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A full Library Management System developed using Visual Basic dot net (2015) and Access (2013) database file

Experiment Findings · August 2021

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A Library Management System

For a department of atmospheric sciences

(AtmoLib)

Dr. Thaer Obaid Roomi

Introduction

AtmoLib is an application of a library management system for the Department of Atmospheric Sciences in the College of Science at Mustansiriyah University, Baghdad Iraq. The system was developed in 2018 by Dr. Thaer Obaid Roomi, a teacher in the department using the programming language Visual Basic dot net 2015. The application was linked with a database file of Microsoft Office Access 2013. The database includes titles of books and theses, authors' names, publishers, edition and year of publication in addition to the bookcase number and the book number in the locker. The application is used to search for the book or thesis through the title, topic, or author's name. Finding the book or thesis will display all its details. The application also provides the library administrator (librarian) the advantage of conducting statistics on the contents of the library by categories, as well as providing the head of the department with reports on the contents of the library in an easy and efficient manner.

The application can be easily modified to be suitable for any department's library. This tutorial gives sufficient information for anyone to start developing his own application. It is worth to mention that the application did not developed further to support books borrowing. The current version offers searching books in the access database file.

This tutorial contains a brief definition of the interfaces (forms), objects properties and codes. Extra information about the database file were given as wel.

تطبيق نظام إدارة المكتبات لقسم علوم الجو (اتموليب AtmoLib)

مقدمة

التطبيق اتموليب هو عبارة عن نظام إدارة مكتبة قسم علوم الجو في كلية العلوم بالجامعة المستنصرية. تم تطوير النظام من قبل الدكتور ثائر عبيد رومي التدريسي في قسم علوم الجو باستخدام اللغة البرمجية Visual Basic dot net 2015. وتم ربط التطبيق مع قاعدة البيانات المخزنة باستخدام Microsoft Office Access 2013. قاعدة البيانات تتضمن عناوين الكتب والاطاريح وأسماء المؤلفين ودور النشر وأرقام الطبقات وسنة النشر بالإضافة الى رقم خزانة الكتب ورقم الكتاب في الخزانة. يستخدم التطبيق للبحث عن الكتاب او الاطروحة من خلال العنوان او الموضوع او اسم المؤلف وعند العثور على الكتاب او الاطروحة تظهر جميع التفاصيل الخاصة به ويتم من خلال رقم الخزانة ورقم الكتاب او الاطروحة الاستدلال على مكانه بسرعة. كما يوفر التطبيق لمسؤول المكتبة (المكتبي) ميزة اجراء الإحصاءات الخاصة بمحتويات المكتبة حسب الفئات وكذلك تزويد الجهات المسؤولة بالتقارير الخاصة بمحتويات المكتبة بشكل سهل وكفوء.

سيتم تطوير التطبيق لاحقاً لتكون عملية الإعارة الكترونية بشكل كامل.

المطلوب في الوقت الحالي من مركز الحاسبة في الجامعة المستنصرية: إعادة برمجة النظام ليكون قابلاً للتنزيل في شبكة الانترنت على موقع الجامعة المستنصرية ليتمكن الباحثين والطلبة والمهتمين من البحث في محتويات المكتبة.

محتويات هذا المستند

يحتوي هذا المستند على تعريف مختصر للواجهات زائداً الكود البرمجي للنوافذ بالإضافة الى معلومات أخرى مهمة تتعلق بهذا التطبيق. ان الواجهة الرئيسية للتطبيق تكون كما في الشكل (1)



Figure 1. Welcome form

Click on (i) button shows About Form (See Figure 2)

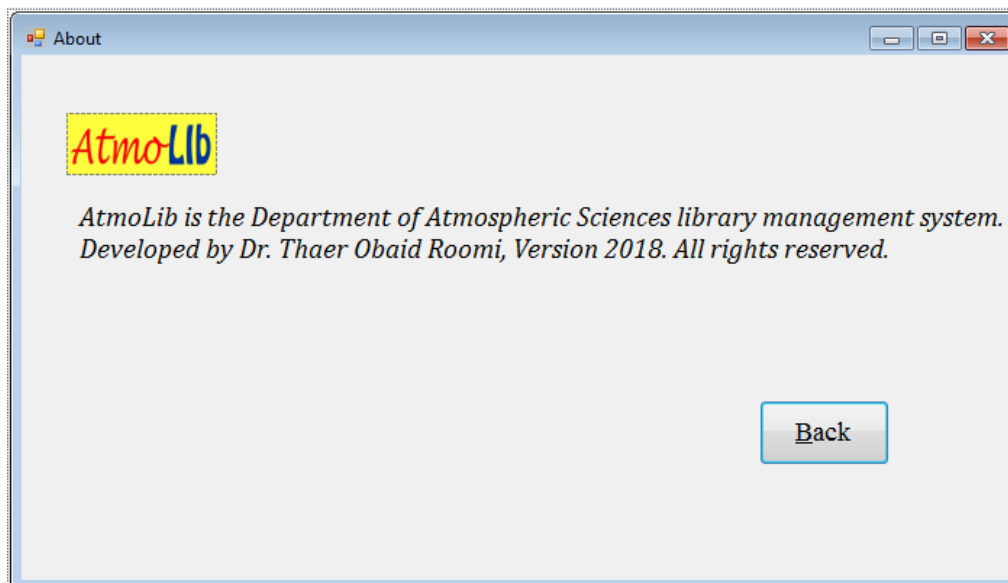


Figure 2. About form

Clicking Start will show Search window (See Figure 3)

The screenshot shows a web application titled "Search Library". At the top, there's a navigation bar with "1 of 597" and some icons. The main content area is divided into several sections:

- 1 Search Options:** A dropdown menu is set to "All".
- 2 Search:** A text input field containing "Statistical Analysis in Climate Research" and a green "Find" button (labeled 3).
- Search Results:** A list of results including "Statistical Analysis in Climate Research", "Essentials of Statistics", "Statistics for Research", "Statistical Methods in the Atmospheric Sciences", and "الطرق الاحصائية".
- Chosen Books:** A section with "Add to Box" and "Remove" buttons (labeled 4).
- Book Details:** Fields for ID (1), Author (Hans von Storch and Francis W. Zwiers), Title (Statistical Analysis in Climate Research), Publisher (Cambridge University Press), Edition (1), Type (Book), Year (2003), Country (USA), Language (En), Subject (Statistics - Climate), Pages Total, Book SN, Locker No. (A), and Book No. (1).
- Book total in library:** 17.
- Notes:** A text area (labeled 5) and a green "Borrow" button.

Figure 3. Search form

There are three options of search from a down-drop list (Author, Title and Subject) (see Figure 4)

This screenshot is similar to Figure 3, but the "1 Search Options" dropdown menu is open, showing three options: "Author", "Title", and "Subject". The "Author" option is highlighted in green. The rest of the interface, including the search results and book details, remains the same as in Figure 3.

Figure 4. Search Options

The objects in the red rectangle may not be used at the current time since they are related to borrowing function.

The screenshot shows a 'Search Library' window. At the top, there's a search bar with a dropdown menu (labeled 1) and a 'Find' button (labeled 3). Below the search bar, there's a list of search results. A red rectangle highlights the 'Chosen Books' section, which contains an 'Add to Box' button (labeled 4) and a 'Remove' button. Below this, there's a detailed view of a book with fields for ID, Author, Title, Publisher, Edition, Type, Year, Country, Language, Subject, Pages Total, Book SN, Locker No., Book No., and Book total in library. A 'Borrow' button (labeled 5) is located at the bottom right of the book details.

Figure 5. The unnecessary objects that could be neglected now

Come back to the Welcome Form and click on the Librarian Zone button. You will get the form in Figure 6. You should write the user name and password to get to the Library Management window.

The screenshot shows a 'Librarian Login' window. It has a title bar 'Librarian Login'. The main content area has the title 'Librarian Log In' in red. Below the title, there are two input fields: 'User Name' and 'Password'. Below these fields is a 'Log In' button. At the bottom of the window, there are three buttons: 'Change Accounts', 'Back', and 'Exit'.

Figure 6. Librarian User name and password form

Getting the permission will lead you to the Library Management window (Figure 7)

Library Management

of 597

SortAuthors

Management of Records by the Librarian

03 / 08 / 2021 09: 40:09

ID	Author	Title	Editto	Year	Publisher	Country	Specification	Type	Locker	Book no.	Total	Book SN	Notes	Langus	Pages
1	Hans von Storch and Francis W. Zwiers	Statistical Analysis in Climate Research	1	2003	Cambridge Univ...	USA	Statistics - Climate	Book	A	1	17			En	
2	David Brink	Essentials of Statistics	1	2010	David Brink and ...	Sweden	Statistics	Book	A	2	6			En	
3	Shirley Dowdy, Stanley Weardon and Daniel Chilk	Statistics for Research	3	2004	John and Wiley Sons...	USA	Statistics	Book	A	3	8			En	
4	Daniel S. Wilks	Statistical Methods in the Atmospheric Sciences	3	2011	Elsevier	USA	Statistic - Atmo...	Book	A	4	9			En	
5	محمد صليحي ابو صالح	الطرق الاحصائية		2009	دار البازوري	الاردن	Statistics	Book	A	5	1			Ar	
6	Prem S. Mann	Introductory Statistics		2004	John Wiley Sons...	USA	Statistics	Book	A	6	1			En	
7	Daniel S. Wilks	Statistical Methods in the Atmospheric Sciences	2	2006	Elsevier	USA	Statistics - Atmo...	Book	A	7	4			En	
8	صالح رشيد بطارسة	الإحصاء والاحتمالات	1	2009	دار اسامة	الاردن	Statistics	Book	A	8	1			Ar	
9	Arnold Naiman, Robert Rosenfeld and Gene Zirkel	Understanding Statistics	3	1983	McGraw-Hill, Inc		Statistics	Book	A	9	1			En	
10	عادل احمد هدي	نظرية القرار الاحصائية	1	1992	جامعة الموصل - كلية الادارة والاقتصاد	العراق	Statistics	Book	A	10	1			Ar	

Search Based on Title

Start Search Reset Me

Sort Authors Alphatically

Back Exit Report

Total Books in Library

Figure 7. Library management form (librarian responsibility)

You can make a report of the library contents via Report form (Figure 8). Choose the preferred type of files (Excel, PDF or Word).

Department of Atmospheric Sciences Library Report

1 of 2 ?

100%

Find | Next

Search

Excel
PDF
Word

List of books, theses, and publications in the library

ID	Author	Title	Edditi on	Year P	Publisher	Type	Total
1	Hans von Storch and Francis W. Zwiers	Statistical Analysis in Climate Research	1	2003	Cambridge University Press	Book	17
2	David Brink	Essentials of Statistics	1	2010	David Brink and Ventus Publishing APS	Book	6
3	Shirley Dowdy, Stanley Weardon and Daniel Chilk	Statistics for Research	3	2004	John and WiLey Sons, INC	Book	8
4	Daniel S. Wilks	Statistical Methods in the Atmospheric Sciences	3	2011	Elsevier	Book	9
5	محمد صليحي ابو صالح	الطرق الاحصائية		2009	دار البازوري	Book	1
6	Prem S. Mann	Introductory Statistics		2004	John Wiley Sons. INC	Book	1
7	Daniel S. Wilks	Statistical Methods in the Atmospheric Sciences	2	2006	Elsevier	Book	4
8	صالح رشيد بطارسة	الإحصاء والاحتمالات	1	2009	دار اسامة	Book	1
9	Arnold Naiman, Robert Rosenfeld and Gene Zirkel	Understanding Statistics	3	1983	McGraw-Hill, Inc	Book	1
10	عادل احمد هدي	نظرية القرار الاحصائية	1	1992	جامعة الموصل - كلية الادارة والاقتصاد	Book	1

Figure 8. Report form

In the following tables, the various important objects' properties were given. This will be useful to follow the code that will be given later.

Table 1. The main properties of the objects in Welcome form

Welcome Form (See Figure 1)			
Object	Property	Value	Notes
Start button	Name	btnEnter	
	Text	Start	
Welcome Form	Name	frmWelcome	
	Text	Welcome to Department of Atmospheric Sciences Library...	
	AcceptButton	btnEnter	
Librarian Zone button	Name	Button1	
	Text	Librarian Zone	
Exit button	Name	btnExit	
	Text		
About button	Name	btnAbout	
	Text		

Table 2. The main properties of the objects in Search form

Search Form (See Figure 3)			
Object	Property	Value	Notes
Search Form	Name	frmSearch	
	Text	Search Library	
Combobox Search options	Name	cmbSearch	
	Text		
	Items	Collection	
Search Textbox	Name	txtSearch	
	Text		
	Items	Collection	
Find button	Name	btnFind	
	Text	Find	
Hind button	Name	btnHint	
	Text	Hint	
	Name	lstResults	
	Text		
	DataSource	BooksBindingSource	
ID Textbox	Name	IDTextBox	
	Text	BooksBindingSource-ID	
	ReadOnly	True	
Author Textbox	Name	AuthorTextBox	
	Text	BooksBindingSource-Author	
	ReadOnly	True	
Title Textbox	Name	TitleTextBox	
	Text	BooksBindingSource- Title	
	ReadOnly	True	
Publisher Textbox	Name	PublisherTextBox	
	Text	BooksBindingSource- Publisher	
	ReadOnly	True	
Eddition Textbox	Name	EdditionTextBox	
	Text	BooksBindingSource- Eddition	
	ReadOnly	True	
Type Textbox	Name	TypeTextBox	
	Text	BooksBindingSource- Type	
	ReadOnly	True	
Year Textbox	Name	YearTextBox	
	Text	BooksBindingSource- Year	
	ReadOnly	True	
Country Textbox	Name	CountryTextBox	
	Text	BooksBindingSource- Country	
	ReadOnly	True	
Language Textbox	Name	LanguageTextBox	
	Text	BooksBindingSource- Language	
	ReadOnly	True	
Subject Textbox	Name	SubjectTextBox	
	Text	BooksBindingSource- Subject	
	ReadOnly	True	

Pages Total Textbox	Name	Pages_TotalTextBox	
	Text	BooksBindingSource- Pages_Total	
	ReadOnly	True	
Book SN Textbox	Name	BooksSNTextBox	
	Text	BooksBindingSource- BookSN	
	ReadOnly	True	
Locker Number Textbox	Name	LockerTextBox	
	Text	BooksBindingSource- Locker	
	ReadOnly	True	
Book No Textbox	Name	BookNOTextBox	
	Text	BooksBindingSource- BookNo	
	ReadOnly	True	
Book No Textbox	Name	TotalTextBox	
	Text	BooksBindingSource- Total	
	ReadOnly	True	
Notes No Textbox	Name	NotesTextBox	
	Text	BooksBindingSource- Notes	
	ReadOnly	True	
Back button	Name	btnHome	
	Text	Back	
Filter by Language Group box	Name	grbLang	
	Text	Filter by Language	
Arabic Lang. Radio button	Name	radAr	
	Text	الكتب والاطاريح العربية	
English Lang. Radio button	Name	radEn	
	Text	English Books and Theses	
Filter by Type Group box	Name	GroupBox1	
	Text	Filter by type	
All books Radio button	Name	radAll	Display all books and Theses
	Text	All	
All books Radio button	Name	radBook	Display books only
	Text	All	
All books Radio button	Name	radMSC	Display Theses only
	Text	All	
Link with data of access objects	DataSetName	LibraryDataSet	
	Name	BooksBindingSource	
	DataMember	Books	
	DataSource	LibraryDataSet	
	Name	BooksTableAdapter	
	Name	TableAdapterManager	
	BooksTableAdapter	BooksTableAdapter	
	Name	BooksBindingNavigator	
	PositionItem	BindingNavigatorPositionItem	

Table 3. The main properties of the objects in Log In form

Log In Form (See Figure 6)			
Object	Property	Value	Notes
Librarian Login Form	Name	frmLibrarianBack	
	Text	Librarian Login	
	AcceptButton	btnLogIn	
User Name Textbox	Name	txtUserLib	
	Text		
Password Textbox	Name	txtPasswordLib	
	Text		
Log In button	Name	btnLogIn	
	Text	Log In	
Change Accounts button	Name	btnChange	
	Text	Change Accounts	
Back button	Name	btnBack	
	Text	Back	
Exit button	Name	btnLogInExit	
	Text	Exit	

Table 4. The main properties of the objects in Library Management form

Library Management Form (See Figure 7)			
Object	Property	Value	Notes
Librarian Management Form	Name	frmLibraryManagement	
	Text	Library Management	
Data Grid View	Name	BooksDataGridView	
	Text		
	DataSource	BooksBindingSource	
	Columns	Collection	
Move First button	Name	btnMoveFirst	
	Text		Image
Move Previous button	Name	btnMovePrevious	
	Text		Image
Add First button	Name	btnAddItem	
	Text		Image
Delete button	Name	btnDeleteItem	
	Text		Image
Save button	Name	btnSaveItem	
	Text		Image
Move Next button	Name	btnMoveNext	
	Text		Image
Move End button	Name	btnMoveEnd	
	Text		Image
Search Textbox	Name	txtSearch	
	Text		
Start Search button	Name	btnSearchDGV	
	Text	Start Search	
Reset Me button	Name	btnResetMe	
	Text	Reset Me	
Sort Authors Alphabetically	Name	Button1	
	Text	Sort Authors Alphabetically	
Back button	Name	btnBack	
	Text	Back	
Exit button	Name	btnExit	
	Text	Exit	
Total Books in Library button	Name	Total Books in Library	
	Text	btnTotal	
Total Textbox	Name	txtTotal	
	Text		
Report button	Name	btnOpenReport	
	Text	Report	
DataSet	Name	LibraryDataSet	
	DataSetName	LibraryDataSet	
Books Binding Source	Name	BooksBindingSource	
	DataMember	Books	
	DataSource	LibraryDataSet	
Books Table Adapter	Name	BookTableAdapter	
Table Adapter Manager	Name	TableAdapterManager	
	BooksTableAdapter	BooksTableAdapter	
Books Binding Navigator	Name	BooksBindingNavigator	
	Text	BindingNavigator1	
	AddNewItem	BindingNavigatorPositionItem	
	BindingSource	BooksBindingSource	
	CountItem	BindingNavigatorCountItem	
	DeleteItem	BindingNavigatorDeleteItem	
	Items	Collection	
	MoveFirstItem	BindingNavigatorMoveFirstItem	
	MoveLastItem	BindingNavigatorMoveLastItem	
	MoveNextItem	BindingNavigatorMoveNextItem	
	MovePreviousItem	BindingNavigatorMovePreviousItem	
	PositionItem	BindingNavigatorPositionItem	

Table 5. The main properties of the objects in Report form

Report Form (See Figure 8)			
Object	Property	Value	Notes
Search Textbox	Name	txtSearch	
	Text		
Search button	Name	btnSearch	
	Text	Search	
	Name	Library_Database	
	DataSetName	Library_Database	
	Name	BooksBindingSource	
	DataMember	Books	
	DataSource	Library_Database	
	Name	BooksTableAdapter	

Now we get the codes of the important forms (windows):

Welcome Form Code (See Figure 1)

```
Public Class frmWelcome
    '////////////////////////////////////
    ' This is The epartment of Atmospheric Sciences' Library Management System (AtmoLib)
    ' It was developed by Dr. Thaer Obaid Roomi in 2019
    '////////////////////////////////////
    Private Sub btnExit_Click(sender As Object, e As EventArgs) Handles btnExit.Click
        End
    End Sub
    Private Sub btnAbout_Click(sender As Object, e As EventArgs) Handles btnAbout.Click
        frmAbout.Show()
    End Sub
    Private Sub btnEnter_Click(sender As Object, e As EventArgs) Handles btnEnter.Click
        frmSearch.Show()
        Me.Hide()
    End Sub
    Private Sub Button1_Click(sender As Object, e As EventArgs) Handles Button1.Click
        frmLibrarianBack.Show()
        frmLibrarianBack.txtUserLib.Clear()
        frmLibrarianBack.txtPasswordLib.Clear()
    End Sub

    Private Sub frmWelcome_Load(sender As Object, e As EventArgs) Handles MyBase.Load

    End Sub
End Class
```

Search Form Code (See Figure 3)

```
Public Class frmSearch
    REM This program was written and developed by Dr Thaer Obaid Roomi in 2019
    Private Sub frmSearch_Load(sender As Object, e As EventArgs) Handles MyBase.Load
        'TODO: This line of code loads data into the 'LibraryDataSet.Books' table. You can move, or
        remove it, as needed.
        Me.BooksTableAdapter.Fill(Me.LibraryDataSet.Books)
        cmbSearch.Items.Add("Author")
        cmbSearch.Items.Add("Title")
        cmbSearch.Items.Add("Subject")
    End Sub
    Private Sub Button1_Click(sender As Object, e As EventArgs) Handles btnBorrow.Click
        ' The If statement is written to check if the user has chosen book/Thesis or not
```

```

    If (lstChosen.Items.Count = 0) Then
        MsgBox("Please choose one book/Thesis or more !", vbCritical, "Be careful !")
    Else
        frmRegister.Show()
    End If
End Sub
Private Sub BooksBindingNavigatorSaveItem_Click(sender As Object, e As EventArgs)
    Me.Validate()
    Me.BooksBindingSource.EndEdit()
    Me.TableAdapterManager.UpdateAll(Me.LibraryDataSet)
End Sub
Private Sub BooksBindingNavigatorSaveItem_Click_1(sender As Object, e As EventArgs)
    Me.Validate()
    Me.BooksBindingSource.EndEdit()
    Me.TableAdapterManager.UpdateAll(Me.LibraryDataSet)
End Sub
Private Sub BooksBindingNavigatorSaveItem_Click_2(sender As Object, e As EventArgs)
    Me.Validate()
    Me.BooksBindingSource.EndEdit()
    Me.TableAdapterManager.UpdateAll(Me.LibraryDataSet)
End Sub
Private Sub BooksBindingNavigatorSaveItem_Click_3(sender As Object, e As EventArgs) Handles
BooksBindingNavigatorSaveItem.Click
    Me.Validate()
    Me.BooksBindingSource.EndEdit()
    Me.TableAdapterManager.UpdateAll(Me.LibraryDataSet)
End Sub
Private Sub btnFind_Click(sender As Object, e As EventArgs) Handles btnFind.Click
    Dim Library As String
    'choosing search criteria from the combobox (cmbSearch)& assign the value to the string
variable (Library)
    Library = cmbSearch.Text
    Select Case Library
        Case "Author"
            Me.BooksBindingSource.Filter = " Author like '" & txtSearch.Text & "%'"
        Case "Title"
            Me.BooksBindingSource.Filter = " Title like '" & txtSearch.Text & "%'"
        Case "Subject"
            Me.BooksBindingSource.Filter = " Specification like '" & txtSearch.Text & "%'"
    End Select
    ' lstResults.DisplayMember.OrderByDescending
    ' Now this is innovative idea written by me to display search results according to the criteria
in the
    '      "cmbSearch" combobox. 5 October 2019 at 7:00 AM
    If cmbSearch.Text = "Author" Then
        lstResults.DisplayMember = "Author"
    ElseIf cmbSearch.Text = "Title" Then
        lstResults.DisplayMember = "Title"
    ElseIf cmbSearch.Text = "Subject" Then
        lstResults.DisplayMember = "Specification"
    End If
End Sub
Private Sub btnHome_Click(sender As Object, e As EventArgs) Handles btnHome.Click
    Me.Hide()
    frmWelcome.Show()
End Sub
Private Sub btnAdd_Click(sender As Object, e As EventArgs) Handles btnAdd.Click
    strAdd = TitleTextBox.Text
    strList = lstChosen.Items.Add(strAdd)
    strAdd2 = IDTextBox.Text
    strAdd3 = TotalTextBox.Text
    strList2 = lstID.Items.Add(strAdd2)
    ' The following two statements are to show Title, ID and Total for frmBorrow form
    frmBorrow.lstBorrow.Items.Add(strAdd)
    frmBorrow.lstIDBorrow.Items.Add(strAdd2)
    frmBorrow.lstBNBorrow.Items.Add(strAdd3)
    ' The following two statements are to show Title, ID and Total for frmBorrow form
    frmBorrowNew.lstBorrow2.Items.Add(strAdd)
    frmBorrowNew.lstIDBorrow2.Items.Add(strAdd2)

```

```

        frmBorrowNew.lstBNBorrow2.Items.Add(strAdd3)
    End Sub
    Private Sub txtSearch_KeyPress(ByVal sender As Object, ByVal e As
System.Windows.Forms.KeyPressEventArgs) Handles txtSearch.KeyPress
        If e.KeyChar = Microsoft.VisualBasic.ChrW(13) Then
            Me.btnFind.Focus()
        End If
    End Sub
    Private Sub Button1_Click_1(sender As Object, e As EventArgs) Handles Button1.Click
        Dim strRemove As String
        Dim StrIDRemove As String
        strRemove = lstChosen.Text
        StrIDRemove = lstID.Text

        lstChosen.Items.Remove(strRemove)
        lstID.Items.Remove(StrIDRemove)
    End Sub
    Private Sub btnTest_Click(sender As Object, e As EventArgs)
    End Sub
    Private Sub txtSearch_TextChanged(sender As Object, e As EventArgs) Handles txtSearch.TextChanged
    End Sub
    Private Sub radBook_CheckedChanged(sender As Object, e As EventArgs) Handles radBook.CheckedChanged
        Dim strBook As String = "Book"
        If (radBook.Checked) Then
            BooksBindingSource.Filter = "Type = '" & strBook & "'"
        End If
    End Sub
    Private Sub GroupBox1_Enter(sender As Object, e As EventArgs) Handles GroupBox1.Enter
    End Sub
    Private Sub radPHD_CheckedChanged(sender As Object, e As EventArgs) Handles radPHD.CheckedChanged
        Dim strThesisPHD As String = "PHD Thesis"
        If (radPHD.Checked) Then
            BooksBindingSource.Filter = "Type = '" & strThesisPHD & "'"
        End If
    End Sub
    Private Sub radMSC_CheckedChanged(sender As Object, e As EventArgs) Handles radMSC.CheckedChanged
        Dim strThesisMSC As String = "MSC Thesis"
        If (radMSC.Checked) Then
            BooksBindingSource.Filter = "Type Like '" & strThesisMSC & "'"
        End If
    End Sub
    Private Sub txtCount_TextChanged(sender As Object, e As EventArgs)
    End Sub
    Private Sub txtTest_TextChanged(sender As Object, e As EventArgs)
    End Sub
    Private Sub radAll_CheckedChanged(sender As Object, e As EventArgs) Handles radAll.CheckedChanged
        ' This private sub is to choose the items upon their type (All, Books, MSC Theses and PHD
Theses)
        Dim strBook As String = "Book"
        Dim strThesisPHD As String = "PHD Thesis"
        Dim strThesisMSC As String = "MSC Thesis"
        If (radBook.Checked) Then
            BooksBindingSource.Filter = "Type = '" & strBook & "'"
        ElseIf (radPHD.Checked) Then
            BooksBindingSource.Filter = "Type = '" & strThesisPHD & "'"
        ElseIf (radMSC.Checked) Then
            BooksBindingSource.Filter = "Type Like '" & strThesisMSC & "'"
        ElseIf (radAll.Checked) Then
            BooksBindingSource.Filter = True 'This statement is to display all items
        End If
    End Sub
    Private Sub BindingNavigatorCountItem_Click(sender As Object, e As EventArgs) Handles
BindingNavigatorCountItem.Click
    End Sub
    Private Sub BooksBindingNavigator_RefreshItems(sender As Object, e As EventArgs) Handles
BooksBindingNavigator.RefreshItems
    End Sub

```

```

Private Sub BindingNavigatorAddNewItem_Click(sender As Object, e As EventArgs) Handles
BindingNavigatorAddNewItem.Click
End Sub
Private Sub radAr_CheckedChanged(sender As Object, e As EventArgs) Handles radAr.CheckedChanged
Dim strAr As String = "Ar"
If (radAr.Checked) Then
BooksBindingSource.Filter = "Language = '" & strAr & "'"
End If
End Sub
Private Sub radEn_CheckedChanged(sender As Object, e As EventArgs) Handles radEn.CheckedChanged
Dim strEn As String = "En"
If (radEn.Checked) Then
BooksBindingSource.Filter = "Language = '" & strEn & "'"
End If
End Sub
Private Sub btnHint_Click(sender As Object, e As EventArgs) Handles btnHint.Click
MsgBox("Write * before the keyword to start search from the second word", vbOKOnly, "Hint")
End Sub
Private Sub Button2_Click(sender As Object, e As EventArgs)
frmBorrowNew.Show()
End Sub
End Class

```

Log In Form Code (See Figure 6)

```

Public Class frmLibrarianBack
Public strUserLib As String
Public strPasswordLib As String
Public strUserAdmin As String
Public strPasswordAdmin As String
Private Sub btnLogIn_Click(sender As Object, e As EventArgs) Handles btnLogIn.Click
' This is to set the usernames and passwords
' the originally user and password are " admin" and "admin0000", respectively for Librarian.
strUserLib = "lib"
strPasswordLib = "lib0000"
' strUserAdmin = "admin"
' strPasswordAdmin = "admin0000"
If txtUserLib.Text = strUserLib And txtPasswordLib.Text = strPasswordLib Then ' And
txtUserAdmin.Text = strUserAdmin And txtPasswordAdmin.Text = strPasswordAdmin Then
frmLibraryManagement.Show()
Me.Hide()
Else
MsgBox("Sorry! Try again ")
End If
End Sub
Private Sub Button2_Click(sender As Object, e As EventArgs) Handles btnChange.Click
frmLibraianNewAccount.Show()
End Sub
Private Sub btnLogInExit_Click(sender As Object, e As EventArgs) Handles btnLogInExit.Click
End
End Sub
Private Sub Button1_Click(sender As Object, e As EventArgs) Handles btnBack.Click
frmWelcome.Show()
Me.Close()
txtUserLib.Select()
End Sub
Private Sub frmLibrarianBack_Load(sender As Object, e As EventArgs) Handles MyBase.Load
txtUserLib.Focus()
End Sub
End Class

```

Librarian Management Form Code (See Figure 7)

```

Public Class frmLibraryManagement
    Private Sub BooksBindingNavigatorSaveItem_Click(sender As Object, e As EventArgs) Handles
BooksBindingNavigatorSaveItem.Click
        Me.Validate()
        Me.BooksBindingSource.EndEdit()
        Me.TableAdapterManager.UpdateAll(Me.LibraryDataSet)
    End Sub
    Private Sub frmLibraryManagement_Load(sender As Object, e As EventArgs) Handles MyBase.Load
        'TODO: This line of code loads data into the 'LibraryDataSet.Books' table. You can move, or
remove it, as needed.
        Me.BooksTableAdapter.Fill(Me.LibraryDataSet.Books)
        ' The following two statements are to color the BooksDataGridview in alternating pattern
        BooksDataGridview.RowsDefaultCellStyle.BackColor = Color.LightCyan
        BooksDataGridview.AlternatingRowsDefaultCellStyle.BackColor = Color.White

        With BooksDataGridview
            .Columns(4).HeaderText = "Year"
            .Columns(10).HeaderText = "Book no."
            .Columns(12).HeaderText = "Book SN"
        End With
    End Sub
    Private Sub Button1_Click(sender As Object, e As EventArgs) Handles btnBack.Click
        Me.Close()
        ' txtTotal.Clear()
    End Sub
    Private Sub BindingNavigatorMoveFirstItem_Click(sender As Object, e As EventArgs) Handles
BindingNavigatorMoveFirstItem.Click
    End Sub
    Private Sub Button10_Click(sender As Object, e As EventArgs) Handles btnMoveFirst.Click
        BooksBindingSource.MoveFirst()
    End Sub
    Private Sub BindingNavigatorCountItem_Click(sender As Object, e As EventArgs) Handles
BindingNavigatorCountItem.Click
    End Sub
    Private Sub BindingNavigatorPositionItem_Click(sender As Object, e As EventArgs) Handles
BindingNavigatorPositionItem.Click
    End Sub
    Private Sub btnMovePrevious_Click(sender As Object, e As EventArgs) Handles btnMovePrevious.Click
        BooksBindingSource.MovePrevious()
    End Sub
    Private Sub btnMoveNext_Click(sender As Object, e As EventArgs) Handles btnMoveNext.Click
        BooksBindingSource.MoveNext()
    End Sub
    Private Sub btnAddItem_Click(sender As Object, e As EventArgs) Handles btnAddItem.Click
        BooksBindingSource.AddNew()
    End Sub
    Private Sub btnDeleteItem_Click(sender As Object, e As EventArgs) Handles btnDeleteItem.Click
        BooksBindingSource.RemoveCurrent()
    End Sub
    Private Sub BindingNavigatorDeleteItem_Click(sender As Object, e As EventArgs) Handles
BindingNavigatorDeleteItem.Click
    End Sub
    Private Sub btnSaveItem_Click(sender As Object, e As EventArgs) Handles btnSaveItem.Click
        Try
            BooksBindingSource.EndEdit()
            TableAdapterManager.UpdateAll(LibraryDataSet)
            MsgBox("Save completed")
        Catch ex As Exception
            MsgBox("error occurred, please recheck the fields and try again")
        End Try
    End Sub
    Private Sub btnMoveEnd_Click(sender As Object, e As EventArgs) Handles btnMoveEnd.Click
        BooksBindingSource.MoveLast()
    End Sub
    Private Sub btnExit_Click(sender As Object, e As EventArgs) Handles btnExit.Click
        End
    End Sub
End Class

```

```

Private Sub bntTotal_Click(sender As Object, e As EventArgs) Handles bntTotal.Click
    ' This statements is to check whether the total number is null
    Try
        For Each row As DataGridViewRow In BooksDataGridView.Rows
            If row.Cells(11).Value Is Nothing Then
                ' MsgBox("Please fill the total number cell")
            Else
                BooksBindingSource.Filter = True
                ' The following statements are to get the total number of items (books/theses) by summing
                ' up the number of these items in Total column (column no. 11):
                Dim sum As Integer = 0
                For i As Integer = 0 To BooksDataGridView.Rows.Count() - 1 Step +1
                    sum = sum + BooksDataGridView.Rows(i).Cells(11).Value
                Next
                txtTotal.Text = sum.ToString()
            End If
        Next
    Catch ex As Exception
        MsgBox("Please fill the cell of total number", vbOK, "Missing Information")
    End Try
End Sub
Private Sub TextBox1_TextChanged(sender As Object, e As EventArgs) Handles txtTime.TextChanged
End Sub
Private Sub Timer1_Tick(sender As Object, e As EventArgs) Handles Timer1.Tick
    txtTime.Text = Format(Now, "dd / MM / yyyy   hh: mm:ss")
End Sub
Private Sub Button1_Click_2(ByVal sender As Object, ByVal e As EventArgs) Handles
btnSearchDGV.Click
    On Error GoTo SearchErr
    If txtSearch.Text = "" Then
        ' Call notFound()
        Exit Sub
    Else
        Dim CantFind As String = txtSearch.Text
        BooksBindingSource.Filter = "(Author Like'" & txtSearch.Text & "%') &
            "OR(Title Like '%" & txtSearch.Text & "%')"
        If BooksBindingSource.Count <> 0 Then
            With BooksDataGridView
                .DataSource = BooksBindingSource
            End With
        Else
            ' Me.notFound()
            MsgBox(" ---> " & CantFind & vbNewLine & " The search item was not found",
MsgBoxStyle.Information, "Hey Boss!")
            BooksBindingSource.Filter = Nothing
            With BooksDataGridView
                .ClearSelection()
                .ReadOnly = False
                .MultiSelect = False
                .DataSource = BooksBindingSource
            End With
        End If
    End If
ErrExit:
    Exit Sub
SearchErr:
    MsgBox("Error Number")
    'MsgBox("Error Number" & Err.Number & vbNewLine & "Error Description" & Err.Description,
MsgBoxStyle.Critical, "Reset Error !")
    Resume ErrExit
End Sub
Private Sub BindingNavigatorMoveNextItem_Click(sender As Object, e As EventArgs) Handles
BindingNavigatorMoveNextItem.Click
End Sub
Private Sub BooksBindingNavigator_RefreshItems(sender As Object, e As EventArgs) Handles
BooksBindingNavigator.RefreshItems
End Sub

```

```

Private Sub Button1_Click_1(sender As Object, e As EventArgs) Handles Button1.Click
    ' This sub is to sort "Author" field in alphabetic ascending order.
    Try
        Me.BooksTableAdapter.SortAuthors(Me.LibraryDataSet.Books)
    Catch ex As System.Exception
        System.Windows.Forms.MessageBox.Show(ex.Message)
    End Try
End Sub
Private Sub SortAuthorsToolStripButton_Click(sender As Object, e As EventArgs) Handles
SortAuthorsToolStripButton.Click
    Try
        Me.BooksTableAdapter.SortAuthors(Me.LibraryDataSet.Books)
    Catch ex As System.Exception
        System.Windows.Forms.MessageBox.Show(ex.Message)
    End Try
End Sub
Private Sub btnResetMe_Click(sender As Object, e As EventArgs) Handles btnResetMe.Click
    '- to reset the filtering and showing all
    BooksBindingSource.Filter = Nothing
End Sub
Private Sub btnOpenReport_Click(sender As Object, e As EventArgs) Handles btnOpenReport.Click
    Dim f As New frmLibraryReport
    f.TopMost = True
    f.Show()
End Sub
End Class

```

Report Form Code (See Figure 8)

```

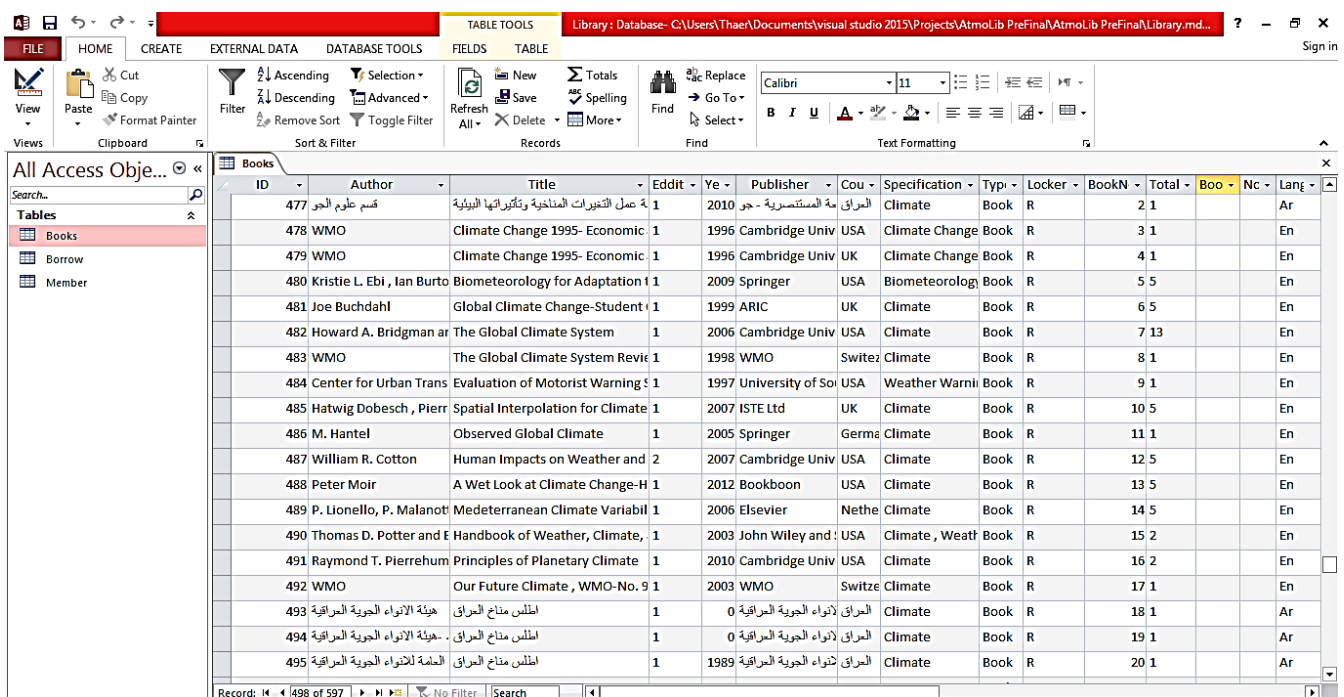
Public Class frmLibraryReport
    Private Sub frmLibraryReport_Load(sender As Object, e As EventArgs) Handles MyBase.Load
        'TODO: This line of code loads data into the 'Library_Database.Books' table. You can move, or
        remove it, as needed.
        Me.BooksTableAdapter.Fill(Me.Library_Database.Books)
        Me.ReportViewer1.RefreshReport()
        ' I have learned from the following youtubes:
        ' https://www.youtube.com/watch?v=SaPpGc2hcp8
        'https://www.youtube.com/watch?v=XhV9Ik3ziG8
        'https://www.youtube.com/watch?v=UoT2oava9ns&feature=youtu.be
        'https://www.youtube.com/watch?v=e5DvkW7moWg
    End Sub
    Private Sub btnSearch_Click(sender As Object, e As EventArgs) Handles btnSearch.Click
        Try
            If Not String.IsNullOrEmpty(txtSearch.Text) Then
                Dim keyword As String = Me.txtSearch.Text.Trim()
                ' Trim() is used to remove the spaces before and after... look for LTrim and RTrim
                Me.BooksBindingSource.Filter =
                    "(Author Like '%" & keyword & "%') " &
                    "OR (Title Like '%" & keyword & "%') " &
                    ' "OR (Type Like '%" & keyword & "%') " &
                    '"OR (YearP Like '%" & keyword & "%') "
                Me.ReportViewer1.RefreshReport()
            Else
                Me.BooksBindingSource.RemoveFilter()
                frmLibraryReport_Load(sender, e)
            End If
        Catch ex As Exception
            MessageBox.Show("Error: " + ex.Message.ToString(),
                " Error Handler - Code a minute.",
                MessageBoxButtons.OK, MessageBoxIcon.Information)
        Finally
            Me.txtSearch.Text = Focus()
        End Try
    End Sub
End Class

```


Finally... The database !!

The Database

The application uses the database “Library.mdb” was created by Microsoft Access File (See Figure 9)



ID	Author	Title	Eddit	Ye	Publisher	Cou	Specification	Typ	Locker	BookN	Total	Boo	Nc	Lang
477	قسم علوم الجو	عمل التغيرات المناخية وتأثيراتها البيئية	1	2010	المعالم الممكتمة - جو	العراق	Climate	Book	R	2	1			Ar
478	WMO	Climate Change 1995- Economic	1	1996	Cambridge Univ	USA	Climate Change	Book	R	3	1			En
479	WMO	Climate Change 1995- Economic	1	1996	Cambridge Univ	UK	Climate Change	Book	R	4	1			En
480	Kristie L. Ebi , Ian Burto	Biometeorology for Adaptation	1	2009	Springer	USA	Biometeorology	Book	R	5	5			En
481	Joe Buchdahl	Global Climate Change-Student	1	1999	ARIC	UK	Climate	Book	R	6	5			En
482	Howard A. Bridgman ar	The Global Climate System	1	2006	Cambridge Univ	USA	Climate	Book	R	7	13			En
483	WMO	The Global Climate System Revie	1	1998	WMO	Switze	Climate	Book	R	8	1			En
484	Center for Urban Trans	Evaluation of Motorist Warning	1	1997	University of So	USA	Weather Warni	Book	R	9	1			En
485	Hatwig Dobesch , Pierr	Spatial Interpolation for Climate	1	2007	ISTE Ltd	UK	Climate	Book	R	10	5			En
486	M. Hantel	Observed Global Climate	1	2005	Springer	Germa	Climate	Book	R	11	1			En
487	William R. Cotton	Human Impacts on Weather and	2	2007	Cambridge Univ	USA	Climate	Book	R	12	5			En
488	Peter Moir	A Wet Look at Climate Change-H	1	2012	Bookboon	USA	Climate	Book	R	13	5			En
489	P. Lionello, P. Malanot	Medeterranean Climate Variabil	1	2006	Elsevier	Nethe	Climate	Book	R	14	5			En
490	Thomas D. Potter and E	Handbook of Weather, Climate,	1	2003	John Wiley and	USA	Climate , Weatr	Book	R	15	2			En
491	Raymond T. Pierrehum	Principles of Planetary Climate	1	2010	Cambridge Univ	USA	Climate	Book	R	16	2			En
492	WMO	Our Future Climate , WMO-No. 9	1	2003	WMO	Switze	Climate	Book	R	17	1			En
493	هيئة الانواء الجوية العراقية	املن مناخ العراق	1	0	لائواء الجوية العراقية	العراق	Climate	Book	R	18	1			Ar
494	هيئة الانواء الجوية العراقية	املن مناخ العراق	1	0	لائواء الجوية العراقية	العراق	Climate	Book	R	19	1			Ar
495	العلماء للائواء الجوية العراقية	املن مناخ العراق	1	1989	لائواء الجوية العراقية	العراق	Climate	Book	R	20	1			Ar

Figure 9. Part of the database file

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or send me a message via Researchgate account

https://www.researchgate.net/profile/Thaer-Roomi-2?ev=hdr_xprf

Regards

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