object sender, EventArgs)
            {
                string name = txtName.Text;
                int age = int.Parse(txtAge.Text);
                string gender = comboGender.SelectedItem.ToString();
                string email = txtEmail.Text;
                string contact = txtContact.Text;
                using (SqlConnection conn = new SqlConnection(connectionString))
                {
                    string query = "INSERT INTO Students (Name, Age, Gender, Email, Contact) VALUES (@Name, @Age, @Gender, @Email, @Contact)";
                    SqlCommand cmd = new SqlCommand(query, conn);
                    cmd.Parameters.AddWithValue("@Name", name);
                    cmd.Parameters.AddWithValue("@Age", age);
                    cmd.Parameters.AddWithValue("@Gender", gender);
                    cmd.Parameters.AddWithValue("@Email", email);
                    cmd.Parameters.AddWithValue("@Contact", contact);
                    conn.Open();
                    int result = cmd.ExecuteNonQuery();

                    if (result > 0)
                    {
                        MessageBox.Show("Student registered successfully.");
                    }
                    else
                    {
                        MessageBox.Show("Failed to register student.");
                    }
                }
            }
        }
    }
}
```

**INPUT:**

- **Name:**JohnDoe
- **Age:**21
- **Gender:**Male
- **Email:** johndoe@example.com
- **Contact:**1234567890

**OUTPUT:**

**FormOutput(onSuccessfulSubmission)**

**1. UserInputForm**

TheformwouldlooklikethisinWindowsForms:

Student  
RegistrationForm

Name:JohnDoeA  
ge21  
Gender:Male  
Email :  
johndoe@example.comContac  
t:1234567890

SaveButton

**2. ConfirmationMessage**Afterclickingthe**Save**button,

theformdisplaysthismessage:MessageBox:

"Studentregisteredsuccessfully."

**Database Output:**

**Query:**SELECT\* FROMStudents;

**SQLTableOutput:**

StudentId	Name	Age	Gender	Email	Contact
1	JohnDoe	21	Gender	johndoe@example.co m	123456789 0

**2. Design and implement a Student Fee Payment System using C# and Windows Forms. The application should allow students to enter their details, pay their fees, and generate a bill with a unique bill number.**

### **AIM:**

To design and implement a Student Fee Payment System using C# and Windows Forms, allowing students to enter their details, pay their fees, and generate a bill with a unique bill number.

### **PROCEDURE:**

- **Create a Windows Forms Application:** Open Visual Studio, create a new Windows Forms Application project for the Student Fee Payment System.
- **Design the Form:** Add controls for student details (Student ID, Name, Course), fee amount, and payment method. Include buttons for **Pay** and **Generate Bill**.
- **Setup Database:** Create a SQL Server database called Student Fees DB with tables for Students and Payments to store student details and payment records.
- **Database Connection:** Use ADO.NET to establish a connection to the Student Fees DB database.
- **Test the Application:** Run the application to ensure data is correctly entered, saved, and a bill is generated with a unique bill number.

### **PROGRAM:**

```
--Create the database
CREATEDATABASE StudentFeesDB;USE
StudentFeesDB;

-- Create the Students
table CREATETABLE Students(
    StudentID INT PRIMARY KEY, Name NVARCHAR(50),
    Course NVARCHAR(50)
);

-- Create the Payments
table CREATETABLE Payments(
    PaymentID INT PRIMARY KEY IDENTITY,
    StudentID INT FOREIGN KEY REFERENCES Students(StudentID), Amount DECIMAL(10,2),
    PaymentDate DATETIME,
    BillNumber UNIQUEIDENTIFIER DEFAULT NEWID()
);
```

## C#Code:

1. **Form Design:**Add TextBoxes for Student ID, Name, and Course, a Fee Amount field, and buttons for **Pay** and **Generate Bill**.
2. **Code for Fee Payment**

```
SystemForm:using System;

using

System.Data.SqlClient;using

System.Windows.Forms;

namespace StudentFeePaymentApp
{

    public partial class FeePaymentForm: Form
    {

        public FeePaymentForm(

        ){InitializeComponent(

        );

        }

        string connectionString="DataSource=YourServerName;InitialCatalog=StudentFeesDB;IntegratedSecurity=True";

        private void btnPay_Click(object sender, EventArgs){

            int studentID=int.Parse(txtStudentID.Text);

            string name =

            txtName.Text;string course=txtCourse.Text;

            decimal amount=decimal.Parse(txtAmount.Text);DateTime paymentDate = DateTime.Now;

            using(SqlConnection conn=new SqlConnection(connectionString)){conn.Open();
```

```
stringinsertStudent="IFNOTEXISTS(SELECT*FROMStudentsWHEREStudentID  
=@StudentID)" +
```

```
"INSERTINTOStudents(StudentID,Name,Course)VALUES(@  
StudentID,@Name,@Course)";
```

```

        SqlCommand cmdStudent
        =new SqlCommand(insertStudent,conn);cmdStudent.Parameters
        s.AddWithValue("@StudentID",
        studentID);cmdStudent.Parameters.AddWithValue("@Name",na
        me);cmdStudent.Parameters.AddWithValue("@Course",course)
        ;cmdStudent.ExecuteNonQuery();

        string
        insertPayment="INSERTINTOPayments(StudentID,Amount,PaymentDate)V
        ALUES(@StudentID,@Amount,@PaymentDate);" +

        "SELECTSCOPE_IDENTITY()";

        SqlCommand cmdPayment = new SqlCommand(insertPayment,
        conn);cmdPayment.Parameters.AddWithValue("@StudentID",studentID
        );cmdPayment.Parameters.AddWithValue("@Amount",amount);cmdPa
        yment.Parameters.AddWithValue("@PaymentDate",paymentDate);intpa
        ymentID=Convert.ToInt32(cmdPayment.ExecuteScalar());MessageBox.
        Show("Paymentsuccessful.Billnumberwillbegenerated.");

        stringgetBillNumber="SELECTBillNumberFROMPaymentsWHEREPaymentID
        =@PaymentID";

        SqlCommandcmdBill=newSqlCommand(getBillNumber,conn);c
        mdBill.Parameters.AddWithValue("@PaymentID",
        paymentID);Guid billNumber= (Guid)cmdBill.ExecuteScalar();

        MessageBox.Show($"BillGeneratedSuccessfully!\n\nBillNumber:
        {billNumber}\nStudentID:{studentID}\nName:{name}\nCourse:{course}\nAmount Paid:
        {amount:C}\nDate:{paymentDate}");
    }

}

}

}

```

**INPUT:**

- **StudentID:**1001
- **Name:**JohnDoe
- **Course:**ComputerScience
- **FeeAmount:**500.00

**OUTPUT:**

**1. FormLayout:**

Student FeePaymentForm
StudentID:1001Name :JohnDoe Course : ComputerSciencePayment : 500.00
PayButton

**2. ConfirmationMessage:**

MessageBox:

"Paymentsuccessful.Billnumberwillbegenerated."

**3. BillDisplay:**

MessageBox:

BillGeneratedSuccessfully!

Bill Number: 8a5d9c2e-2c43..  
.Student ID :1001  
Name :JohnDoe  
Course :  
ComputerScienceAmountPaid:  
\$500.00  
Date :[PaymentDate]



3. **Design and implement a Web Service using C# and ASP.NET to expose functionality for client applications to consume. The web services should provide a specific set of operations, such as retrieving data or performing a calculation.**

#### AIM:

To design and implement a Web Service using C# and ASP.NET that exposes specific functionality for client applications to consume, such as retrieving data or performing calculations.

#### PROCEDURE:

- **Create an ASP.NET Web Service Project:**  
Open Visual Studio, create a new ASP.NET Web Application project, and select the Web API template.
- **Define the Web Service Operations:** Decide on a set of operations. For example, we'll create an operation that retrieves student data and calculates the average grade.
- **Implement Web Service Methods:**
  - Define a method to retrieve a list of students.
  - Define a method to calculate the average grade of a student.
- **Create a Data Model:** Define models for Student and Grade.
- **Test the Web Service:** Use tools like Postman or Swagger to test the Web API endpoints and verify that data is returned correctly.

#### PROGRAM:

1. **Project Structure:** Create an ASP.NET Web API project with controllers and models.
2. **Models:** Define Student and Grade models.

```
namespace StudentWebService.Models
{
    public class Student
    {
        public int StudentID { get; set; }
        public string Name { get; set; }
        public List<int> Grades { get; set; }
    }
}
```

3. **Controller:** Create a StudentController to define the Web API endpoints.

```
using Microsoft.AspNetCore.Mvc;
using
StudentWebService.Models;
using
```

```
System.Collections.Generic;usi
ngSystem.Linq;
namespaceStudentWebService.Controllers
{
```

```

[ApiController][Route("api/[controller]")]
public class StudentController : ControllerBase
{
    private static readonly List<Student> students = new List<Student>
    {
        new Student { StudentID = 1, Name = "John Doe", Grades = new List<int> { 85, 90, 78 } },
        new Student { StudentID = 2, Name = "Jane Smith", Grades = new List<int> { 92, 88, 94 } }
    };

    [HttpGet]
    public ActionResult<IEnumerable<Student>> GetStudents()
    {
        return Ok(students);
    }

    [HttpGet("{id}/average")]
    public ActionResult<double> GetAverageGrade(int id)
    {
        var student = students.FirstOrDefault(s => s.StudentID == id);
        if (student == null)
        {
            return NotFound("Student not found");
        }
        double averageGrade = student.Grades.Average();
        return Ok(averageGrade);
    }
}

```

#### 4. **StartupConfiguration:** Configure the API services in `Startup.cs`.

```

using
Microsoft.AspNetCore.Builder;
using
Microsoft.AspNetCore.Hosting;
using
Microsoft.Extensions.DependencyInjection;
using
Microsoft.Extensions.Hosting;

namespace StudentWebService
{
    public class Startup
    {
        public void ConfigureServices(IServiceCollection services)
        {
            services.AddControllers();
        }
    }
}

```

```
public void Configure(IApplicationBuilder app, IWebHostEnvironment env)
{
    if (env.IsDevelopment())
    {
        app.UseDeveloperExceptionPage();
    }

    app.UseRouting();

    app.UseEndpoints(endpoints =>
    {
        endpoints.MapControllers();
    });
}
```

## INPUT:

### 1. GetAllStudents:

- o URL: `http://localhost:5000/api/student`
- o Method: GET

### 2. Get AverageGrade for a Student:

- o URL: `http://localhost:5000/api/student/1/average`
- o Method: GET

## OUTPUT:

### GetAllStudents:

- **Request:** GEThttp://localhost:5000/api/student
- **Response(JSON):**

```
[
  {
    "StudentID": 1,"Name":
    "JohnDoe",
    "Grades":[85, 90,78]
  },
  {
    "StudentID": 2,"Name":
    "JaneSmith",
    "Grades":[92, 88,94]
  }
]
```

### GetAverageGradefora Student:

- **Request:** GEThttp://localhost:5000/api/student/1/average
- **Response(JSON):**

```
{
  "averageGrade":
```

#### 4. Our college is organizing an Alumni

Meet on May 5, 2024. The alumni cell is in the process of creating a database to store a list of registered alumni who will attend the event. You are tasked with designing a registration form and implementing it using ADO.NET.

#### Requirements:

##### 1. Design the Registration Form:

- Create a Windows Forms application that includes the following controls:
  - **TextBox** for entering the **Alumni Name**
  - **TextBox** for entering the **Email**
  - **TextBox** for entering the **Phone Number**
  - **ComboBox** for selecting the **Department** (e.g., Computer Science, Business, Arts)
  - **Button** to **Register** alumni
  - **Button** to **Display** registered alumni
  - **DataGridView** control to display the list of registered alumni from the selected department

##### 2. Implement Functionality Using ADO.NET:

- **Register Button:**
  - When the **Register** button is clicked, validate the input fields.
  - If the inputs are valid, insert the entered details into the database using ADO.NET. Handle any database exceptions that may occur.
- **Display Button:**
  - When the **Display** button is clicked, retrieve all registered alumni for the selected department from the **ComboBox**.
  - Display the results in the **DataGridView** control.

#### AIM:

To design a Windows Forms application for alumni registration for the Alumni Meet and implement functionality to store and display registered alumni details using ADO.NET.

#### PROCEDURE:

1. **Create the Database:** Set up a SQL Server database named **AlumniDB** with an **Alumni** table containing columns for **AlumniID**, **Name**, **Email**, **Phone Number**, and **Department**.
2. **Design the Windows Form:**
  - Add text boxes for **Alumni Name**, **Email**, and **Phone Number**.
  - Add a **ComboBox** for selecting **Department**.
  - Add a **Register** button to save data, a **Display** button to show data, and a **DataGridView** to display registered alumni.
3. **Implement Register and Display Functionality Using ADO.NET:**
  - **Register Button:** Validate input fields and insert data into the **Alumni** table using an **ADO.NET SqlCommand**.
  - **Display Button:** Retrieve and display alumni data for the selected department in the **DataGridView** using an **ADO.NET SqlDataAdapter**.
4. **Test the Application:** Run the form to ensure alumni data is saved correctly in the database and displays in the **DataGridView**.

## PROGRAM:

### DatabaseSetup:

– Create the AlumniDB  
database  
CREATEDATABASEAlu  
mniDB;

USEAlumniDB;

– Create the Alumni  
table  
CREATETABLEAlum  
ni(  
AlumniIDINTPRIMARYKEYIDENTITY,Nam  
e NVARCHAR(50),  
EmailNVARCHAR(50),  
PhoneNumberNVARCHAR(15),  
DepartmentNVARCHAR(50)  
);

### **C#CodeforAlumniRegistrationForm:**

#### 1. DesigningtheForm:

oAddcontrolsfor**AlumniName,Email,PhoneNumber,Department**(ComboBox),  
**RegisterandDisplay**buttons,andaDataGridView.

#### 2. C#CodeforForm:

```
usingSystem;usin  
gSystem.Data;  
using  
System.Data.SqlClient;using  
System.Windows.Forms;  
namespaceAlumniRegistrationApp  
{  
    publicpartialclassAlumniForm:Form  
    {  
        privatestringconnectionString="DataSource=YourServerName;InitialCatalog=AlumniDB;I  
ntegratedSecurity=True";  
  
        publicAlumniForm()  
        {  
            InitializeComponent();LoadDepa  
rtments();  
        }  
        privatevoidLoadDepartments()  
        {  
            comboBoxDepartment.Items.AddRange(newstring[]{"ComputerScience","Business","A  
rts" });  
        }  
    }  
}
```

```

private void btnRegister_Click(object sender, EventArgs)
{
    string name =
    txtName.Text; string email =
    txtEmail.Text;
    string phoneNumber = txtPhoneNumber.Text;
    string department = comboBoxDepartment.SelectedItem?.ToString();

    if (string.IsNullOrEmpty(name) || string.IsNullOrEmpty(email)
        || string.IsNullOrEmpty(phoneNumber) || string.IsNullOrEmpty(department)
    )
    {
        MessageBox.Show("All fields are required.");
        return;
    }

    using (SqlConnection conn = new SqlConnection(connectionString))
    {
        try
        {
            conn.Open();
            string query = "INSERT INTO Alumni (Name, Email, Phone Number,
Department) VALUES (@Name, @Email, @Phone Number, @Department)";
            using (SqlCommand cmd = new SqlCommand(query, conn))
            {
                cmd.Parameters.AddWithValue("@Name", name); cmd.Parameters.AddWithValue("@Email", email); cmd.Parameters.AddWithValue("@Phone Number", phoneNumber); cmd.Parameters.AddWithValue("@Department", department); cmd.ExecuteNonQuery();
            }
            MessageBox.Show("Alumni registered successfully.");
        }
        catch (Exception ex)
        {
            MessageBox.Show($"Error: {ex.Message}");
        }
    }
}

private void btnDisplay_Click(object sender, EventArgs)
{
    string department = comboBoxDepartment.SelectedItem?.ToString(); if (string.IsNullOrEmpty(department))
    {
        MessageBox.Show("Please select a department.");
        return;
    }
    using (SqlConnection conn = new SqlConnection(connectionString))
    {
        try
        {
            conn.Open();

```



```
stringquery="SELECTAlumniID,Name,Email,PhoneNumber,Department
FROMAlumniWHEREDepartment= @Department";
using(SqlCommandcmd=newSqlCommand(query,conn))
{
    cmd.Parameters.AddWithValue("@Department",department);u
sing(SqlDataAdapteradapter=newSqlDataAdapter(cmd))
    {
        DataTabledt=newDataTable();adapt
er.Fill(dt);dataGridViewAlumni.Data
Source=dt;
    }
}
}
catch(Exceptionex)
{
    MessageBox.Show($"Error:{ex.Message}");
}
}
}
```

INPUT:

- **AlumniName:** JohnDoe
- **Email:** johndoe@example.com
- **PhoneNumber:** 1234567890
- **Department:**ComputerScience

DISPLAY:

FormLayout:

AluminiRegistrationForm
Name: JohnDoe Email:johndoe@example.co mPhone:1234567890 Department:ComputerScience(ComboBox)
[RegisterButton] [DisplayButton]
DataGridView(AlumniList)

**OUTPUT:**

**AfterRegistering Alumni:**

- MessageBox:

"Alumni registered successfully."

**DisplayingRegisteredAlumniForSelectedDepartment:**

- On clicking **Display** with "Computer Science" selected, the DataGridView displays all registered alumni in the Computer Science department:

DataGridView(AlumniList):

AlumniId	Name	Email	Phone	Dept
1	JohnDoe	johndoe@example.com	1234567890	CS

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