REPUBLIC OF YEMEN
HADHRAMOUT UNIVERSITY
COLLEGE OF CS & IT

الجمهورية اليمنية
جامعة حضرموت
كلية الحاسبات وتقنية المعلومات

Smart Library

Name Students:

- Naif M. Alqubalee
- Basel Adel
- Mahphoud Alajem
- Omer Ahmed
- Ahmed Jaron

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2. Introduction

- The University Library Management App is designed to provide students with a simple way to access and download the university's book collection. This desktop application aims to enhance the student experience by making it easier to find and view books that related to their studies.

- Key Features
    - Simple User Interface: The app welcomes users with a main page that allows them to choose their role—either as a student or an admin. Each role has a specific experience designed to meet their specific needs.
    - Student Login: Students can log in using their university Name(optional). Once logged in, they are presented with a main page that features various filters such as level, department, teacher, and download options. These filters help students quickly find the books they need from database.
    - Admin Access: Administrators can log in using their Name(optional) and Password(required). After a successful login, admins have access to additional functionalities, including the ability to add or delete or update books from the database. This ensures that the library's resources are always up to date.
    - Book Management: The app provides dedicated forms for adding and update books. Admins can enter book details, such as the book name, link, teacher's name, and department, to upload new resources.

This application not only streamlines the process of finding and managing books but also fosters a more organized and efficient library system at the university. By integrating user-friendly forms and efficient filtering options, the app aims to enhance the educational experience for all users.

3. Requirements

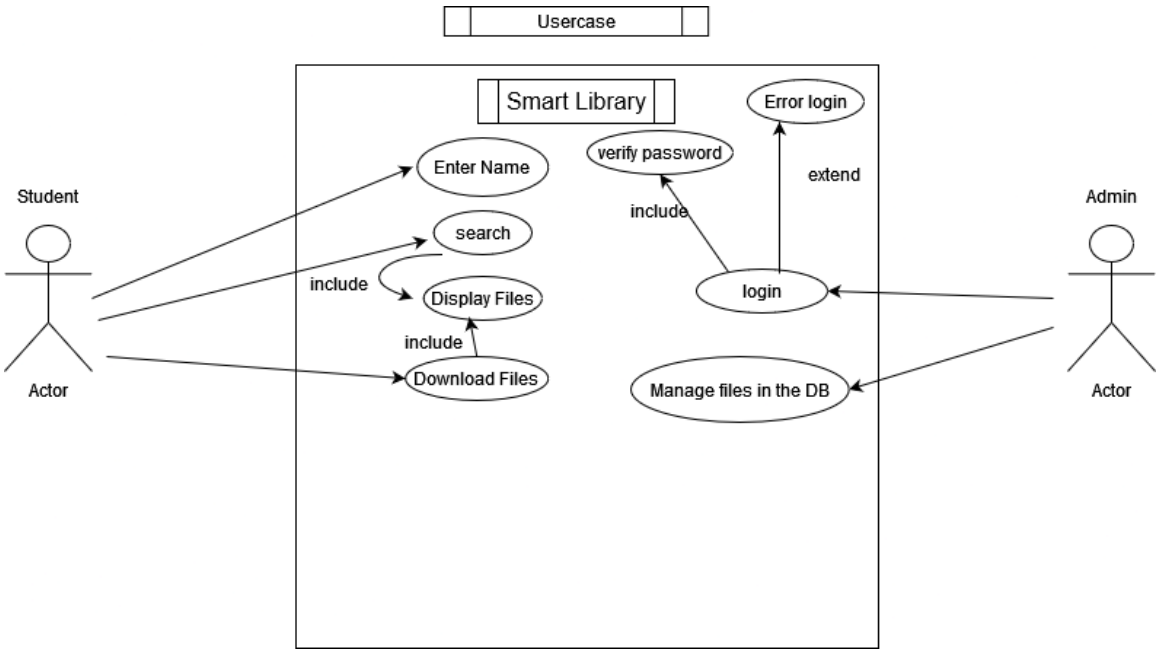
- The library project is an important step towards improving the learning experience at the university by identifying various external sources that help students during their studies at the college. Through functional and non-functional requirements, the project can provide an effective platform for students to access study materials easily.

- 3.1 Functional Requirements:

    1. Bring, delete or Update files: Ability to easily bring, delete or modify files to the system from the database.
    2. Upload files: This allows the admin to easily upload information about new files to the system so that they can be added to the database.
    3. File display interfaces: Provides convenient display interfaces to enable users and administrators to see the available files. These interfaces include details such as names, departments, etc.
    4. Ability to filtering files: Users and Admin should be able to filter files according to certain criteria such as teacher name, department, or level. This helps in facilitating quick and efficient access to the required files.
    5. Search Feature: Provides a search feature that allows users or Admin to enter keywords to quickly find files.

- 3.2 Non-Functional Requirements:

    1. Professional display interface design: User interfaces should be professionally designed, making it easy for users to interact with the system.
    2. Response: The system response must be fast, even when there are a large number of users at the same time.
    3. Speed: File upload and download speeds should be high to ensure that there are no delays that affect the user experience.



Use Case ID	Use Case Name	Actors	Description	Preconditions	Postconditions
UC1	Student Login	Student	Allows students to log in using their credentials to access library features such as filtering and downloads.	The student must have valid credentials. The system must be connected to the student database.	The student is logged in and redirected to their main page.
UC2	Admin Login	Admin	Enables administrators to log in to manage library resources.	The admin must have a valid username and password.	The admin is logged in and redirected to the admin dashboard.

Use Case ID	Use Case Name	Actors	Description	Preconditions	Postconditions
UC3	View Book List	Student, Admin	Displays a list of available books, with options to filter based on criteria like level, department, or teacher.	The user must be logged in.	The user sees a filtered list of books based on selected criteria.
UC4	Search Books	Student, Admin	Allows users to search for books using keywords.	The user must be logged in.	The user sees a list of books matching the search criteria.
UC5	Upload Book	Admin	Enables the admin to upload details of new books, such as name, link, teacher, and department.	The admin must be logged in. Valid book details must be provided.	The new book details are stored in the database and visible to users.
UC6	Update Book Details	Admin	Allows the admin to modify existing book details, including name, link, teacher, and department.	The admin must be logged in. The book must exist in the database.	The updated book details are saved and reflected in the system.
UC7	Delete Book	Admin	Allows the admin to delete a book from the library.	The admin must be logged in. The book must exist	The selected book is removed from the database.

Use Case ID	Use Case Name	Actors	Description	Preconditions	Postconditions
UC8	Filter Books	Student, Admin	Provides options to filter books by department, level, or teacher for easy access.	The user must be logged in.	The user sees a filtered list of books based on the selected criteria.
UC9	View User Profile	Student, Admin	Allows users to view their profile details, such as name and access level.	The user must be logged in.	The user sees their profile information.
UC10	Log Out	Student, Admin	Ends the user session and logs them out of the system.	The user must be logged in.	The user is logged out, and the session is terminated.

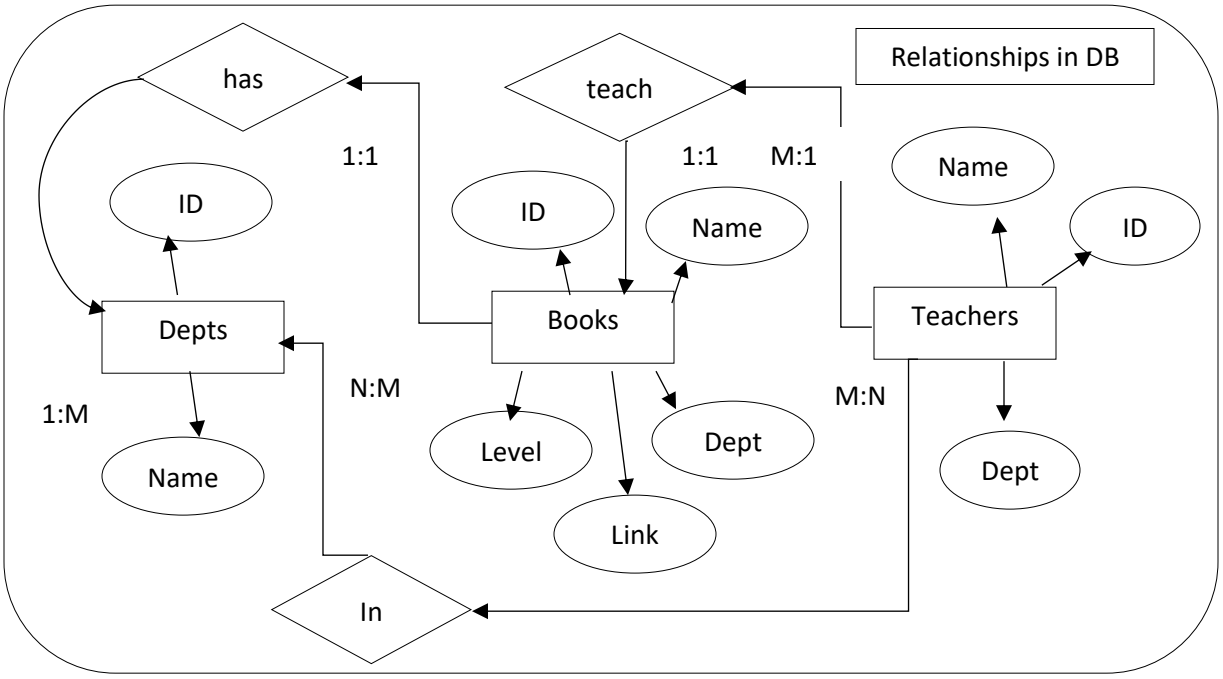


Figure ERD

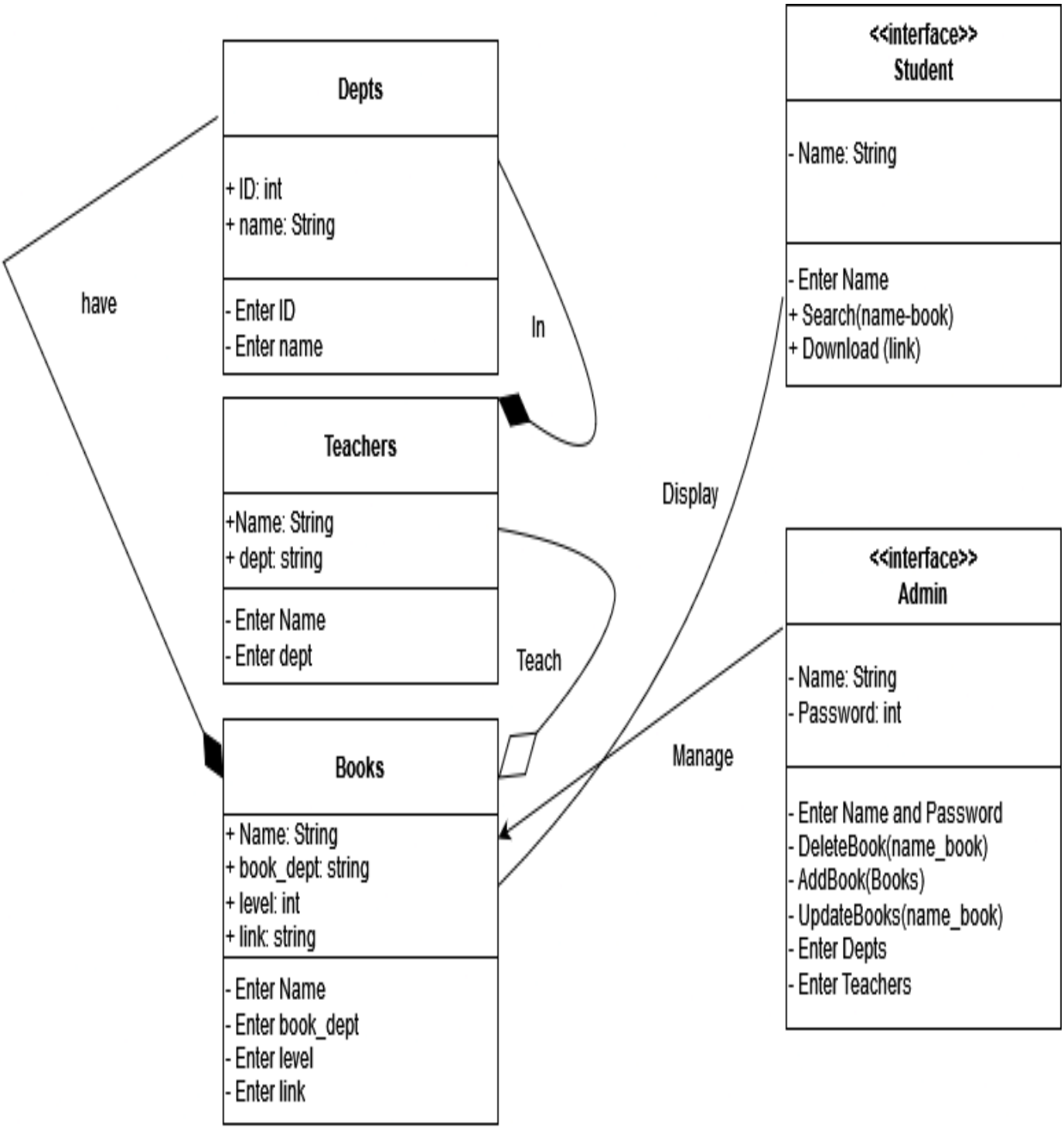
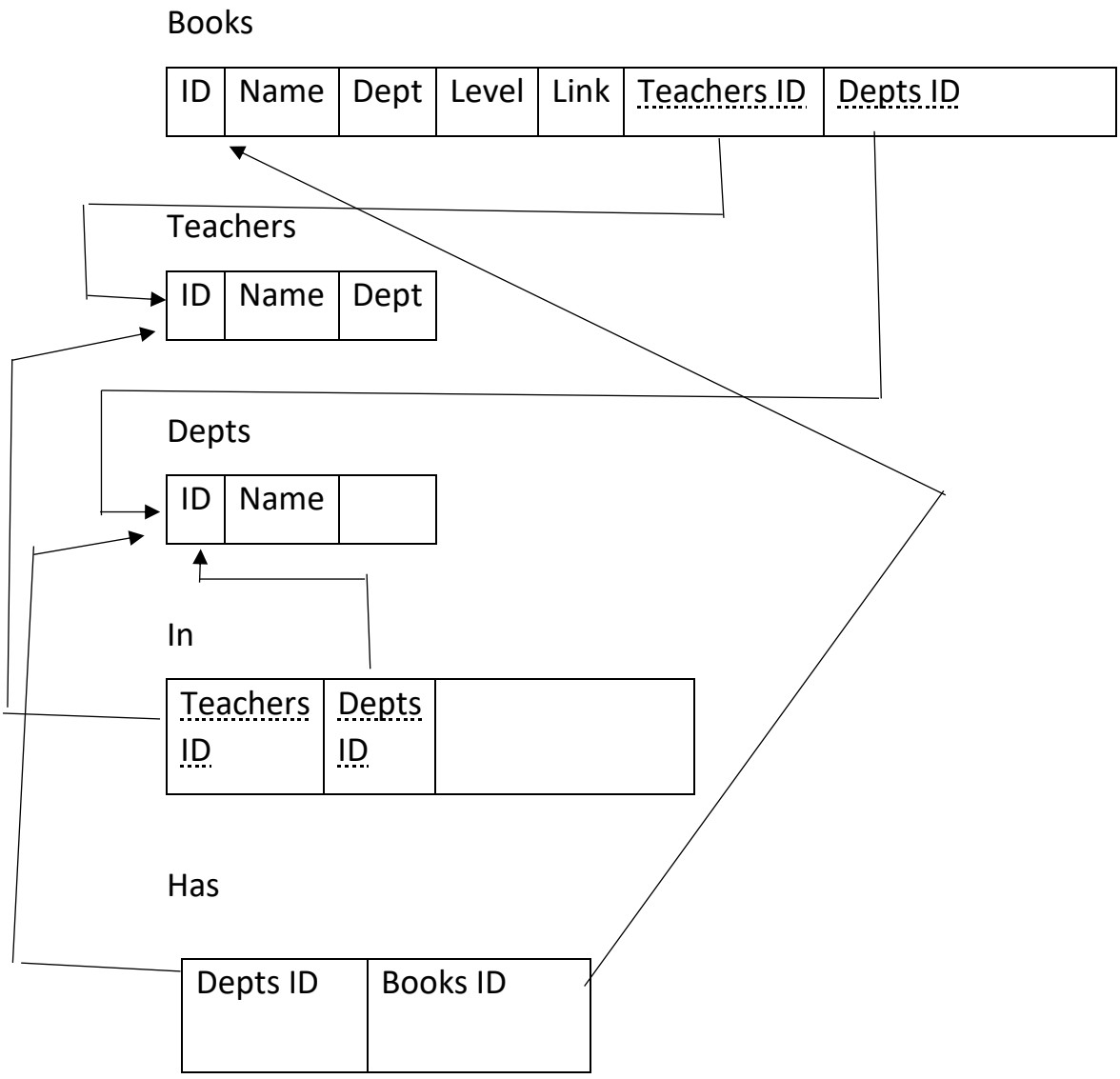


Figure Class Diagram



Schema From ERD

Project Code:

Figure Form 1

```
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;

namespace Smart_Library
{
    public partial class first_form : Form
    {
        public first_form()
        {
            InitializeComponent();
        }

        private void btnAdmins_Click(object sender, EventArgs e)
        {
            secondForm sAdminForm = new secondForm();
            sAdminForm.Show();
            this.Hide();
        }
```

```
        private void btnStudents_Click(object sender, EventArgs e)
        {
            second_pass_form_for_students sStudentForm = new
second_pass_form_for_students();
            sStudentForm.Show();
            this.Hide();
        }

        private void guna2HtmlLabel1_Click(object sender, EventArgs e)
        {

        }
    }
}
```

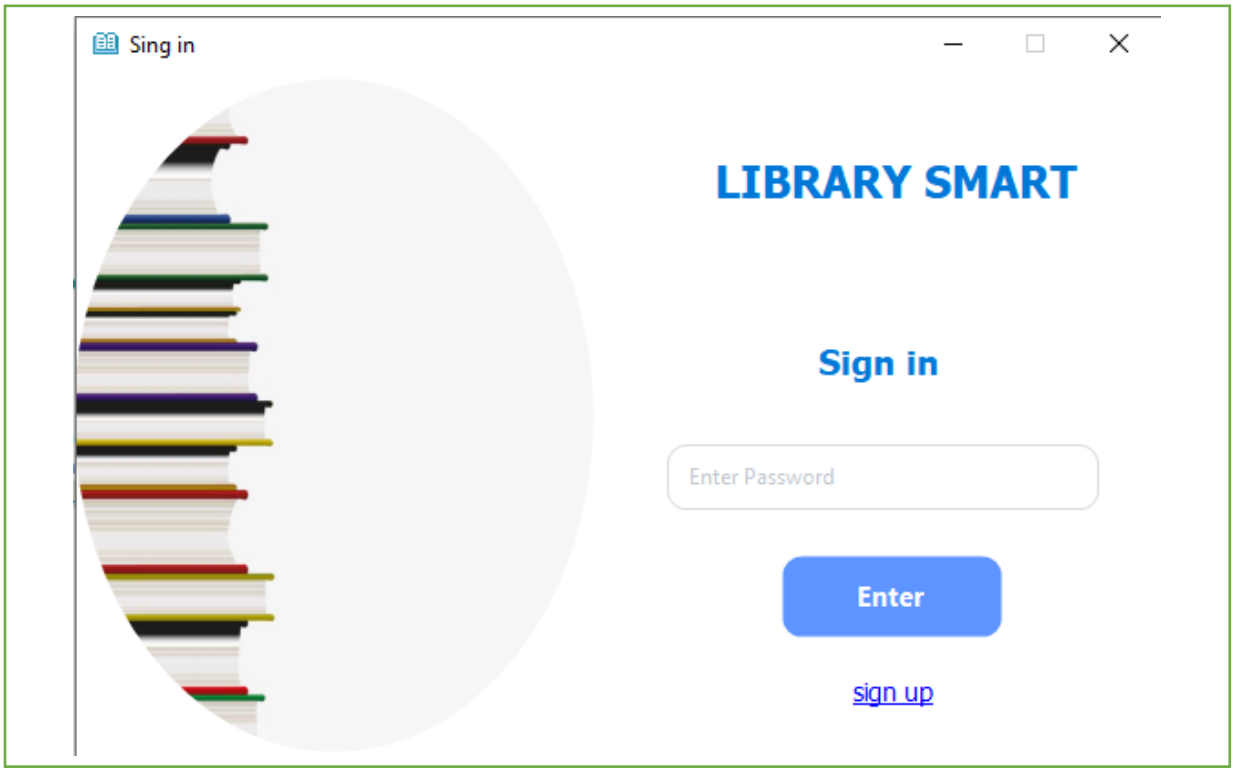


Figure Form 2 (Student)

```
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;

namespace Smart_Library
{
    public partial class second_pass_form_for_students : Form
    {
        smart_libraryEntities Smart_Library = new smart_libraryEntities();
        user user = new user();
```

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

        private void txtPass_KeyPress(object sender, KeyPressEventArgs e)
        {
            char c = e.KeyChar;
            if (char.IsDigit(c))
            {
                e.Handled = false;
            }
            else if (c == 8)
            {
                e.Handled = false;
            }
            else
            {
                e.Handled = true;
            }
        }

        private void guna2Button1_Click(object sender, EventArgs e)
        {
            try
            {
                int pass = Convert.ToInt32(txtPass.Text);
                var password = Smart_Library.users.Where(b => b.password ==
pass).Select(b => b.password);
                if (password.Contains(pass))
                {
                    main_student sd = new main_student();
                    sd.Show();
                    this.Hide();
                }
                else
                {
                    MessageBox.Show("your password wrong");
                }
            }
            catch (Exception ex)
            {
                MessageBox.Show(ex.Message);
            }


        }


        private void linkSignUp_LinkClicked(object sender,
LinkLabelLinkClickedEventArgs e)
        {
            signUp sp = new signUp();
            sp.Show();
            this.Hide();
        }
    }
}
```

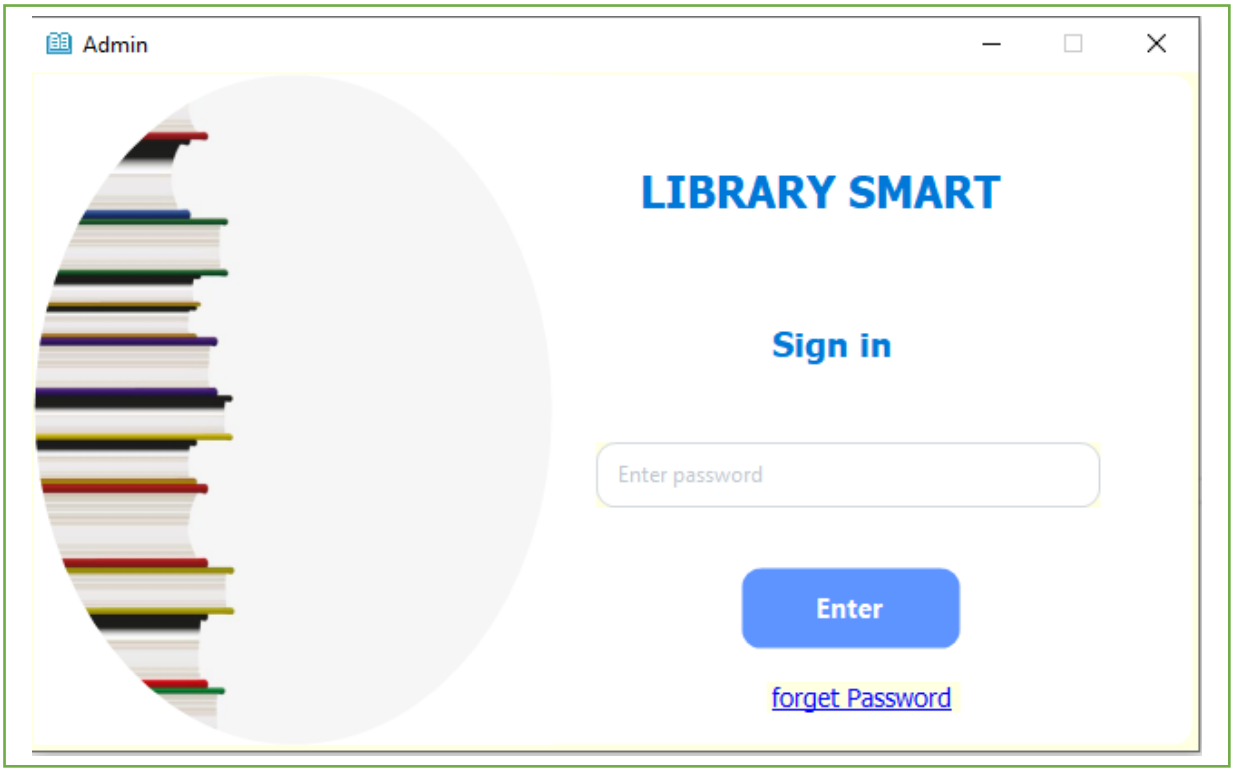


Figure 3 (Admin)

```
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 Microsoft.VisualBasic;

namespace Smart_Library
{
    public partial class secondForm : Form
    {
        smart_libraryEntities Smart_Library = new smart_libraryEntities();
        user user = new user();
        public secondForm()
        {
            InitializeComponent();

        }

        private void secondForm_Load(object sender, EventArgs e)
        {
            txtBoxPassword.Focus();
        }
```

```
        private void txtBoxPassword_KeyPress(object sender, KeyPressEventArgs
e)
        {
            char c = e.KeyChar;
            if (char.IsDigit(c))
            {
                e.Handled = false;
            }
            else if (c == 8)
            {
                e.Handled = false;
            }
            else
            {
                e.Handled = true;
            }
        }

        private void guna2Button1_Click(object sender, EventArgs e)
        {
            try
            {
                main_admin md = new main_admin();
                int pass = int.Parse(txtBoxPassword.Text);
                var password = Smart_Library.users.Where(b => b.password ==
pass).Select(b => b.password);

                if (password.Contains(pass))
                {
                    md.Show();
                    this.Hide();
                }
                else
                {
                    MessageBox.Show("wrong Password!");
                }
            }
            catch (Exception ex)
            {
                MessageBox.Show(ex.Message);
            }
        }


        private void linkSignUP_LinkClicked(object sender,
LinkLabelLinkClickedEventArgs e)
        {
            try
            {

                MessageBox.Show("change password successfully");
            }
            catch(Exception ex)
            {
                MessageBox.Show(ex.Message);
            }
        }

        private void linkFrogetPass_LinkClicked(object sender,
LinkLabelLinkClickedEventArgs e)
        {
            int DefaultPass = 2468;
```

```
            string defaultNumber = Interaction.InputBox("Check Default
Number", "InputBox");
            if (int.Parse(defaultNumber) == DefaultPass)
            {
                string newName = Interaction.InputBox("Enter New Name",
"InputBox");
                string pass = Interaction.InputBox("Enter New Password",
"InputBox");

                user u = new user
                {
                    id = Smart_Library.users.Count() + 1,
                    username = newName,
                    password = int.Parse(pass),
                };
                Smart_Library.users.Add(u);
                Smart_Library.SaveChanges();
                MessageBox.Show("successfully");
            }

        }
    }
}
```

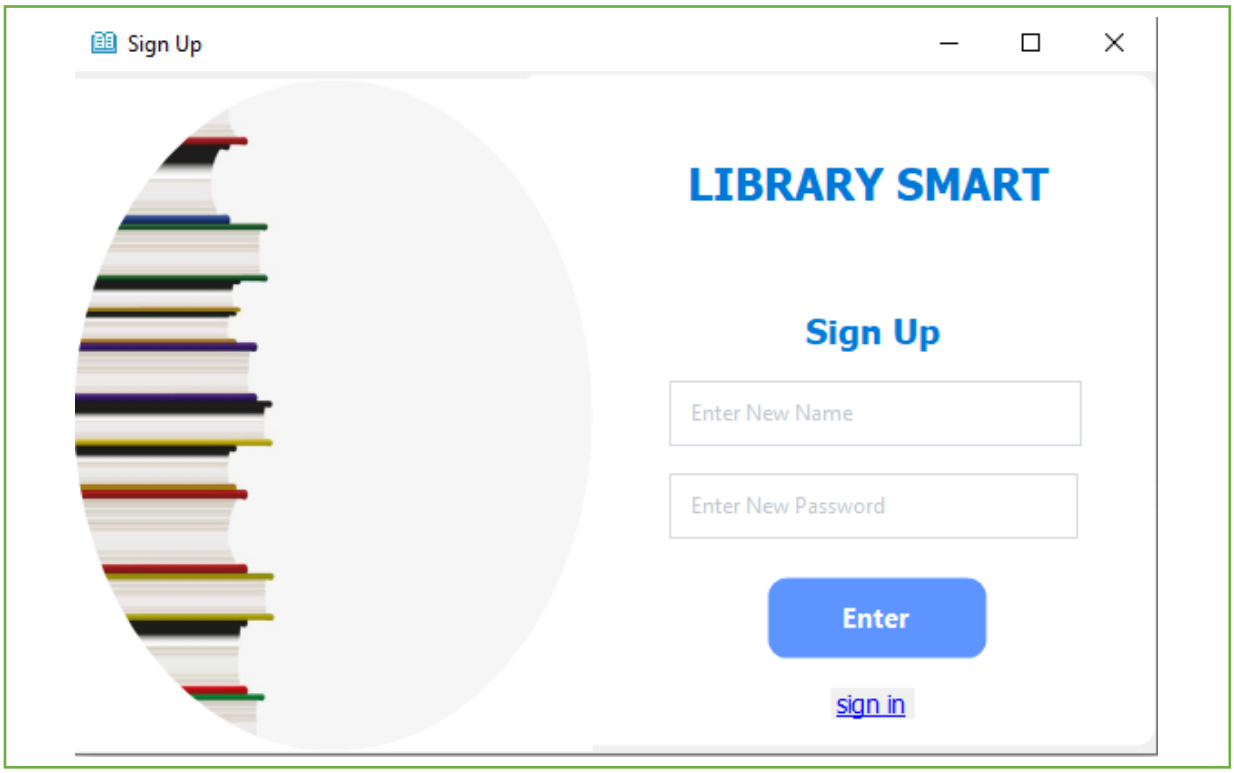


Figure Form 4 (Student)

```
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;

namespace Smart_Library
{
    public partial class signUp : Form
    {
        public static string name;
        smart_libraryEntities smart_Library = new smart_libraryEntities();
        user user = new user();
        public signUp()
        {
            InitializeComponent();
        }

        private void linkLabel1_LinkClicked(object sender,
LinkLabelLinkClickedEventArgs e)
        {
            second_pass_form_for_students sd = new
second_pass_form_for_students();
            sd.Show();
            this.Hide();
        }

        private void btnEnter_Click(object sender, EventArgs e)
        {
            try
            {
                int count = smart_Library.users.Count();
                user ur = new user()
                {
                    id = count + 1,
                    username = txtName.Text,
                    password = Convert.ToInt32(txtPass.Text)
                };
                smart_Library.users.Add(ur);
                smart_Library.SaveChanges();
                MessageBox.Show("Add new user successfully");
                this.Hide();
                second_pass_form_for_students sd = new
second_pass_form_for_students();
                sd.Show();
            }
            catch(Exception ex)
            {
                MessageBox.Show(ex.Message);
            }

        }

    }
}
```

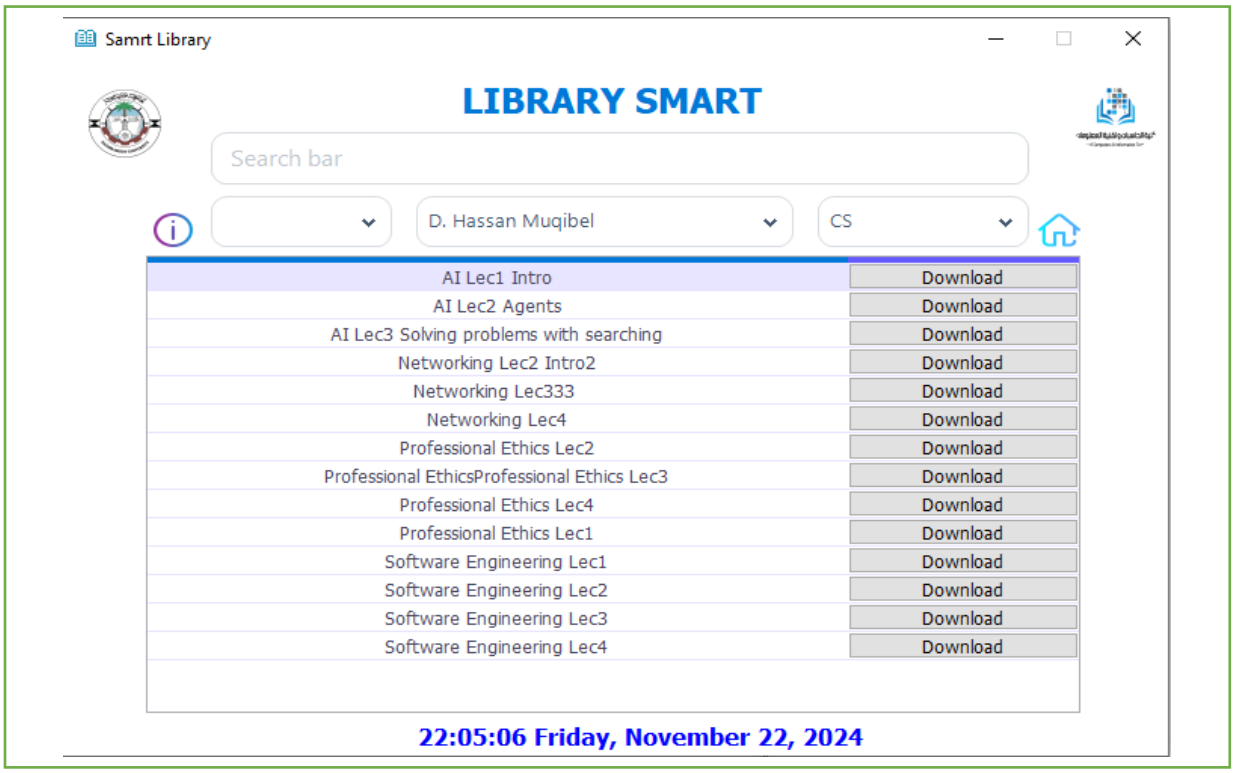


Figure Form 5 (Main Student Page)

```
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.Data.Entity.Migrations;
using System.Globalization; // Add this at the top of your file
using System.Net;
```

```
using System.IO;
using System.Net.Http;

namespace Smart_Library
{
   public partial class main_student : Form
   {
      smart_libraryEntities smartLibrary = new smart_libraryEntities();
      info_books books = new info_books();
      info_majors majors = new info_majors();
      info_teachers teachers = new info_teachers();

      public main_student()
      {
         InitializeComponent();
         var bookNames = smartLibrary.info_books.Select(b => new { b.id,
b.name_of_book, b.book_major, b.level, b.links, b.super }).ToList();
         dgvDisplayBooksG.DataSource = bookNames;
      }

      void btnDownload()
      {
         // Create a button column for downloading
         DataGridViewButtonColumn downloadButtonColumn = new
DataGridViewButtonColumn();
         downloadButtonColumn.HeaderText = "Download";
```

```
        downloadButtonColumn.Text = "Download"; // Text displayed on the
button

        downloadButtonColumn.Width = 100;

        downloadButtonColumn.UseColumnTextForButtonValue = true; //
Use the text for all rows

        downloadButtonColumn.DefaultCellStyle.ForeColor = Color.White; //
Set the background color for the Download button

        dgvDisplayBooksG.Columns.Add(downloadButtonColumn);

    }


    private void LoadMajors()

    {

        var majors = smartLibrary.info_majors.Select(m =>
m.name_major).ToList();

        cBoxMajordgv.DataSource = majors;

        dgvDisplayBooksG.RowTemplate.Height = 20; // Adjust this value as
needed

    }

    private void LoadTeachers()

    {

        var teachers = smartLibrary.info_teachers.Select(t =>
t.name_of_teacher).ToList();


        cBoxTeachersdgv.DataSource = teachers;

        dgvDisplayBooksG.RowTemplate.Height = 20; // Adjust this value as
needed

    }
```

```
    void DataLoad()
    {

        dgvDisplayBooksG.Columns[0].HeaderText = "Name Books";

        // Hide the links column
        dgvDisplayBooksG.Columns["id"].Visible = false;
        dgvDisplayBooksG.Columns["book_major"].Visible = false;
        dgvDisplayBooksG.Columns["level"].Visible = false;
        dgvDisplayBooksG.Columns["links"].Visible = false;
        dgvDisplayBooksG.Columns["super"].Visible = false;

        btnDownload();

        // Center-align text in the first two columns
        foreach (DataGridViewColumn column in
dgvDisplayBooksG.Columns)
        {
            column.DefaultCellStyle.Alignment =
DataGridViewContentAlignment.MiddleCenter;
        }

        // Set row height to create a gap effect
        dgvDisplayBooksG.RowTemplate.Height = 50; // Adjust this value as
needed

        // Set the font size for the DataGridView cells
```

```
        dgvDisplayBooksG.DefaultCellStyle.Font = new
Font(dgvDisplayBooksG.DefaultCellStyle.Font.FontFamily, 9f);




        // Set column widths
        int totalWidth = dgvDisplayBooksG.Width; // Get the total width of
the DataGridView
        dgvDisplayBooksG.Columns[1].Width = (int)(totalWidth * 0.75); //
75% for Name of Book
        dgvDisplayBooksG.Columns[5].Width = (int)(totalWidth * 0.7);


    }


    private void DownloadBook(string url, string bookTitle) // string
username, string password
    {
        using (var client = new WebClient())
        {
            try
            {
                // Set Basic Authentication header
                //client.Credentials = new NetworkCredential(username,
password);


                // Create a safe filename by removing invalid characters
                string safeFileName = string.Join("_",
bookTitle.Split(Path.GetInvalidFileNameChars()));
```

```
            // Specify the local file path where you want to save the
downloaded file
            string localFilePath =
Path.Combine(Environment.GetFolderPath(Environment.SpecialFolder.My
Documents), $"{safeFileName}.pdf");
// Download the file
            //Download file
            client.DownloadFile(url, localFilePath);
            // message Done
            MessageBox.Show("Download completed: " + localFilePath,
"Download", MessageBoxButtons.OK, MessageBoxIcon.Information);
        }
        catch (Exception ex)
        {
            MessageBox.Show("An error occurred while downloading the
book: " + ex.Message, "Error", MessageBoxButtons.OK,
MessageBoxIcon.Error);
        }
    }
}

private void main_student_Load(object sender, EventArgs e)
{
    DataLoad();
    LoadMajors();
    LoadTeachers();
    dgvDisplayBooksG.CellContentClick +=
dgvDisplayBooksG_CellContentClick;
```

```
        // time
        timer1.Start();
    }

    private void dgvDisplayBooksG_CellContentClick(object sender,
DataGridViewCellEventArgs e)
    {
        // Check if the clicked cell is in the Download column
        if (e.RowIndex >= 0 && e.ColumnIndex == 2) // Adjust the index if
needed
        {
            // Get the link from the hidden links column
            string link =
dgvDisplayBooksG.Rows[e.RowIndex].Cells["links"].Value.ToString();
            string bookTitle =
dgvDisplayBooksG.Rows[e.RowIndex].Cells["name_of_book"].Value.ToStrin
g();

            if (!string.IsNullOrEmpty(link))
            {
                DownloadBook(link, bookTitle);
            }
            else
            {
                MessageBox.Show("No download link available.", "Error",
MessageBoxButtons.OK, MessageBoxIcon.Error);
            }
        }
```

```
    }
    // filtering by teacher
    private void FilterBooksByTeacher(string selectedTeacher)
    {
        int selectedTeacherId = GetTeacherIdFromName(selectedTeacher);

        var filteredBooks = smartLibrary.info_books
            .Where(b => b.super == selectedTeacherId)
            .Select(b => new { b.id, b.name_of_book, b.book_major, b.level,
b.links, b.super })
            .ToList();

        dgvDisplayBooksG.DataSource = filteredBooks;
    }
    // get teacher id from name
    private int GetTeacherIdFromName(string teacherName)
    {
        var teacher = smartLibrary.info_teachers.FirstOrDefault(t =>
t.name_of_teacher == teacherName);
        return teacher?.id_teacher ?? 0;
    }

    // filtering by major
    // filtering according majors
    private void FilterBooksByMajors(string selectedMajor)
    {
        int selectedMajorId = GetMajorIdFromName(selectedMajor);
```

```
        var filteredBooks = smartLibrary.info_books
            .Where(b => b.book_major == selectedMajorId)
            .Select(b => new { b.id, b.name_of_book, b.book_major, b.level,
b.links, b.super })
            .ToList();

        dgvDisplayBooksG.DataSource = filteredBooks;
    }

    // // get major id from name
    private int GetMajorIdFromName(string MajorName)
    {
        var major = smartLibrary.info_majors.FirstOrDefault(t =>
t.name_major == MajorName);
        return major?.id_mejors ?? 0;
    }

    private void cboxMajor_SelectedIndexChanged(object sender,
EventArgs e)
    {
        if (cBoxMajordgv.SelectedItem != null)
        {
            string selectedMajor = cBoxMajordgv.SelectedItem.ToString();
            FilterBooksByMajors(selectedMajor);
        }
    }
```

```
    private void cBoxleveldgv_SelectedIndexChanged(object sender,
EventArgs e)
    {
        string selectedLevel = cBoxleveldgv.Text;


        var filteredBooks = smartLibrary.info_books
            .Where(b => b.level == selectedLevel)
            .Select(l => new { l.id, l.name_of_book, l.book_major, l.level,
l.links, l.super })
            .ToList();
        dgvDisplayBooksG.DataSource = filteredBooks;
    }


    private void cBoxTeachersdgv_SelectedIndexChanged(object sender,
EventArgs e)
    {
        if (cBoxTeachersdgv.SelectedItem != null)
        {
            string selectedTeacher =
cBoxTeachersdgv.SelectedItem.ToString();
            FilterBooksByTeacher(selectedTeacher);
        }
    }


    private void txtSearchMainS_TextChanged(object sender, EventArgs e)
```

```
    {
        string searchText = txtSearchMainS.Text.ToLower(); // Get the search
text


        var filteredBooks = smartLibrary.info_books
            .Where(b => b.name_of_book.ToLower().Contains(searchText))
            .Select(b => new { b.id, b.name_of_book, b.book_major, b.level,
b.links })
            .ToList();


        dgvDisplayBooksG.DataSource = filteredBooks; // Update the
DataGridView
        // Set row height to create a gap effect
        dgvDisplayBooksG.RowTemplate.Height = 20; // Adjust this value as
needed
    }


    private void RefreshDataGridView()
    {
        // Retrieve the latest data from the database
        var bookNames = smartLibrary.info_books.Select(b => new { b.id,
b.name_of_book, b.book_major, b.level, b.links, b.super }).ToList();


        // Update the DataGridView
        dgvDisplayBooksG.DataSource = bookNames;


    }
```

```
    private void pictureBox4_Click(object sender, EventArgs e)
    {
        RefreshDataGridView();
    }

    private void timer1_Tick(object sender, EventArgs e)
    {
        CultureInfo culture = new CultureInfo("en-US");
        labTime.Text = $"{DateTime.Now.ToString("HH:mm:ss", culture)}
{DateTime.Now.ToString("dddd, MMMM dd, yyyy", culture)}";
        labTime.ForeColor = Color.Blue;
    }

    private void picInfo_Click(object sender, EventArgs e)
    {
        LinkLabel linkUniver = new LinkLabel();
        linkUniver.Text = "https://hu.edu.ye/";

        //
        Label labUniver = new Label()
        {
            Text = "Hadramout Unversity",
            Font = new Font("Arial", 20, FontStyle.Bold),
        };
```

```
المكتبة الذكية تعتبر "+"\n" + labUniver.Text + "\t\t\t"MessageBox.Show(
+ ".ثورة جديدة في تقديم المصادر العلمية للطلاب و اعضاء الهيئة التدريسية

تسعى المكتبة الالكترونية على تبسيط عملية البحث عن الكتب والمحاضرات على "
+ "صفحة واحدة بسيطة التصميم،

يتوفر ضمن النظام وسائل البحث المتنوعة للكتب التي تساعد في ايجاد الكتاب او "
+ ".المحاضرة المراده

+ "ونتمنى ان يتم تطوير هذا المشروع في المستقبل لتحقيق الرؤية التاريخية للجامعة"

" + ".التي قد اوصت بتطوير التعليم و البحث العلمي

هذه المكتبة أيضًا تساهم بشكل فعال في تعزيز بيئة التعلم الحالية بطريقة تلبي : "
+ ".متطلبات الطلاب والأكاديميين بطريقة مبتكرة ومريحة

"موقع الجامعة" + linkUniver.Text);

    }

  }

}
```

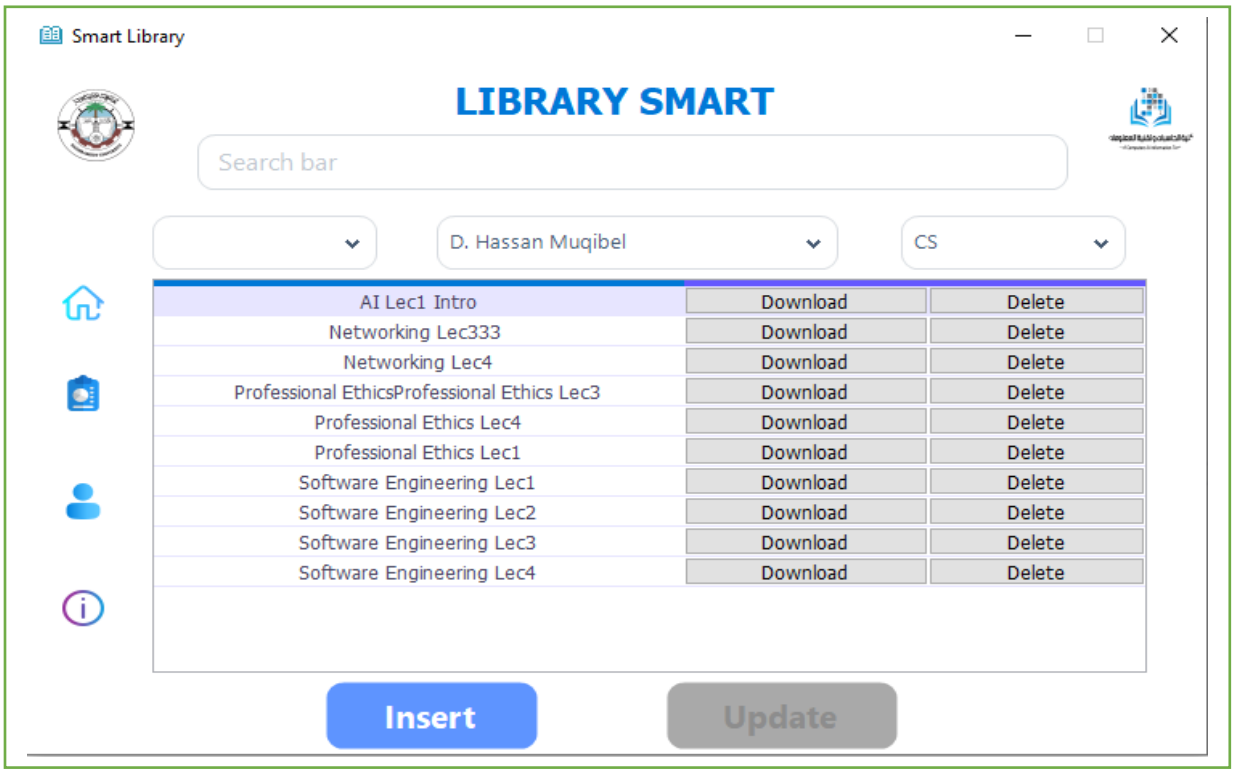


Figure Form 6 (Main Admin Page)

```
using System;
using System.Collections.Generic;
using System.ComponentModel;
using System.Data;
using System.Drawing;
using System.Linq;
using System.Data.SqlClient;
using System.Text;
using System.Threading.Tasks;
using System.Windows.Forms;
using System.Data.Entity.Migrations;
using System.Net;
using System.IO;
using System.Net.Http;
using System.Data.Entity;
```

```
using MigraDoc.DocumentObjectModel;
using MigraDoc.Rendering;
using PdfSharp.Pdf;
using MigraDoc.DocumentObjectModel.Fields;
using Color = MigraDoc.DocumentObjectModel.Color;
using MigraDoc.DocumentObjectModel.Tables;
using iTextSharp.text.pdf;
using iTextSharp.text;
using Document = iTextSharp.text.Document;

namespace Smart_Library
{
   public partial class main_admin : Form
   {
      smart_libraryEntities smartLibrary = new smart_libraryEntities();
      info_books books = new info_books();
      info_majors majors = new info_majors();
      info_teachers teachers = new info_teachers();
      user User = new user();

      Document Document = new Document();

      public static string nameOfTeacher;
      public main_admin()
      {
         InitializeComponent();
         var bookNames = smartLibrary.info_books.Select(b => new { b.id,
b.name_of_book, b.book_major, b.level, b.links, b.super }).ToList();
         dgvDisplayBooksG.DataSource = bookNames;
```

```
        dgvDisplayBooksG.CellContentClick += dgvDisplayBooksG_CellContentClick;


    }


    private void LoadTeachers()
    {
        var teachers = smartLibrary.info_teachers.Select(t =>
t.name_of_teacher).ToList();


        cBoxTeachersdgv.DataSource = teachers;
        dgvDisplayBooksG.RowTemplate.Height = 20; // Adjust this value as needed
    }
    // load users
    private void LoadUsers()
    {
        var users = smartLibrary.users.Select(d => new { d.id, d.username }).ToList();
        dgvDisplayBooksG.DataSource = users;


        // btn to delete user


        DataGridViewButtonColumn deleteButtonColumn = new
DataGridViewButtonColumn
        {
            HeaderText = "Delete User",
            Text = "Delete",
            UseColumnTextForButtonValue = true,
            Width = 100
        };
        deleteButtonColumn.UseColumnTextForButtonValue = true; // Use the text for all
rows
```

```
        dgvDisplayBooksG.Columns.Add(deleteButtonColumn);


    }


    private void LoadMajors()
    {
        var majors = smartLibrary.info_majors.Select(m => m.name_major).ToList();
        cBoxMajordgv.DataSource = majors;
        dgvDisplayBooksG.RowTemplate.Height = 20; // Adjust this value as needed
    }


    void btnDownload()
    {
        // Create a button column for downloading
        DataGridViewButtonColumn downloadButtonColumn = new
DataGridViewButtonColumn();
        downloadButtonColumn.HeaderText = "Download";
        downloadButtonColumn.Text = "Download"; // Text displayed on the button
        downloadButtonColumn.Width = 100;
        downloadButtonColumn.UseColumnTextForButtonValue = true; // Use the text
for all rows
        dgvDisplayBooksG.Columns.Add(downloadButtonColumn);
    }


    private void DownloadBook(int rowIndex)
    {
        try
        {
            // Get the book name and download URL from the selected row
```

```
        string bookName =
dgvDisplayBooksG.Rows[rowIndex].Cells["name_of_book"].Value?.ToString(); // Ensure
null safety

        string downloadUrl =
dgvDisplayBooksG.Rows[rowIndex].Cells["links"].Value?.ToString();


        if (string.IsNullOrWhiteSpace(bookName) ||
string.IsNullOrWhiteSpace(downloadUrl))

        {

            MessageBox.Show("Book name or download link is missing.", "Error",
MessageBoxButtons.OK, MessageBoxIcon.Error);

            return;

        }


        // Convert Google Drive link to direct download link if applicable

        if (downloadUrl.Contains("/d/") && downloadUrl.Contains("/view"))

        {

            string fileId = downloadUrl.Split(new string[] { "/d/", "/view" },
StringSplitOptions.None)[1];

            downloadUrl =
$"https://drive.google.com/uc?export=download&id={fileId}";

        }


        // Check if the link is valid

        Uri uriResult;

        bool isValidUrl = Uri.TryCreate(downloadUrl, UriKind.Absolute, out uriResult)
&& (uriResult.Scheme == Uri.UriSchemeHttp || uriResult.Scheme ==
Uri.UriSchemeHttps);

        if (!isValidUrl)

        {

            MessageBox.Show("Invalid download URL.", "Error",
MessageBoxButtons.OK, MessageBoxIcon.Error);

            return;
```

```
            }

            // Set the destination file path in the Downloads folder
            string downloadsPath =
Path.Combine(Environment.GetFolderPath(Environment.SpecialFolder.MyDocuments));
            string filePath = Path.Combine(downloadsPath, $"{bookName}.pdf");

            // Ensure file does not overwrite
            if (File.Exists(filePath))
            {
                MessageBox.Show($"The file '{filePath}' already exists. Rename the book or
delete the existing file.", "File Exists", MessageBoxButtons.OK,
MessageBoxIcon.Warning);
                return;
            }

            // Download the file
            using (WebClient client = new WebClient())
            {
                client.DownloadFile(downloadUrl, filePath);
                MessageBox.Show($"Book '{bookName}' downloaded successfully to
{downloadsPath}.", "Download Complete", MessageBoxButtons.OK,
MessageBoxIcon.Information);
            }
        }
        catch (WebException webEx)
        {
            MessageBox.Show($"Download failed: {webEx.Message}", "Error",
MessageBoxButtons.OK, MessageBoxIcon.Error);
        }
        catch (IOException ioEx)
```

```
        {
            MessageBox.Show($"File I/O error: {ioEx.Message}", "Error",
MessageBoxButtons.OK, MessageBoxIcon.Error);
        }
        catch (Exception ex)
        {
            MessageBox.Show($"An error occurred while downloading the book:
{ex.Message}", "Error", MessageBoxButtons.OK, MessageBoxIcon.Error);
        }
    }

    void btnDelete()
    {
        // Create a button column for deleting
        DataGridViewButtonColumn deleteButtonColumn = new
DataGridViewButtonColumn();
        deleteButtonColumn.HeaderText = "Delete";
        deleteButtonColumn.Text = "Delete"; // Text displayed on the button
        deleteButtonColumn.Width = 100;
        deleteButtonColumn.UseColumnTextForButtonValue = true; // Use the text for all
rows
        dgvDisplayBooksG.Columns.Add(deleteButtonColumn);

    }

    private void DeleteBook(int rowIndex)
    {
        try
        {
            // Get the book ID from the selected row
```

```
            int bookId = (int)dgvDisplayBooksG.Rows[rowIndex].Cells["id"].Value;

            // Find the book in the database
            var bookToDelete = smartLibrary.info_books.FirstOrDefault(b => b.id ==
bookId);

            if (bookToDelete != null)
            {
                // Delete the book from the database
                smartLibrary.info_books.Remove(bookToDelete);
                smartLibrary.SaveChanges();

                // Refresh the DataGridView
                MessageBox.Show("Book deleted successfully.", "Delete",
MessageBoxButtons.OK, MessageBoxIcon.Information);
                RefreshDataGridView();
            }
            else
            {
                MessageBox.Show("Failed to delete the book. The book was not found.");
                RefreshDataGridView();
            }
        }
        catch (Exception ex)
        {
            MessageBox.Show($"An error occurred while deleting the book: {ex.Message}",
"Error", MessageBoxButtons.OK, MessageBoxIcon.Error);
        }
    }
    void ColFalse()
```

```
    {
        // Hide the links column
        dgvDisplayBooksG.Columns["id"].Visible = false;
        dgvDisplayBooksG.Columns["book_major"].Visible = false;
        dgvDisplayBooksG.Columns["level"].Visible = false;
        dgvDisplayBooksG.Columns["links"].Visible = false;
        dgvDisplayBooksG.Columns["super"].Visible = false;
    }

    void DataLoad()
    {
        dgvDisplayBooksG.Columns[1].HeaderText = "Name Books";

        // Hide the links column
        ColFalse();

        btnDownload();
        btnDelete();

        // Center-align text in the first two columns
        foreach (DataGridViewColumn column in dgvDisplayBooksG.Columns)
        {
            column.DefaultCellStyle.Alignment =
DataGridViewContentAlignment.MiddleCenter;
        }

        dgvDisplayBooksG.RowTemplate.Height = 20; // Adjust this value as needed

        // Set the font size for the DataGridView cells
```

```
        dgvDisplayBooksG.DefaultCellStyle.Font = new
System.Drawing.Font(dgvDisplayBooksG.DefaultCellStyle.Font.FontFamily, 9f);


        // set column w
        getWidthFromDataGV(0.52, 0.23, 0.24);


    }
    // set column widths
    void getWidthFromDataGV(double sizeNameBook, double sizeBtnDownload,
double sizeBtnDelete)
    {
        int totalWidth = dgvDisplayBooksG.Width; // Get the total width of the
DataGridView
        dgvDisplayBooksG.Columns[1].Width = (int)(totalWidth * sizeNameBook); // 55%
for Name of Book
        dgvDisplayBooksG.Columns[5].Width = (int)(totalWidth * sizeBtnDownload); //
20% for btnDownloads
        dgvDisplayBooksG.Columns[6].Width = (int)(totalWidth * sizeBtnDelete); // 20%
for btnDeletes
    }


    private void dgvDisplayBooks_CellContentClick(object sender,
DataGridViewCellEventArgs e)
    {


    }


    // main form for admin Load
    private void main_admin_Load(object sender, EventArgs e)
    {
        DataLoad();
        LoadTeachers();
```

```
        LoadMajors();
        btnUpdatedgv.Enabled = false; // Initially disable the update button
        dgvDisplayBooksG.CellContentClick += dgvDisplayBooksG_CellContentClick;
        dgvDisplayBooksG.SelectionChanged += dgvDisplayBooksG_SelectionChanged; //
Attach selection
    }
    private void dgvDisplayBooksG_SelectionChanged(object sender, EventArgs e)
    {
        // Enable the Update button if any row is selected
        btnUpdatedgv.Enabled = dgvDisplayBooksG.SelectedRows.Count > 0;


    }



    // get name teacher through super
    private string getNameTeacherThroughSuper(int super)
    {
        var teacher = smartLibrary.info_teachers.FirstOrDefault(t => t.id_teacher ==
super);
        return teacher?.name_of_teacher ?? "Unknown";
    }



    // filtering according teacher
    private void FilterBooksByTeacher(string selectedTeacher)
    {
        int selectedTeacherId = GetTeacherIdFromName(selectedTeacher);


        var filteredBooks = smartLibrary.info_books
            .Where(b => b.super == selectedTeacherId)
```

```
            .Select(b => new { b.id, b.name_of_book, b.book_major, b.level, b.links,
b.super })
            .ToList();

        dgvDisplayBooksG.DataSource = filteredBooks;
    }

    // get teacher id from name
    private int GetTeacherIdFromName(string teacherName)
    {
        var teacher = smartLibrary.info_teachers.FirstOrDefault(t => t.name_of_teacher
== teacherName);
        return teacher?.id_teacher ?? 0;
    }

    // filtering according majors
    private void FilterBooksByMajors(string selectedMajor)
    {
        int selectedMajorId = GetMajorIdFromName(selectedMajor);

        var filteredBooks = smartLibrary.info_books
            .Where(b => b.book_major == selectedMajorId)
            .Select(b => new { b.id, b.name_of_book, b.book_major, b.level, b.links,
b.super })
            .ToList();

        dgvDisplayBooksG.DataSource = filteredBooks;
    }

    // // get major id from name
```

```
    private int GetMajorIdFromName(string MajorName)
    {
        var major = smartLibrary.info_majors.FirstOrDefault(t => t.name_major ==
MajorName);
        return major?.id_mejors ?? 0;
    }

    private void pictureBox4_Click(object sender, EventArgs e)
    {
        if (dgvDisplayBooksG.Columns.Count > 1)
        {
            dgvDisplayBooksG.Columns.Clear();
        }
        RefreshDataGridView();
        btnInsertdgv.Enabled = true;
        btnUpdatedgv.Enabled = false;

    }
    private void RefreshDataGridView()
    {
        if(dgvDisplayBooksG.Columns.Count <= 2)
        {
            var bookNames = smartLibrary.info_books.Select(b => new { b.id,
b.name_of_book, b.book_major, b.level, b.links, b.super }).ToList();
            // Update the DataGridView
            dgvDisplayBooksG.DataSource = bookNames;
            ColFalse();
            btnDownload();
            btnDelete();
            // set column w
```

```
            getWidthFromDataGV(0.52, 0.23, 0.24);
        }

        // Retrieve the latest data from the database
    }
    private void txtSearchMainA_TextChanged(object sender, EventArgs e)
    {
        string searchText = txtSearchMainA.Text.ToLower(); // Get the search text

        var filteredBooks = smartLibrary.info_books
            .Where(b => b.name_of_book.ToLower().Contains(searchText))
            .Select(b => new { b.id, b.name_of_book, b.book_major, b.level, b.links,
b.super })
            .ToList();

        dgvDisplayBooksG.DataSource = filteredBooks; // Update the DataGridView
        // Set row height to create a gap effect
        dgvDisplayBooksG.RowTemplate.Height = 20; // Adjust this value as needed
    }

    private void cBoxleveldgv_SelectedIndexChanged(object sender, EventArgs e)
    {
        string selectedLevel = cBoxleveldgv.Text;

        var filteredBooks = smartLibrary.info_books
            .Where(b => b.level == selectedLevel)
            .Select(l => new { l.id, l.name_of_book, l.book_major, l.level, l.links, l.super })
            .ToList();
        dgvDisplayBooksG.DataSource = filteredBooks;
```

```
}

private void cBoxMajordgv_SelectedIndexChanged(object sender, EventArgs e)
{
   if (cBoxMajordgv.SelectedItem != null)
   {
      string selectedMajor = cBoxMajordgv.SelectedItem.ToString();
      FilterBooksByMajors(selectedMajor);
   }
}

private void cBoxTeachersdgv_SelectedIndexChanged(object sender, EventArgs e)
{
   if (cBoxTeachersdgv.SelectedItem != null)
   {
      string selectedTeacher = cBoxTeachersdgv.SelectedItem.ToString();
      FilterBooksByTeacher(selectedTeacher);
   }
}

private void btnInsertdgv_Click(object sender, EventArgs e)
{
   var insert = new form_add_data_to_db();
   insert.Show();
}

private void btnUpdatedgv_Click(object sender, EventArgs e)
{
   if (dgvDisplayBooksG.SelectedRows.Count > 0) // Check if a book is selected
```

```
        {
            string name_major = "";
            var selectedRow = dgvDisplayBooksG.SelectedRows[0];
            int bookId = (int)selectedRow.Cells["id"].Value; // Get the book ID
            string bookName = selectedRow.Cells["name_of_book"].Value.ToString();
            int bookMajor = (int)selectedRow.Cells["book_major"].Value; // Assuming this
is an integer
            if (bookMajor == 1)
            {
               name_major = "CS";
            }
            else
            {
               name_major = "IT";
            }
            string level = selectedRow.Cells["level"].Value.ToString();
            int super = (int)selectedRow.Cells["super"].Value;

            string links = selectedRow.Cells["links"].Value.ToString();

            string nameTearcher = getNameTeacherThroughSuper(super);

            // Create an instance of the update form and pass the selected book's details
            var updateForm = new form_update_data_db(bookId, bookName,
name_major, level, nameTearcher, super, links);
            updateForm.ShowDialog(); // Show the form modally
        }
        else
        {
```

```
            MessageBox.Show("Please select a book to update.", "No Selection",
MessageBoxButtons.OK, MessageBoxIcon.Warning);
        }
    }

    private void main_admin_Click(object sender, EventArgs e)
    {

    }

    private void dgvDisplayBooksG_CellContentClick(object sender,
DataGridViewCellEventArgs e)
    {
        // Check if the clicked cell is in a valid column and row
        if (e.RowIndex >= 0 && e.ColumnIndex >= 0 && e.ColumnIndex <
dgvDisplayBooksG.Columns.Count)
        {

            // Check if the clicked cell is in the Download column
            if (dgvDisplayBooksG.Columns[e.ColumnIndex].HeaderText == "Download")
            {

                DownloadBook(e.RowIndex);

            }
            else if (dgvDisplayBooksG.Columns[e.ColumnIndex].HeaderText == "Delete")
            {
                // Confirm deletion
                var confirmResult = MessageBox.Show("Are you sure you want to delete this
book?",
```

```
                                    "Confirm Delete",
                                    MessageBoxButtons.YesNo,
                                    MessageBoxIcon.Question);
            if (confirmResult == DialogResult.Yes)
            {
               DeleteBook(e.RowIndex);
            }


         }
         else if(dgvDisplayBooksG.Columns[e.ColumnIndex].HeaderText == "Delete
User")
         {
            var confirmResult = MessageBox.Show("Are you sure you want to delete this
User?",
                                    "Confirm Delete",
                                    MessageBoxButtons.YesNo,
                                    MessageBoxIcon.Question);
            if(confirmResult == DialogResult.Yes)
            {
               DeleteUser(e.RowIndex);
            }
         }


      }
   }



   private void picReports_Click(object sender, EventArgs e)
   {
      if(dgvDisplayBooksG.Rows.Count > 0)
```

```
{
    SaveFileDialog save = new SaveFileDialog();
    save.Filter = "PDF (*.pdf)|*.pdf";
    save.FileName = "Result";

    bool ErrorMessage = false;

    if(save.ShowDialog() == DialogResult.OK)
    {
        if (File.Exists(save.FileName))
        {
            try
            {

            }
            catch (Exception ex)
            {
                ErrorMessage = true;
                MessageBox.Show("Unable to wride data in disk" + ex.Message);
            }
        }
        if (!ErrorMessage)
        {
            try
            {
                PdfPTable pTable = new PdfPTable(dgvDisplayBooksG.Columns.Count);
                pTable.DefaultCell.Padding = 2;
                pTable.WidthPercentage = 100;
                pTable.HorizontalAlignment = Element.ALIGN_LEFT;
```

```
    foreach(DataGridViewColumn col in dgvDisplayBooksG.Columns)
    {
        PdfPCell pCell = new PdfPCell(new Phrase(col.HeaderText));
        pTable.AddCell(pCell);
    }

    foreach(DataGridViewRow row in dgvDisplayBooksG.Rows)
    {
        foreach(DataGridViewCell dcell in row.Cells)
        {
            pTable.AddCell(dcell.Value.ToString());
        }
    }

    // greate pdf doc
    using (FileStream fs = new FileStream(save.FileName, FileMode.Create))
    {
        string sl = "Smart Library";
        Document doc = new Document();
        doc.Open();
        doc.AddTitle(sl);
        doc.Add(pTable);
        doc.Close();
        fs.Close();
    }
    MessageBox.Show("Report Export Successfully");

}
```

```
                catch(Exception ex)
                {
                    MessageBox.Show("Error while Explorting Report" + ex.Message);
                }
            }
        }
    }
    else
    {
        MessageBox.Show("We can't Explort Report , Not Found Books");
    }

}

private void picUsers_Click(object sender, EventArgs e)
{
    // clear dgv
    dgvDisplayBooksG.Columns.Clear();
    LoadUsers();
    int totalWidth = dgvDisplayBooksG.Width; // Get the total width of the
DataGridView
    dgvDisplayBooksG.Columns[2].Width = (int)(totalWidth * 0.2); // 55% for Name
of Book

    btnInsertdgv.Enabled = false;
    btnUpdatedgv.Enabled = false;
}
private void DeleteUser(int rowIndex)
{
    try
```

```
        {
            // Get the book ID from the selected row
            int bookId = (int)dgvDisplayBooksG.Rows[rowIndex].Cells["id"].Value;

            // Find the book in the database
            var UserToDelete = smartLibrary.users.FirstOrDefault(b => b.id == bookId);

            if (UserToDelete != null)
            {
                // Delete the book from the database
                smartLibrary.users.Remove(UserToDelete);
                smartLibrary.SaveChanges();

                // Refresh the DataGridView
                MessageBox.Show("user deleted successfully.", "Delete",
MessageBoxButtons.OK, MessageBoxIcon.Information);
                RefreshDataGridView();
            }
            else
            {
                MessageBox.Show("Failed to delete the user. The user was not found.");
                RefreshDataGridView();
            }
        }
        catch (Exception ex)
        {
            MessageBox.Show($"An error occurred while deleting the user: {ex.Message}",
"Error", MessageBoxButtons.OK, MessageBoxIcon.Error);
        }
    }
```

```
    private void picInfo_Click(object sender, EventArgs e)
    {
        LinkLabel linkUniver = new LinkLabel();
        linkUniver.Text = "https://hu.edu.ye/";

        //
        Label labUniver = new Label()
        {
            Text = "Hadramout Unversity",
            Font = new System.Drawing.Font("Arial", 20, FontStyle.Bold),
        };

        MessageBox.Show("\t\t\t" + labUniver.Text + "\n" + " المكتبة الذكية تعتبر ثورة جديدة في
+ ".تقديم المصادر العلمية للطلاب و اعضاء الهيئة التدريسية
            تسعى المكتبة الالكترونية على تبسيط عملية البحث عن الكتب والمحاضرات على صفحة واحدة "
+ "بسيطة التصميم،
            ".يتوفر ضمن النظام وسائل البحث المتنوعة للكتب التي تساعد في ايجاد الكتاب او المحاضرة المراده "
+
            "ونتمنى ان يتم تطوير هذا المشروع في المستقبل  لتحقيق الرؤية التاريخية للجامعة" +
            " التي قد اوصت بتطوير التعليم و البحث العلمي" + ".
            هذه المكتبة أيضًا تساهم بشكل فعال في تعزيز بيئة التعلم الحالية بطريقة تلبي متطلبات الطلاب : "
+ ".والأكاديميين بطريقة مبتكرة ومريحة
            "موقع الجامعة" + linkUniver.Text);
    }
  }
}
```

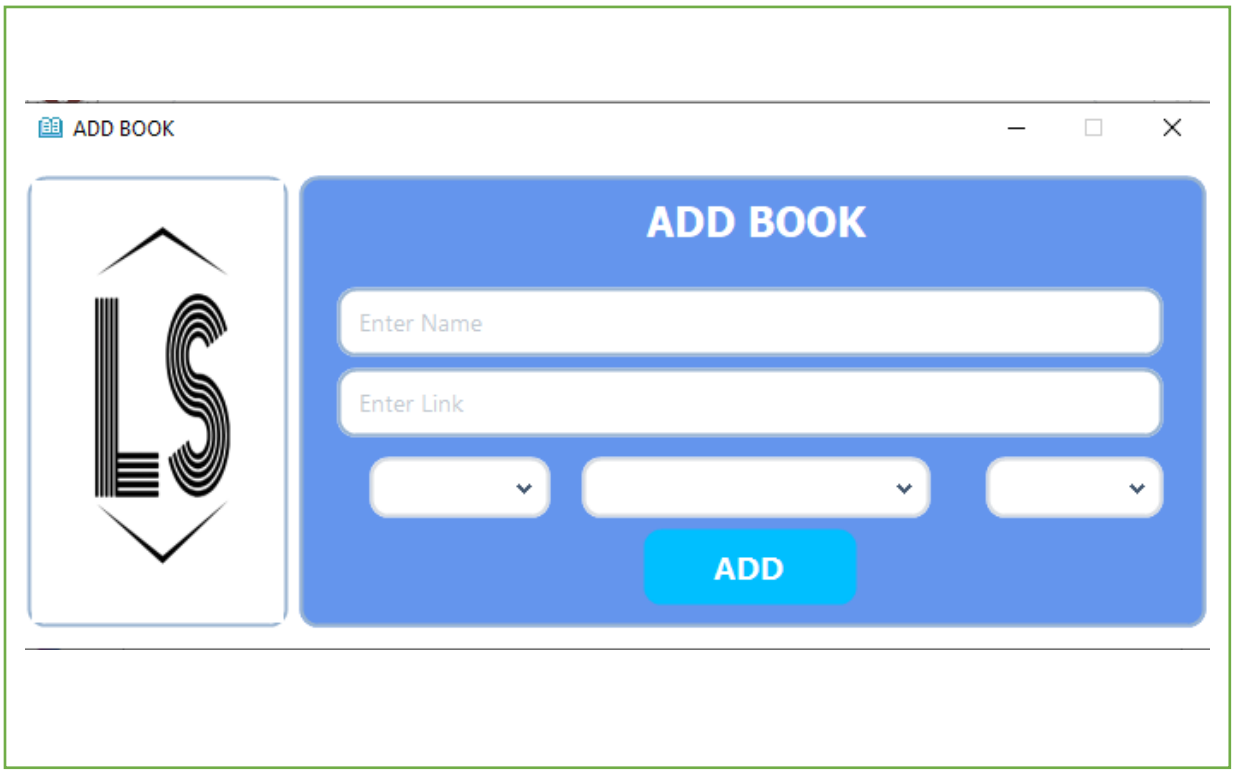


Figure Form 7 Add Book

```
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 Smart_Library;

namespace Smart_Library
{
    public partial class form_add_data_to_db : Form
    {
        smart_libraryEntities smartLibrary = new smart_libraryEntities();
        info_books books = new info_books();

        public form_add_data_to_db()
        {
            InitializeComponent();

        }

        private void labLevel_Click(object sender, EventArgs e)
        {

        }
        int getMajor(int major)
        {
```

```
            string selectedBookMajorId = cBoxMajors.SelectedItem.ToString();
// Cast to int
            if (selectedBookMajorId == "CS")
            {
                major = 1;
            }
            else if(selectedBookMajorId == "IT")
            {
                major = 2;
            }
            else
            {
                major = 0;
            }
            return major;
        }

        // get super on book
        private int GetTeacherIdFromName(string teacherName)
        {
            var teacher = smartLibrary.info_teachers.FirstOrDefault(t =>
t.name_of_teacher == teacherName);
            return teacher?.id_teacher ?? 0;
        }

        // get count for id
        int getCount(int count)
        {
            count = smartLibrary.info_books.Count(b => b.name_of_book ==
count.ToString());
            return count;
        }

        private void btnADD_Click(object sender, EventArgs e)
        {
            try
            {
                // get major
                int major = 0;

                // count of ID
                int totalID = smartLibrary.info_books.Count();

                // Get the selected string value from the ComboBox for level
                string selectedLevel = cBoxLevels.SelectedItem?.ToString();
// Get selected level as string

                books = new info_books()
                {
                    id = totalID + 2,
                    name_of_book = txtNameBooks.Text,
                    book_major = getMajor(major),
                    level = selectedLevel,
                    links = txtlink.Text,
                    super = GetTeacherIdFromName(cboxTeachers.Text)
                };
                //smartLibrary.info_books.Add(book);
                //int check = smartLibrary.SaveChanges();
                // Add the new book to the database
                MessageBox.Show(books.id.ToString());
                using (var context = new smart_libraryEntities())
                {
                    context.info_books.Add(books);
```

```
                    context.SaveChanges(); // This will insert the new book
and auto-generate the ID
                }
                MessageBox.Show("Book added successfully!");
                this.Hide();
            }
            catch (Exception ex)
            {
                MessageBox.Show(ex.Message);
            }


        }

    }
}
```

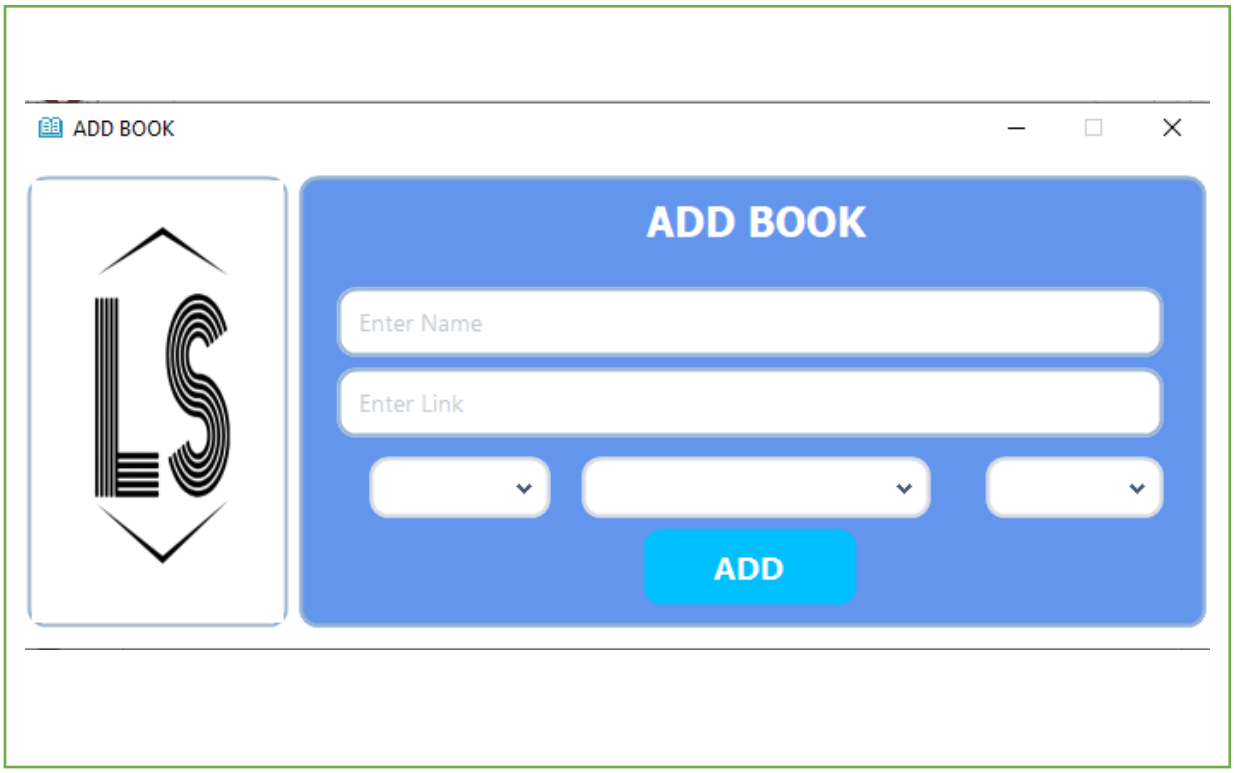


Figure Form 8 (Update Book)

```
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.Data.Entity;

namespace Smart_Library
{
    public partial class form_update_data_db : Form
```

```
    {
        smart_libraryEntities smartLibrary = new smart_libraryEntities();
        info_books books = new info_books();

        int bookID;
        int IDMajor;
        string superr;

        public form_update_data_db(int id, string name, string major, string
level, string teacher, int super, string links)
        {
            InitializeComponent();

            bookID = id;
            txtNameBooks.Text = name; // Assuming you have a TextBox for book
name
            cBoxMajors.Text = major; // Assuming you have a ComboBox for book
major
            cboxTeachers.Text = teacher;
            cBoxLevels.SelectedItem = level; // Assuming you have a ComboBox
for level
            txtlink.Text = links; // Assuming you have a TextBox for links
            string selectedItem = cboxTeachers.SelectedItem.ToString();
            superr = super.ToString();

        }



        void getTeachersNames()
        {
            var teachers = smartLibrary.info_teachers.Select(t =>
t.name_of_teacher);
            cboxTeachers.DataSource = teachers;
        }


        private void btnUpdate_Click(object sender, EventArgs e)
        {
            // Update the book's details
            var bookToUpdate = smartLibrary.info_books.Find(bookID);
            if (bookToUpdate != null)
            {

                if (cBoxMajors.Text == "CS")
                {
                    IDMajor = 1;
                }
                else
                {
                    IDMajor = 2;
                }


                bookToUpdate.name_of_book = txtNameBooks.Text;
                bookToUpdate.book_major = IDMajor; // Cast to int
                bookToUpdate.level = cBoxLevels.SelectedItem.ToString(); //
Get selected level as string
                bookToUpdate.super = int.Parse(superr);
                bookToUpdate.links = txtlink.Text;
```

```
                smartLibrary.Entry(bookToUpdate).State =
EntityState.Modified;
                smartLibrary.SaveChanges(); // Save changes to the database
                MessageBox.Show("Book updated successfully!", "Update",
MessageBoxButtons.OK, MessageBoxIcon.Information);
                this.Close(); // Close the update form
            }
            else
            {
                MessageBox.Show("Book not found.", "Error",
MessageBoxButtons.OK, MessageBoxIcon.Error);
            }
        }

    }
}
```