C# and .NET Frameworks Assignment

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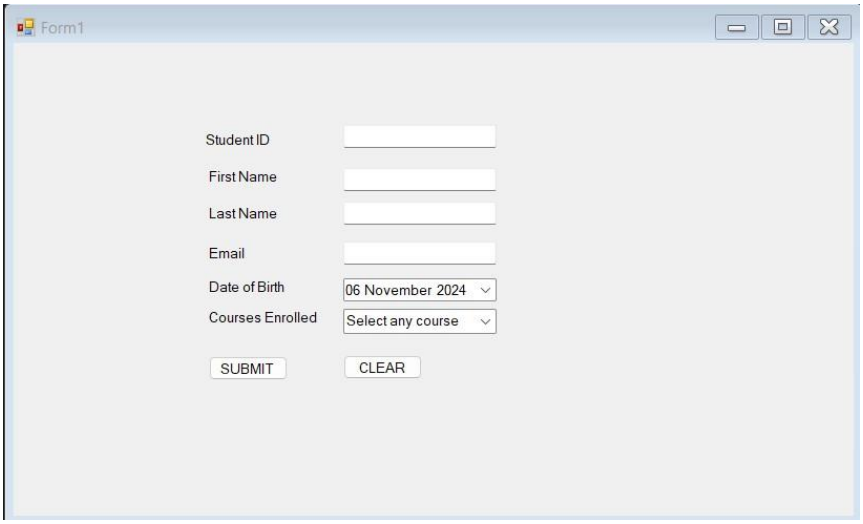
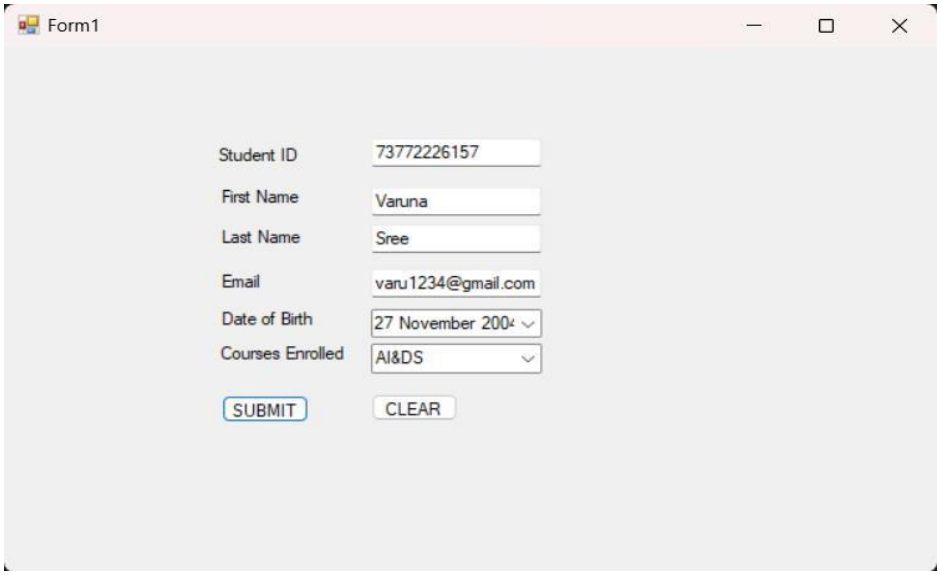
1. Design and implement a **Student Registration** form using C# and Windows Forms. The form should allow users to input and save student details into a database.

Requirements:

1. The registration form should include the following fields:
    - **Student ID** (Auto-generated or entered manually)
    - **First Name** ○ **Last Name**
    - **Date of Birth** ○ **Email** ○ **Phone Number** ○ **Course Enrolled**
2. Implement the following features:
    - **Form Validation**: Ensure that all required fields (e.g., Student ID, First Name, Last Name, Email) are properly validated (e.g., email format, required fields, etc.).
    - **Save Data**: Connect the form to a database (SQL Server, MySQL, or any other relational database of your choice) using ADO.NET to save the student data.
    - **Reset Form**: Provide a "Clear" button to reset all the input fields.
    - **Display Students**: Optionally, include a `DataGridView` control to display all registered students after submission.

FORM AND CODE:





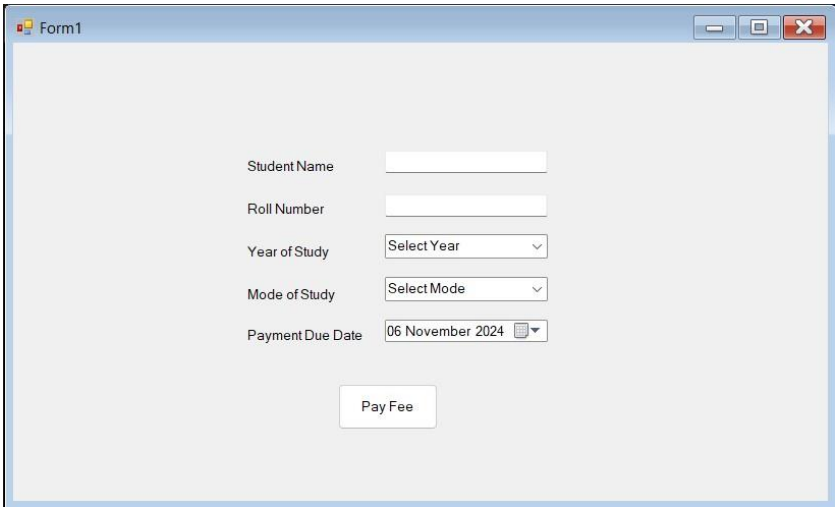

```
using System;
using System.Data.SqlClient;
using System.Windows.Forms;
public partial class StudentForm : Form
{
    public StudentForm()
    {
        InitializeComponent();
    }
    private void Form1_Load(object sender, EventArgs e)
    {
        LoadStudentData();
    }
    private void btnSubmit_Click(object sender, EventArgs e)
    {
        if (ValidateForm())
        {
            SaveStudentData();
            ClearForm();
            LoadStudentData();
        }
    }
    private bool ValidateForm()
    {
        if (string.IsNullOrEmpty(txtFirstName.Text) || string.IsNullOrEmpty(txtEmail.Text))
        {
            MessageBox.Show("First Name and Email are required.");
            return false;
        }
        return true;
    }
    private void SaveStudentData()
    {
        string connectionString = "your connection string";
        using (SqlConnection con = new SqlConnection(connectionString))
        {
            con.Open();
            string query = "INSERT INTO Students (FirstName, LastName, DateOfBirth, PhoneNumber, Email, CourseEnrolled) " +
                           "VALUES (@FirstName, @LastName, @DateOfBirth, @PhoneNumber, @Email, @CourseEnrolled)";
            using (SqlCommand cmd = new SqlCommand(query, con))
            {
                cmd.Parameters.AddWithValue("@FirstName", txtFirstName.Text);
                cmd.Parameters.AddWithValue("@LastName", txtLastName.Text);
                cmd.Parameters.AddWithValue("@DateOfBirth", dtpDateOfBirth.Value);
                cmd.Parameters.AddWithValue("@PhoneNumber", txtPhoneNumber.Text);
                cmd.Parameters.AddWithValue("@Email", txtEmail.Text);
                cmd.Parameters.AddWithValue("@CourseEnrolled", cabCourseEnrolled.SelectedItem.ToString());
                cmd.ExecuteNonQuery();
            }
        }
    }
    private void ClearForm()
    {
        txtFirstName.Clear();
        txtLastName.Clear();
        txtEmail.Clear();
        txtPhoneNumber.Clear();
        cabCourseEnrolled.SelectedIndex = -1;
        dtpDateOfBirth.Value = DateTime.Now;
    }

    private void LoadStudentData()
    {
        // Your logic to load student data into the DataGridView
    }
}
```

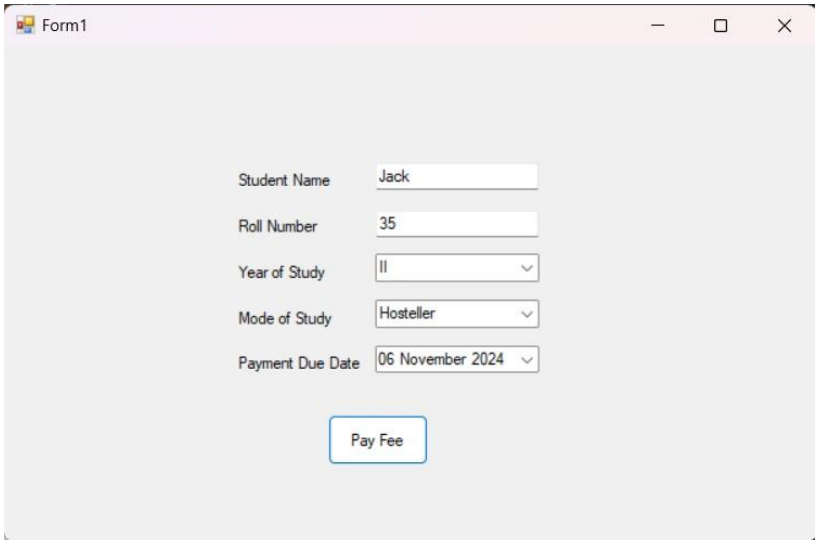
2. Design and implement a **Student Fee Payment System** using C# and Windows Forms. The application should allow students to enter their details, pay their fees, and generate a bill with a unique bill number.

Requirements:

1. **Form Design**:
    - The form should include the following fields:
        - **Student Name**
        - **Roll Number**
        - **Year of Study** (Dropdown or input field)
        - **Hostel/Day Scholar** (Radio buttons or dropdown selection)
        - **Due Date for Fee Payment** (Date Picker)
2. **Fee Payment and Bill Generation**:
    - When the student fills in the required details and clicks the "Pay Fee" button:
        - **Calculate the total fees** based on whether the student is a **Hostel Resident** or a **Day Scholar** (apply appropriate fees based on your assumption).
        - If the payment is made **after the due date**, apply a **late fee of Rs. 100 per day**.
        - Generate a **Bill** with a unique bill number, and display it along with the student's details (name, roll number, year of study, total fees, and any late fees applied).

FORM AND CODE:






```
using System;
using System.Windows.Forms;
public partial class FeePaymentForm : Form
{
    const decimal HostelFee = 50000;
    const decimal DayScholarFee = 30000;
    const decimal LateFeePerDay = 100;
    public FeePaymentForm()
    {
        InitializeComponent();
    }
    private void btnPayfee_Click(object sender, EventArgs e)
    {
        if (ValidateForm())
        {
            decimal totalFee = CalculateFee();
            string billNumber = GenerateBillNumber();
            DisplayBill(billNumber, totalFee);
        }
    }
    private bool ValidateForm()
    {
        if (string.IsNullOrEmpty(txtStudentName.Text) || string.IsNullOrEmpty(txtRollNumber.Text))
        {
            MessageBox.Show("Student Name and Roll Number are required.");
            return false;
        }
        return true;
    }
    private decimal CalculateFee()
    {
        decimal baseFee = 0;
        if (cmbHostelDayScholar.SelectedItem.ToString() == "Hostel Resident")
        {
            baseFee = HostelFee;
        }
        else
        {
            baseFee = DayScholarFee;
        }
        DateTime dueDate = dtpDueDate.Value;
        DateTime paymentDate = DateTime.Today;
        decimal lateFee = 0;
        if (paymentDate > dueDate)
        {
            int daysLate = (paymentDate - dueDate).Days;
            lateFee = daysLate * LateFeePerDay;
        }

        return baseFee + lateFee;
    }
    private string GenerateBillNumber()
    {
        return "BILL-" + DateTime.Now.ToString("yyyyMMddHHmmss") + "-" + txtRollNumber.Text;
    }
    private void DisplayBill(string billNumber, decimal totalFee)
    {
        lblBill.Text = $"Bill Number: {billNumber}\n" +
                       $"Student Name: {txtStudentName.Text}\n" +
                       $"Roll Number: {txtRollNumber.Text}\n" +
                       $"Year of Study: {cmbYearOfStudy.SelectedItem.ToString()}\n" +
                       $"Hostel/Day Scholar: {cmbHostelDayScholar.SelectedItem.ToString()}\n" +
                       $"Total Fees: {totalFee:C}";
    }
}

```

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

Implementation Steps:

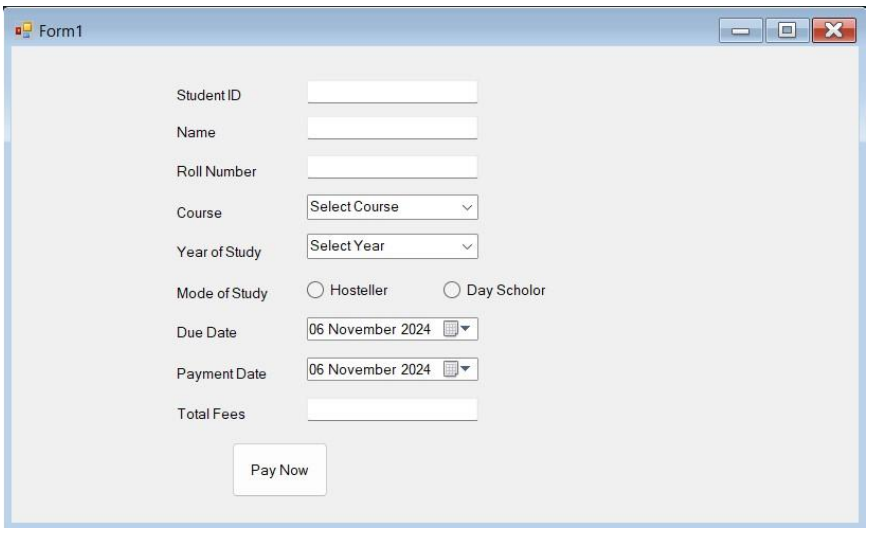
Define the Service Requirements:

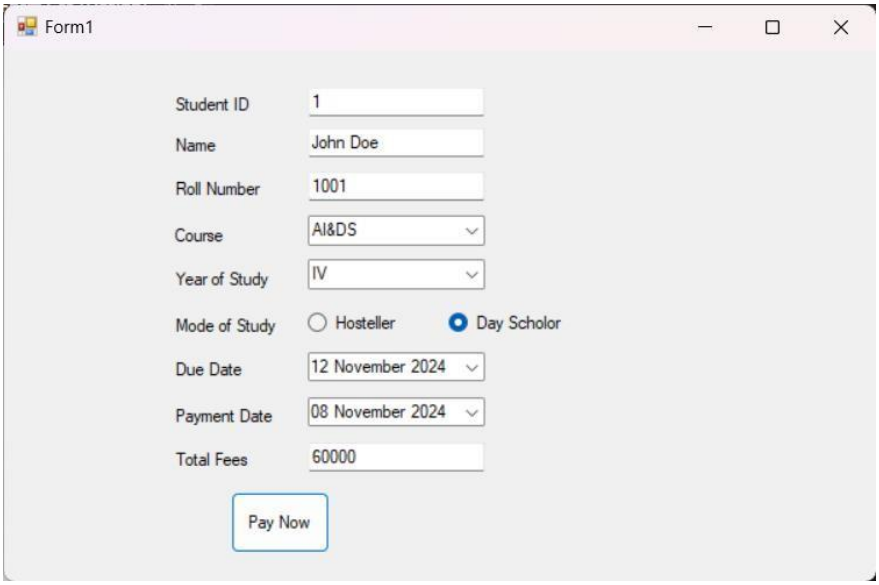
- Identify the functionality that the web service will provide (e.g., retrieving student information, performing fee calculations, etc.). ○ Specify the input parameters and return types for each operation that the web service will expose.

Create the Web Service:

- In Visual Studio, create a new **ASP.NET Web Service** project.
- Define a service class by inheriting from `System.Web.Services.WebService`.
- Decorate the class with the `[WebService]` attribute and each method with the `[WebMethod]` attribute to expose them as web service operations.
- Implement the required service methods (e.g., retrieving student data or calculating fees).

FORM AND CODE:





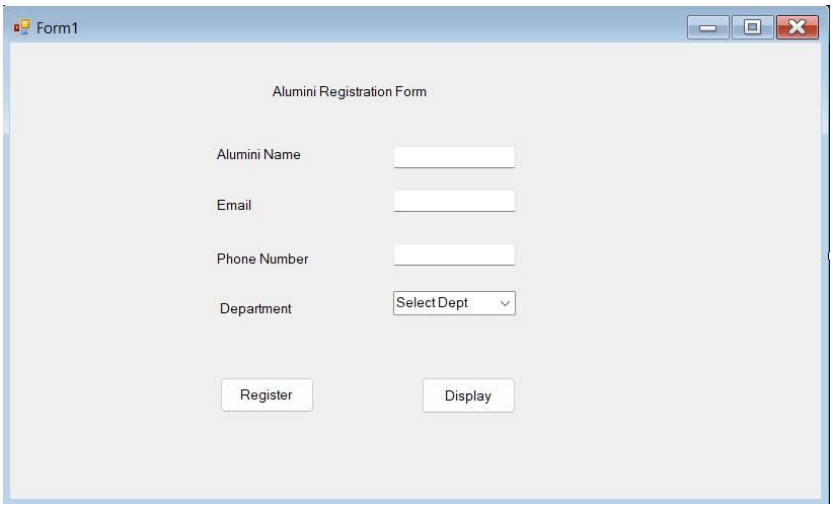

```
using System;
using System.Collections.Generic;
using System.Web.Services;
[WebService(Namespace = "http://yurdum.com")]
[WebServiceBinding(ConformsTo = WsiProfiles.BasicProfile1_1)]
public class StudentService : WebService
{
    // Dictionary to store student data
    private static readonly Dictionary<int, Student> students = new Dictionary<int, Student>
    {
        { 1001, new Student { StudentID = 1001, Name = "John Doe", RollNumber = "CS1001", Course = "Computer Science", YearOfStudy = 1 } },
        { 1002, new Student { StudentID = 1002, Name = "Jane Smith", RollNumber = "EE1002", Course = "Electrical Engineering", YearOfStudy = 3 } }
    };
    // Web method to get student details by student ID
    [WebMethod]
    public Student GetStudentDetails(int studentID)
    {
        if (students.ContainsKey(studentID))
        {
            return students[studentID];
        }
        else
        {
            return null; // Return null if student not found
        }
    }
    // Web method to calculate the total fees (including late fee if applicable)
    [WebMethod]
    public decimal CalculateFees(int studentID, bool isHostelResident, DateTime dueDate, DateTime paymentDate)
    {
        decimal baseFee = isHostelResident ? 75000 : 30000; // Hostel fee or Day Scholar fee

        decimal lateFee = 0;
        if (paymentDate > dueDate)
        {
            int daysLate = (paymentDate - dueDate).Days;
            lateFee = daysLate * 100; // 100 per day late fee
        }
        return baseFee + lateFee;
    }
}
// Student class to represent student data
public class Student
{
    public int StudentID { get; set; }
    public string Name { get; set; }
    public string RollNumber { get; set; }
    public string Course { get; set; }
    public int YearOfStudy { get; set; }
}

```

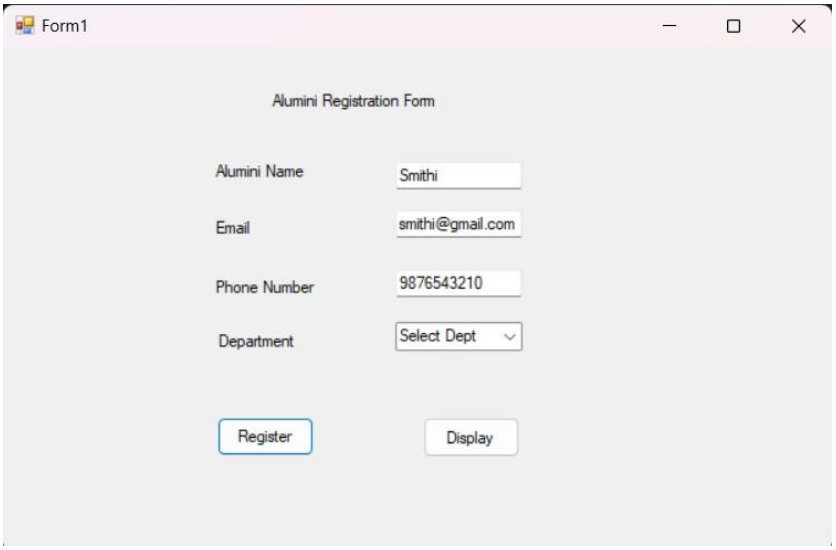
4. Our college is organizing an **Alumni Meet** on **May 5, 2024**. The alumni cell is in the process of creating a database to store a list of registered alumni who will attend the event. You are tasked with designing a registration form and implementing it using ADO.NET.

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.

FORM AND CODE:






```
using System;
using System.Data.SqlClient;
using System.Windows.Forms;
public partial class Form1 : Form
{
    // Connection string for SQL Server (update it with your actual database details)
    string connectionString = "Data Source=YourServer;Initial Catalog=YourDatabase;Integrated Security=True;";
    public Form1()
    {
        InitializeComponent();
    }
    // Event handler for Register button click
    private void btnRegister_Click(object sender, EventArgs e)
    {
        if (ValidateForm())
        {
            try
            {
                using (SqlConnection con = new SqlConnection(connectionString))
                {
                    con.Open();
                    string query = "INSERT INTO Alumni (AlumniName, Email, PhoneNumber, Department) " +
                                   "VALUES (@AlumniName, @Email, @PhoneNumber, @Department)";

                    SqlCommand cmd = new SqlCommand(query, con);
                    cmd.Parameters.AddWithValue("@AlumniName", txtAlumniName.Text);
                    cmd.Parameters.AddWithValue("@Email", txtEmail.Text);
                    cmd.Parameters.AddWithValue("@PhoneNumber", txtPhoneNumber.Text);
                    cmd.Parameters.AddWithValue("@Department", cmbDepartment.SelectedItem.ToString());

                    cmd.ExecuteNonQuery();

                    MessageBox.Show("Alumni registered successfully!");
                    ClearForm();
                }
            }
            catch (Exception ex)
            {
                MessageBox.Show("Error: " + ex.Message);
            }
        }
    }
    // Method to validate form inputs
    private bool ValidateForm()
    {
        if (string.IsNullOrEmpty(txtAlumniName.Text) ||
            string.IsNullOrEmpty(txtEmail.Text) ||
            string.IsNullOrEmpty(txtPhoneNumber.Text) ||
            cmbDepartment.SelectedItem == null)
        {
            MessageBox.Show("All fields are required!");
            return false;
        }
        return true;
    }
    // Method to clear the form after successful registration
    private void ClearForm()
    {
        txtAlumniName.Clear();
        txtEmail.Clear();
        txtPhoneNumber.Clear();
        cmbDepartment.SelectedIndex = -1; // Reset combo box
    }
}
```

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