

**2014**



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|----------------|--------------------------|
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# 1. INTRODUCTION

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## 1.1 library's background

Knowledge Planet Library is a library of “Knowledge Planet Academy”, a private learning center founded in the year 2004 and is located in Yangon, Myanmar. The library was officially opened in the year 2005 for the purpose of getting more references, knowledge and information for the students of this school. The library was rather a small one when it was founded. Now, over the past 9 years, the size of the library is getting bigger because the library's officials have been buying many new kinds of books to become a better library and the students' knowledge center point.

## 1.2 current system and problem background

Since the library was founded, the staffs have been doing all the works manually. That is, the librarians have to record everyday transactions manually on the paper-based system. He or she has to write down every detail in the books daily. It's really a time consuming and data inconsistency is also very high. Below are the problems that current system is facing with.

**Slow Retrieval of Data** - The information is stored in different parts of the site and it may take a long time to retrieve or update the data. Sometimes, it can take up to 15 or 20 minutes finding the relevant information.

**Paper Wastage** - Much paper is waste due to the number of records daily and number of library members. Duplication of data can be occurred by repeating the same thing over and over.

**Unproductive use of storage space** - Paper takes up a massive amount of room in the site.

**Poor Customer Service** - Sometimes, the information may be unavailable.

**No reliable database system** - The records on paper can be lost or damaged at any time. Since there is no backup for the data, the lost or damaged documents cannot be regained at all.

**No security system** – Writing on paper is totally lack of security system. Any unauthorized person may see, update or even the data can be stolen.

These are the weak points that the current system is facing with.

### **1.3 objectives**

The main purpose of the new system is to handle all the problems that the old system is currently facing with. With the newly implemented system, the records can be easily created. There will be no duplication of data records because all the data records are controlled by a primary key called ID. There is also an error checking method to detect the data type error (e.g. the record cannot be stored when user types the alphabet character for the maximum loan items, a numeric value must be typed in). For retrieval of the records, it is much faster and easier than the previous system. Editing and deleting also can be easily and quickly performed. The records are to be stored in the security enabled database system which can store many lines of data records. There will be no store room at all to store the documents and no paper wastage at all. So, all the current problems will be solved with this single “Library Management System”. The staff will only need to sit at the workstation just to perform all these tasks.

These are the advantages of the new “Library Management System”.

## **1.4 requirement specifications of new system**

For best performance, these are the requirements for the system:

### **1.4.1 hardware**

Intel(R) Core™ i5 3230M CPU @ 2.60 GHz

3GB RAM or higher

20GB of HDD

USB Hub

LED Monitor with Standard Keyboard and Mouse

### **1.4.2 software**

Windows 7 OS

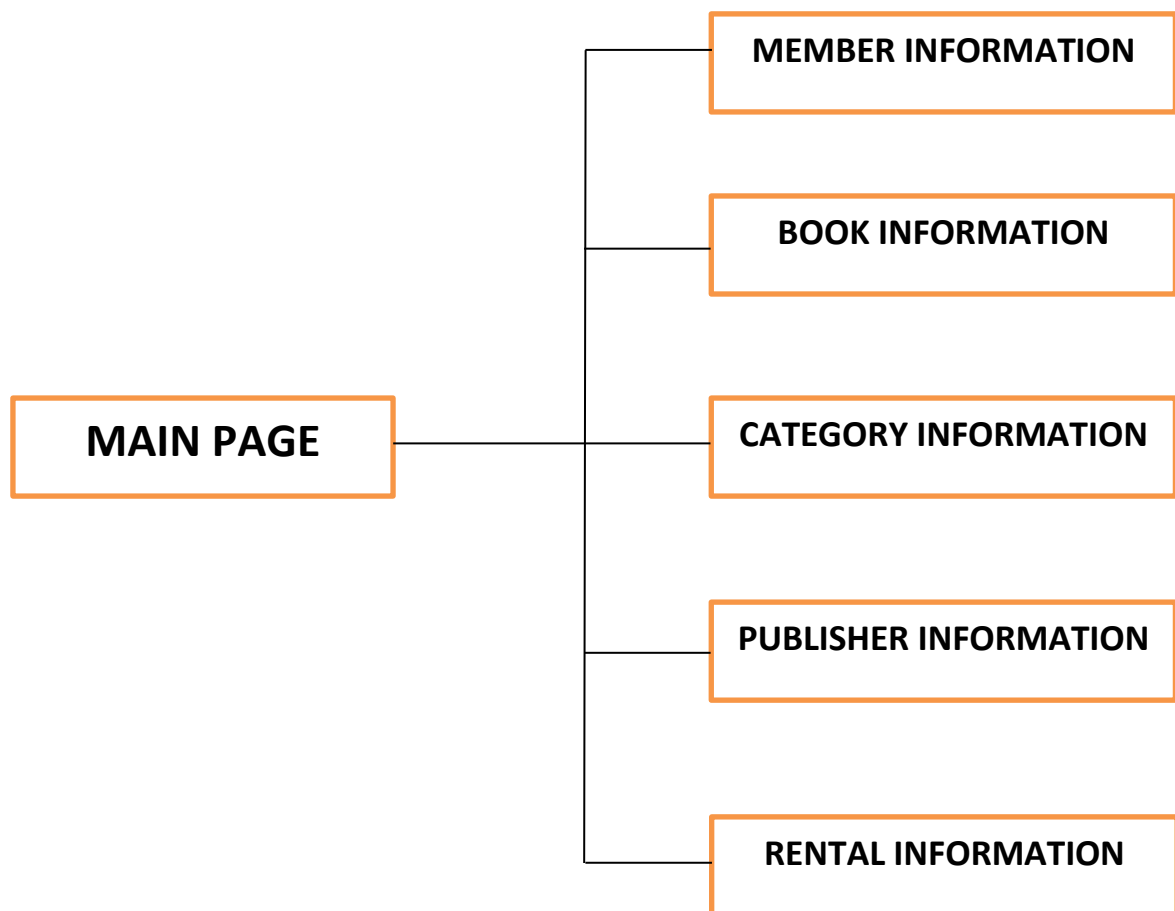
Microsoft Access 2007

Microsoft Visual Studio.Net 2010

## 2. DESIGN

---

### 2.1 structure chart



## 2.2 input screen layouts

frm\_main.vb

The screenshot displays a Windows form titled 'frm\_main.vb'. At the top, there is a menu bar with a single item labeled 'mnu\_file'. The main area of the form is white. In the center, there are two rectangular labels stacked vertically. The top label is labeled 'lbl\_library\_name' and the bottom label is labeled 'lbl\_library'.

| Field      | Description               | Type     | Name (ID)        |
|------------|---------------------------|----------|------------------|
| MenuStrip1 | File                      | Menu Bar | mnu_file         |
| Label1     | Knowledge Planet          | Label    | lbl_library_name |
| Label2     | Library Management System | Label    | lbl_library      |



## frm\_member.vb

The form layout for `frm_member.vb` is as follows:

- gb\_member** (Group Box)
  - lbl\_mem\_id** (Label) and **txt\_mem\_id** (Text Box)
  - lbl\_mem\_name** (Label) and **txt\_mem\_name** (Text Box)
  - lbl\_ic** (Label) and **txt\_ic** (Text Box)
  - lbl\_addr** (Label) and **txt\_addr** (Text Box)
  - lbl\_phone** (Label) and **txt\_phone** (Text Box)
  - lbl\_reg\_date** (Label) and **dt\_reg\_date** (Date Time Picker)
  - lbl\_exp\_date** (Label) and **dt\_exp\_date** (Date Time Picker)
  - lbl\_max\_items** (Label) and **txt\_max\_items** (Text Box)
- btn\_add** (Button) and **btn\_update** (Button)
- btn\_show\_all** (Button) and **btn\_delete** (Button)
- btn\_save** (Button) and **btn\_cancel** (Button)
- dg\_member** (DataGridView)
- btn\_back\_to\_main** (Button)

| Field      | Description                | Type             | Name (ID)     |
|------------|----------------------------|------------------|---------------|
| Group Box1 | Group-Member Information   | group box        | gb_member     |
| Label1     | Label - Member ID          | label            | lbl_mem_id    |
| Label2     | Label - Member Name        | Label            | lbl_mem_name  |
| Label3     | Label - IC No:             | label            | lbl_ic        |
| Label4     | Label - Address            | label            | lbl_addr      |
| Label5     | Label - Phone              | label            | lbl_phone     |
| Label6     | Label - Registration Date  | label            | lbl_reg_date  |
| Label7     | Label - Expiry Date        | label            | lbl_exp_date  |
| Label8     | Label - Maximum Items      | label            | lbl_max_items |
| Text Box1  | Insert – Member ID         | Text             | txt_mem_id    |
| Text Box2  | Insert – Member Name       | Text             | txt_mem_name  |
| Text Box3  | Insert – IC No:            | Text             | txt_ic        |
| Text Box4  | Insert – Address           | Text             | txt_addr      |
| Text Box5  | Insert – Phone             | Text             | txt_phone     |
| dt_Picker1 | Insert – Registration Date | date time Picker | dt_reg_date   |

|            |                          |                  |                  |
|------------|--------------------------|------------------|------------------|
| dt_Picker2 | Insert – Expiry Date     | date time Picker | dt_exp_date      |
| Text Box6  | Insert – Maximum Items   | Text             | txt_max_items    |
| Data Grid1 | Display all the data     | Data Grid        | dg_member        |
| Button1    | To add record            | Command Button   | btn_add          |
| Button2    | To update record         | Command Button   | btn_update       |
| Button3    | To delete record         | Command Button   | btn_delete       |
| Button4    | To save changes          | Command Button   | btn_save         |
| Button5    | To cancel action         | Command Button   | btn_cancel       |
| Button6    | To show all data in grid | Command Button   | btn_show_all     |
| Button7    | To go back to main form  | Command Button   | btn_back_to_main |

frm\_book.vb

The form layout for `frm_book.vb` is as follows:

- gb\_book** (Group Box):
  - Labels: `lbl_b_id`, `lbl_title`, `lbl_author`, `lbl_desc`, `lbl_cat_id`, `lbl_pub_id`, `lbl_isbn`, `lbl_price`, `lbl_pdate`.
  - Text Boxes: `txt_b_id`, `txt_title`, `txt_author`, `txt_desc`, `txt_isbn`, `txt_price`.
  - ComboBoxes: `cbo_cat_id`, `cbo_pub_id`.
  - Date Picker: `dt_pdate`.
- Buttons** (located to the right of the group box):
  - `btn_add`, `btn_update`, `btn_show_all`, `btn_delete`, `btn_save`, `btn_cancel`.
- dg\_book** (Data Grid): A single data grid at the bottom of the form.
- btn\_back\_to\_main** (Button): A button at the bottom right of the form.

| Field      | Description               | Type             | Name (ID)        |
|------------|---------------------------|------------------|------------------|
| Group Box1 | Group - Book Information  | group box        | gb_book          |
| Label1     | Label - Book ID           | label            | lbl_b_id         |
| Label2     | Label - Title             | Label            | lbl_title        |
| Label3     | Label - Author's Name     | label            | lbl_author       |
| Label4     | Label – Description       | label            | lbl_desc         |
| Label5     | Label - Category ID       | label            | lbl_cat_id       |
| Label6     | Label – Publisher ID      | label            | lbl_pub_id       |
| Label7     | Label – ISBN              | label            | lbl_isbn         |
| Label8     | Label - Purchasing Price  | label            | lbl_price        |
| Label9     | Label – Purchasing Date   | label            | lbl_pdate        |
| Text Box1  | Insert – Book ID          | Text             | txt_b_id         |
| Text Box2  | Insert – Title            | Text             | txt_title        |
| Text Box3  | Insert – Author's Name    | Text             | txt_author       |
| Text Box4  | Insert – Description      | Text             | txt_desp         |
| Combo Box1 | Insert – Category ID      | Combo Box        | cbo_cat_id       |
| Combo Box2 | Insert – Publisher ID     | Combo Box        | cbo_pub_id       |
| Text Box5  | Insert – ISBN             | Text             | txt_isbn         |
| Text Box6  | Insert – Purchasing Price | Text             | txt_price        |
| dt_Picker1 | Insert – Purchasing Date  | Date time Picker | dt_pdate         |
| Data Grid1 | Display all the data      | Data Grid        | dg_book          |
| Button1    | To add record             | Command Button   | btn_add          |
| Button2    | To update record          | Command Button   | btn_update       |
| Button3    | To delete record          | Command Button   | btn_delete       |
| Button4    | To save changes           | Command Button   | btn_save         |
| Button5    | To cancel action          | Command Button   | btn_cancel       |
| Button6    | To show all data in grid  | Command Button   | btn_show_all     |
| Button7    | To go back to main form   | Command Button   | btn_back_to_main |

## frm\_category.vb

The form layout for `frm_category.vb` is as follows:

- gb\_category** (Group Box)
  - lbl\_cat\_id** (Label) and **txt\_cat\_id** (Text Box)
  - lbl\_cat\_name** (Label) and **txt\_cat\_name** (Text Box)
- Buttons** (Command Buttons):
  - btn\_add**, **btn\_update**, **btn\_show\_all**, **btn\_delete**, **btn\_save**, **btn\_cancel**
- dg\_category** (Data Grid)
- btn\_back\_to\_main** (Command Button)

| Field      | Description                  | Type           | Name (ID)        |
|------------|------------------------------|----------------|------------------|
| Group Box1 | Group - Category Information | group box      | gb_category      |
| Label1     | Label – Category ID          | label          | lbl_cat_id       |
| Label2     | Label - Category Name        | Label          | lbl_cat_name     |
| Text Box1  | Insert – Category ID         | Text           | txt_cat_id       |
| Text Box2  | Insert – Category Name       | Text           | txt_cat_name     |
| Data Grid1 | Display all the data         | Data Grid      | dg_category      |
| Button1    | To add record                | Command Button | btn_add          |
| Button2    | To update record             | Command Button | btn_update       |
| Button3    | To delete record             | Command Button | btn_delete       |
| Button4    | To save changes              | Command Button | btn_save         |
| Button5    | To cancel action             | Command Button | btn_cancel       |
| Button6    | To show all data in grid     | Command Button | btn_show_all     |
| Button7    | To go back to main form      | Command Button | btn_back_to_main |

frm\_publisher.vb

| Field      | Description                  | Type           | Name (ID)        |
|------------|------------------------------|----------------|------------------|
| Group Box1 | Group - Category Information | group box      | gb_publisher     |
| Label1     | Label – Publisher ID         | label          | lbl_pub_id       |
| Label2     | Label – Publisher Name       | Label          | lbl_pub_name     |
| Text Box1  | Insert – Publisher ID        | Text           | txt_pub_id       |
| Text Box2  | Insert – Publisher Name      | Text           | txt_pub_name     |
| Data Grid1 | Display all the data         | Data Grid      | dg_publisher     |
| Button1    | To add record                | Command Button | btn_add          |
| Button2    | To update record             | Command Button | btn_update       |
| Button3    | To delete record             | Command Button | btn_delete       |
| Button4    | To save changes              | Command Button | btn_save         |
| Button5    | To cancel action             | Command Button | btn_cancel       |
| Button6    | To show all data in grid     | Command Button | btn_show_all     |
| Button7    | To go back to main form      | Command Button | btn_back_to_main |

## frm\_transaction.vb

The form layout for `frm_transaction.vb` is as follows:

- gb\_tran** (Group Box) contains:
  - `lbl_tran_id` (Label) and `txt_tran_id` (Text Box)
  - `lbl_mem_id` (Label) and `cbo_mem_id` (Combo Box)
  - `lbl_b_id` (Label) and `cbo_b_id` (Combo Box)
  - `lbl_borrow_date` (Label) and `dt_borrow_date` (Date Time Picker)
  - `lbl_due_date` (Label) and `dt_due_date` (Date Time Picker)
  - `lbl_status` (Label) and `cbo_status` (Combo Box)
- Buttons: `btn_add`, `btn_update`, `btn_show_all`, `btn_delete`, `btn_save`, `btn_cancel`, and `btn_back_to_main`.
- `dg_tran` (Data Grid) for displaying data.

| Field      | Description              | Type             | Name (ID)       |
|------------|--------------------------|------------------|-----------------|
| Group Box1 | Group - Book Information | group box        | gb_tran         |
| Label1     | Label - Transaction ID   | label            | lbl_tran_id     |
| Label2     | Label – Member ID        | Label            | lbl_mem_id      |
| Label3     | Label – Book ID          | label            | lbl_b_id        |
| Label4     | Label – Borrow Date      | label            | lbl_borrow_date |
| Label5     | Label – Due Date         | label            | lbl_due_date    |
| Label6     | Label – Status           | label            | lbl_status      |
| Text Box1  | Insert – Transaction ID  | Text             | txt_tran_id     |
| Combo Box1 | Insert – Member ID       | Combo Box        | cbo_mem_id      |
| Combo Box2 | Insert – Book ID         | Combo Box        | cbo_b_id        |
| dt_Picker1 | Insert – Borrow Date     | Date time Picker | dt_borrow_date  |
| dt_Picker1 | Insert – Due Date        | Date time Picker | dt_due_date     |
| Combo Box2 | Insert – Status          | Combo Box        | cbo_status      |
| Data Grid1 | Display all the data     | Data Grid        | dg_tran         |
| Button1    | To add record            | Command Button   | btn_add         |
| Button2    | To update record         | Command Button   | btn_update      |
| Button3    | To delete record         | Command Button   | btn_delete      |
| Button4    | To save changes          | Command Button   | btn_save        |
| Button5    | To cancel action         | Command Button   | btn_cancel      |

|         |                          |                |                  |
|---------|--------------------------|----------------|------------------|
| Button6 | To show all data in grid | Command Button | btn_show_all     |
| Button7 | To go back to main form  | Command Button | btn_back_to_main |

## 2.3 output screen layouts

frm\_main.vb





## frm\_member.vb

Member Information

Member ID

Member Name

IC No:

Address

Phone

Registration Date

Expiry Date

Maximum Items

Add Update

Show All Delete

Save Cancel

Back To Main Form

frm\_book.vb

The screenshot shows a Visual Basic form titled "Book Information". The form has a blue and green background with a starry pattern. On the left, there is a group box labeled "Book Information" containing several text boxes and dropdown menus for data entry. On the right, there are six buttons: "Add", "Update", "Show All", "Delete", "Save", and "Cancel". At the bottom right, there is a "Back To Main Form" button. A large grey rectangular area is present at the bottom of the form, likely for displaying a list of books.

| Book Information |   |
|------------------|---|
| Book ID          | <input type="text"/>                    |
| Book Title       | <input type="text"/>                    |
| Author's Name    | <input type="text"/>                    |
| Description      | <input type="text"/>                    |
| Category ID      | <input type="text" value="1"/>          |
| Publisher ID     | <input type="text" value="16"/>         |
| ISBN             | <input type="text"/>                    |
| Purchasing Price | <input type="text"/>                    |
| Purchasing Date  | <input type="text" value="22/03/2014"/> |

Buttons: Add, Update, Show All, Delete, Save, Cancel

Back To Main Form

## frm\_category.vb

The screenshot shows a Windows form titled "Category Information". The form has a blue and green abstract background. On the left, there is a group box labeled "Category Information" containing two text boxes: "Category ID" and "Category Name". To the right of the group box, there are six buttons arranged in three rows: "Add", "Update", "Show All", "Delete", "Save", and "Cancel". Below these buttons is a large, empty gray rectangular area, likely a placeholder for a list or data grid. At the bottom right of the form, there is a button labeled "Back To Main Form".

## frm\_publisher.vb

The screenshot shows a Windows form titled "Publisher Information". The form has a blue and green abstract background. On the left, there is a group box labeled "Publisher Information" containing two text boxes: "Publisher ID" and "Publisher Name". To the right of the group box, there are six buttons arranged in three rows: "Add", "Update", "Show All", "Delete", "Save", and "Cancel". Below these buttons is a large, empty gray rectangular area, likely a placeholder for a list or data grid. At the bottom right of the form, there is a button labeled "Back To Main Form".

## frm\_transaction.vb

Rental Information

Rental Information

Transaction ID

Member ID

Book ID

Borrow Date

Due Date

Status

Add

Update

Show All

Delete

Save

Cancel

Back To Main Form

### 3. PROGRAM LISTING

---

#### frm\_main.vb

```
Public Class frm_main

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

        'start the form as maximized state
        Me.WindowState = FormWindowState.Maximized

        'add background image for form
        Me.BackgroundImage = Image.FromFile("D:\My Projects\Library Management\Wallpaper.jpg")

    End Sub

    Private Sub mnu_exit_Click(sender As Object, e As EventArgs) Handles mnu_exit.Click

        'exit from the whole application
        Application.Exit()

    End Sub

    Private Sub mnu_publisher_Click(sender As Object, e As EventArgs) Handles mnu_publisher.Click

        'hide current from and show publisher form
        Me.Hide()
        frm_publisher.Show()

    End Sub

    Private Sub mnu_category_Click(sender As Object, e As EventArgs) Handles mnu_category.Click

        'hide current from and show category form
        Me.Hide()
        frm_category.Show()

    End Sub

    Private Sub mnu_member_Click(sender As Object, e As EventArgs) Handles mnu_member.Click

        'hide current from and show member form
        Me.Hide()
        frm_member.Show()

    End Sub

    Private Sub mnu_book_Click(sender As Object, e As EventArgs) Handles mnu_book.Click
```

```

        'hide current from and show book form
        Me.Hide()
        frm_book.Show()

    End Sub

    Private Sub mnu_rental_Click(sender As Object, e As EventArgs) Handles
        mnu_rental.Click

        'hide current form and show transaction form
        Me.Hide()
        frm_transaction.Show()

    End Sub
End Class

```

### **frm\_member.vb**

```

Imports System
Imports System.Data
Imports System.Data.OleDb

Public Class frm_member

    'define path to database
    Public dsn_name As String = "Provider=Microsoft.ACE.OLEDB.12.0;Data
        Source= D:\\My Projects\\" & _
        "Library Management\\library.accdb"

    'initialize variable
    Dim add_edit As String = ""
    Dim msg_title As String = "Library Management System"

    Private Sub btn_switch(ByVal func As Boolean)

        'boolean sub routine for buttons enable and disable

        btn_add.Enabled = func
        btn_show_all.Enabled = func
        btn_back_to_main.Enabled = func

    End Sub

    Private Sub btn_save_cancel(ByVal func As Boolean)

        'boolean sub routine for buttons enable and disable
        btn_save.Enabled = func
        btn_cancel.Enabled = func

    End Sub

    Private Sub btn_delete_update(ByVal func As Boolean)

        'boolean sub routine for buttons enable and disable
        btn_delete.Enabled = func
        btn_update.Enabled = func
    End Sub

```

```
End Sub
```

```
Private Sub clear_textbox()
```

```
    'clear text boxes and reset
    txt_mem_name.Text = ""
    txt_ic.Text = ""
    txt_addr.Text = ""
    txt_phone.Text = ""
    dt_reg_date.ResetText()
    dt_exp_date.ResetText()
    txt_max_items.Text = ""
```

```
End Sub
```

```
Private Sub txt_read_only(ByVal func As Boolean)
```

```
    'make other text box(es) read only
    txt_mem_name.ReadOnly = func
    txt_ic.ReadOnly = func
    txt_addr.ReadOnly = func
    txt_phone.ReadOnly = func
    dt_reg_date.Enabled = Not (func)
    dt_exp_date.Enabled = Not (func)
    txt_max_items.ReadOnly = func
```

```
End Sub
```

```
Private Sub assign_data_show_values()
```

```
    'assign data grid's values to variables
    Dim mem_id As String =
    dg_member.SelectedRows(0).Cells(0).Value.ToString()
    Dim mem_name As String =
    dg_member.SelectedRows(0).Cells(1).Value.ToString()
    Dim ic As String =
    dg_member.SelectedRows(0).Cells(2).Value.ToString()
    Dim addr As String =
    dg_member.SelectedRows(0).Cells(3).Value.ToString()
    Dim phone As String =
    dg_member.SelectedRows(0).Cells(4).Value.ToString()
    Dim reg_date As String =
    dg_member.SelectedRows(0).Cells(5).Value.ToString()
    Dim exp_date As String =
    dg_member.SelectedRows(0).Cells(6).Value.ToString()
    Dim max_items As String =
    dg_member.SelectedRows(0).Cells(7).Value.ToString()

    'show values in text boxes
    txt_mem_id.Text = mem_id
    txt_mem_name.Text = mem_name
    txt_ic.Text = ic
    txt_addr.Text = addr
    txt_phone.Text = phone
    dt_reg_date.Value = reg_date
    dt_exp_date.Value = exp_date
    txt_max_items.Text = max_items
```

```

End Sub

Private Sub btn_back_to_main_Click(sender As Object, e As EventArgs)
Handles btn_back_to_main.Click

    'hide current form and show main form
    Me.Hide()
    frm_main.Show()

End Sub

Private Sub btn_show_all_Click(sender As Object, e As EventArgs)
Handles btn_show_all.Click

    'create the database connection
    Dim cn As New OleDbConnection(dsn_name)

    'create the select SQL
    Dim da As New OleDbDataAdapter("SELECT mem_id AS [Member
ID],mem_name AS [Member Name],ic AS [IC No]," & _
                                "addr AS [Address],phone AS
[Phone],reg_date AS [Registration Date]," & _
                                "exp_date AS [Expiry Date],max_items
AS [Maximum Items] FROM member " & _
                                "ORDER BY mem_id", cn)

    Dim dt As New DataTable

    da.Fill(dt)
    da.Dispose()
    cn.Dispose()
    dg_member.DataSource = dt

    'enable and disable of buttons
    btn_save_cancel(False)
    btn_switch(True)
    btn_delete_update(True)

    'make other text box(es) read only
    txt_read_only(True)

End Sub

Private Sub frm_member_FormClosed(sender As Object, e As
FormClosedEventArgs) Handles Me.FormClosed

    'show the main form if the user close current form
    frm_main.Show()

End Sub

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

    'hide the maximize and minimize buttons
    Me.FormBorderStyle = Windows.Forms.FormBorderStyle.FixedToolWindow

    'add background image for form
    Me.BackgroundImage = Image.FromFile("D:\My Projects\Library
Management\Wallpaper.jpg")

```



```

        'make the ID text box read only
        Me.txt_mem_id.ReadOnly = True

        'make the data grid read only
        Me.dg_member.ReadOnly = True

        'maximum number of loan items should be 2 digit number only
        txt_max_items.MaxLength = 2

        'enable and disable of buttons
        btn_save_cancel(False)
        btn_switch(True)
        btn_delete_update(False)

        'make other text box(es) read only
        txt_read_only(True)

    End Sub

    Private Sub btn_add_Click(sender As Object, e As EventArgs) Handles
        btn_add.Click

        'show "Auto Number" to user as this text box is a read only text
box
        txt_mem_id.Text = "Auto Number"

        'clear text box(es) and reset date
        clear_textbox()

        'make other text box(es) can type
        txt_read_only(False)

        'set focus to text box
        txt_mem_name.Focus()

        'assign value to add_edit
        add_edit = "add"

        'enable and disable of buttons
        btn_switch(False)
        btn_save_cancel(True)
        btn_delete_update(False)

    End Sub

    Private Sub btn_save_Click(sender As Object, e As EventArgs) Handles
        btn_save.Click

        'check validation to text boxes
        If validate_fields() = True Then

            'if the variable contains 'add'
            If add_edit = "add" Then

                'get data from text box(es)
                Dim mem_name As String = Trim(txt_mem_name.Text)
                Dim ic As String = Trim(txt_ic.Text)

```

```

        Dim addr As String = Trim(txt_addr.Text)
        Dim phone As String = Trim(txt_phone.Text)
        Dim reg_date As String =
dt_reg_date.Value.ToString("dd/MM/yyyy")
        Dim exp_date As String =
dt_exp_date.Value.ToString("dd/MM/yyyy")
        Dim max_items As String = Trim(txt_max_items.Text)

        'insert a record to the table
        Dim str_add As String = "INSERT INTO member
(mem_name,ic,addr,phone,reg_date,exp_date,max_items) " & _
"VALUES ('" & mem_name & "','" & ic
& "','" & addr & "','" & phone & "','" & _
reg_date & "','" & exp_date & "','"
& max_items & "')"

        'create database connection
        Dim cn As New OleDbConnection(dsn_name)
        Dim cmd As New OleDbCommand

        With cmd

            .CommandText = str_add
            .Connection = cn
            .Connection.Open()
            .ExecuteNonQuery()
            .Connection.Close()
            .Dispose()

        End With
        cn.Dispose()

        'show status
        MessageBox.Show("The record is added !", msg_title,
MessageBoxButtons.OK, MessageBoxIcon.Information)

        'refresh data grid
        btn_show_all_Click(btn_show_all, New EventArgs())

        'if the variable contains 'edit'
Else

        'get data from text boxes
        Dim mem_id As String = txt_mem_id.Text
        Dim mem_name As String = Trim(txt_mem_name.Text)
        Dim ic As String = Trim(txt_ic.Text)
        Dim addr As String = Trim(txt_addr.Text)
        Dim phone As String = Trim(txt_phone.Text)
        Dim reg_date As String =
dt_reg_date.Value.ToString("dd/MM/yyyy")
        Dim exp_date As String =
dt_exp_date.Value.ToString("dd/MM/yyyy")
        Dim max_items As String = Trim(txt_max_items.Text)

        'update record according to specific ID
        Dim str_update As String = "UPDATE member SET mem_name = '"
& mem_name & "','" & ic = "'" & ic & _
"'', addr = '" & addr & "','" & phone
= "'" & phone & "','" & reg_date = #" & _

```

```

                                reg_date & "#, exp_date= #" &
exp_date & "#, max_items= " & max_items & _
                                " WHERE mem_id = " & mem_id

    'create database connection
    Dim cn As New OleDbConnection(dsn_name)
    Dim cmd As New OleDbCommand

    With cmd

        .CommandText = str_update
        .Connection = cn
        .Connection.Open()
        .ExecuteNonQuery()
        .Connection.Close()
        .Dispose()

    End With
    cn.Dispose()

    'show status
    MessageBox.Show("The record is updated !", msg_title,
    MessageBoxButtons.OK, MessageBoxIcon.Information)

    'refresh data grid
    btn_show_all_Click(btn_show_all, New EventArgs())

End If

Else

    'if the data is not validated then exit this sub routine
    Exit Sub

End If

'enable and disable of buttons
btn_save_cancel(False)
btn_switch(True)
btn_delete_update(False)

'make other text box(es) read only
txt_read_only(True)

'set variable to null
add_edit = ""

End Sub

Private Function validate_fields() As Boolean

    'check validation of data entries
    If Trim(txt_mem_name.Text) = "" Then

        'if the data fields are empty
        MessageBox.Show("Name cannot be empty !", msg_title,
        MessageBoxButtons.OK, MessageBoxIcon.Error)

        'make other text box(es) can type

```

```
        txt_read_only(False)

        txt_mem_name.Focus()

        Return False

    End If

    If Trim(txt_ic.Text) = "" Then

        MessageBox.Show("IC number cannot be empty !", msg_title,
        MessageBoxButtons.OK, MessageBoxIcon.Error)

        'make other text box(es) can type
        txt_read_only(False)

        txt_ic.Focus()

        Return False

    End If

    If Trim(txt_addr.Text) = "" Then

        MessageBox.Show("Address cannot be empty !", msg_title,
        MessageBoxButtons.OK, MessageBoxIcon.Error)

        'make other text box(es) can type
        txt_read_only(False)

        txt_addr.Focus()

        Return False

    End If

    If Trim(txt_phone.Text) = "" Then

        MessageBox.Show("Phone cannot be empty !", msg_title,
        MessageBoxButtons.OK, MessageBoxIcon.Error)

        'make other text box(es) can type
        txt_read_only(False)

        txt_mem_name.Focus()

        Return False

    End If

    If Trim(txt_max_items.Text) = "" Then

        MessageBox.Show("Maximum items cannot be empty", msg_title,
        MessageBoxButtons.OK, MessageBoxIcon.Error)

        'make other text box(es) can type
        txt_read_only(False)

        txt_max_items.Focus()
```

```
        Return False

    End If

    Try

        Dim valid_max_items As Integer = CInt(txt_max_items.Text)

    Catch ex As Exception

        'if it's not a valid number format
        MessageBox.Show("Please enter a valid number !", msg_title,
        MessageBoxButtons.OK, MessageBoxIcon.Error)

        'make other text box(es) can type
        txt_read_only(False)

        txt_max_items.Focus()

        Return False

    End Try

    Return True

End Function

Private Sub btn_update_Click(sender As Object, e As EventArgs) Handles
    btn_update.Click

    Try

        Dim selected_row_count As Integer =
        dg_member.Rows.GetRowCount(DataGridViewElementStates.Selected)

        If selected_row_count > 0 Then

            'assign data grid's values to variables and show values in
            text boxes
            assign_data_show_values()

        End If

        'user choose a blank row in data grid view to perform operation
    Catch ex As Exception

        MessageBox.Show("Error !!!" & vbNewLine & _
        "Choose a valid record !", msg_title,
        MessageBoxButtons.OK, MessageBoxIcon.Error)

        'make other text box(es) read only
        txt_read_only(True)

        'enable and disable of buttons
        btn_save_cancel(False)
        btn_switch(True)
        btn_delete_update(True)
```

```

        'exit this sub routine
        Exit Sub

    End Try

    'make other text box(es) can type
    txt_read_only(False)

    txt_mem_name.Focus()

    'assign 'edit' in variable
    add_edit = "edit"

    'enable and disable of buttons
    btn_save_cancel(True)
    btn_switch(False)
    btn_delete_update(False)

End Sub

Private Sub btn_cancel_Click(sender As Object, e As EventArgs) Handles
    btn_cancel.Click

    'clear text boxes
    txt_mem_id.Text = ""
    clear_textbox()

    'buttons enable and disable
    btn_save_cancel(False)
    btn_switch(True)
    btn_delete_update(False)

    'make other text box(es) read only
    txt_read_only(True)

End Sub

Private Sub btn_delete_Click(sender As Object, e As EventArgs) Handles
    btn_delete.Click

    Dim selected_row_count As Integer =
    dg_member.Rows.GetRowCount(DataGridViewElementStates.Selected)

    'if there is no row in table
    If selected_row_count = 0 Then

        'show status
        MessageBox.Show("No records to delete !", msg_title,
        MessageBoxButtons.OK, MessageBoxIcon.Exclamation)

        'enable and disable of buttons
        btn_save_cancel(False)
        btn_switch(True)
        btn_delete_update(False)

        'make other text box(es) read only
        txt_read_only(True)

        'exit this sub routine

```

```

Exit Sub

End If

Try

    'if there is at least one record
    If selected_row_count > 0 Then

        'assign data and show values in text boxes
        assign_data_show_values()

    End If

    'user choose a blank row in data grid view to perform operation
Catch ex As Exception

    MessageBox.Show("Error !!!" & vbNewLine & _
        "Choose a valid record !", msg_title,
    MessageBoxButtons.OK, MessageBoxIcon.Error)

    'make other text box(es) read only
    txt_read_only(True)

    'enable and disable of buttons
    btn_save_cancel(False)
    btn_switch(True)
    btn_delete_update(True)

    'exit this sub routine
    Exit Sub

End Try

'ask confirmation to delete
If (MessageBox.Show("Are you sure you want to delete " & _
    "this record ?", msg_title,
    MessageBoxButtons.YesNo, MessageBoxIcon.Question) = vbYes) Then

    Dim mem_id As String = txt_mem_id.Text

    'create database connection
    Dim cn As New OleDbConnection(dsn_name)
    Dim cmd As New OleDbCommand

    With cmd

        'delete the specific record according to ID
        .CommandText = "DELETE FROM member WHERE mem_id = " &
mem_id

        .Connection = cn
        .Connection.Open()
        .ExecuteNonQuery()
        .Connection.Close()
        .Dispose()

    End With
    cn.Dispose()

```

```

        'show status
        MessageBox.Show("The record is deleted !", msg_title,
        MessageBoxButtons.OK, MessageBoxIcon.Exclamation)

        'clear text box(es)
        txt_mem_id.Text = ""
        clear_textbox()

        'refresh data grid
        btn_show_all_Click(btn_show_all, New EventArgs())

    Else

        MessageBox.Show("The record is not deleted !", msg_title,
        MessageBoxButtons.OK, MessageBoxIcon.Information)

    End If

    'enable and disable of buttons
    btn_save_cancel(False)
    btn_switch(True)
    btn_delete_update(False)

    'make other text box(es) read only
    txt_read_only(True)

End Sub

End Class

```

### **frm book.vb**

```

Imports System
Imports System.Data
Imports System.Data.OleDb

Public Class frm_book

    'define path to database
    Public dsn_name As String = "Provider=Microsoft.ACE.OLEDB.12.0;Data
    Source= D:\\My Projects\\" & _
        "Library Management\\library.accdb"

    'initialize variable
    Dim add_edit As String = ""
    Dim msg_title As String = "Library Management System"

    Private Sub btn_switch(ByVal func As Boolean)

        'boolean sub routine for buttons enable and disable

        btn_add.Enabled = func
        btn_show_all.Enabled = func
        btn_back_to_main.Enabled = func
    End Sub

```



```
End Sub

Private Sub btn_save_cancel(ByVal func As Boolean)

    'boolean sub routine for buttons enable and disable
    btn_save.Enabled = func
    btn_cancel.Enabled = func

End Sub

Private Sub btn_delete_update(ByVal func As Boolean)

    'boolean sub routine for buttons enable and disable
    btn_delete.Enabled = func
    btn_update.Enabled = func

End Sub

Private Sub clear_textbox()

    'clear text boxes and reset
    txt_title.Text = ""
    txt_author.Text = ""
    txt_desp.Text = ""
    txt_isbn.Text = ""
    txt_price.Text = ""
    dt_pdate.ResetText()

End Sub

Private Sub txt_read_only(ByVal func As Boolean)

    'make other text box(es) read only
    txt_title.ReadOnly = func
    txt_author.ReadOnly = func
    txt_desp.ReadOnly = func
    cbo_cat_id.Enabled = Not (func)
    cbo_pub_id.Enabled = Not (func)
    txt_isbn.ReadOnly = func
    txt_price.ReadOnly = func
    dt_pdate.Enabled = Not (func)

End Sub

Private Sub assign_data_show_values()

    'assign data grid's values to variables
    Dim b_id As String =
dg_book.SelectedRows(0).Cells(0).Value.ToString()
    Dim title As String =
dg_book.SelectedRows(0).Cells(1).Value.ToString()
    Dim author As String =
dg_book.SelectedRows(0).Cells(2).Value.ToString()
    Dim desp As String =
dg_book.SelectedRows(0).Cells(3).Value.ToString()
    Dim cat_id As String =
dg_book.SelectedRows(0).Cells(4).Value.ToString()
```

```

        Dim pub_id As String =
dg_book.SelectedRows(0).Cells(5).Value.ToString()
        Dim isbn As String =
dg_book.SelectedRows(0).Cells(6).Value.ToString()
        Dim price As String =
dg_book.SelectedRows(0).Cells(7).Value.ToString()
        Dim pdate As String =
dg_book.SelectedRows(0).Cells(8).Value.ToString()

        'show values in text boxes
        txt_b_id.Text = b_id
        txt_title.Text = title
        txt_author.Text = author
        txt_desp.Text = desp
        cbo_cat_id.Text = cat_id
        cbo_pub_id.Text = pub_id
        txt_isbn.Text = isbn
        txt_price.Text = price
        dt_pdate.Value = pdate

    End Sub

    Private Function validate_fields() As Boolean

        'check validation of data entries
        If Trim(txt_title.Text) = "" Then

            'if the data fields are empty
            MessageBox.Show("Book title cannot be empty !", msg_title,
MessageBoxButtons.OK, MessageBoxIcon.Error)

            'make other text box(es) can type
            txt_read_only(False)

            txt_title.Focus()

            Return False

        End If

        If Trim(txt_author.Text) = "" Then

            MessageBox.Show("Author cannot be empty !", msg_title,
MessageBoxButtons.OK, MessageBoxIcon.Error)

            'make other text box(es) can type
            txt_read_only(False)

            txt_author.Focus()

            Return False

        End If

        If Trim(txt_desp.Text) = "" Then

            MessageBox.Show("Description cannot be empty !", msg_title,
MessageBoxButtons.OK, MessageBoxIcon.Error)

```

```
'make other text box(es) can type
txt_read_only(False)

txt_desp.Focus()

Return False

End If

If Trim(txt_isbn.Text) = "" Then

    MessageBox.Show("ISBN cannot be empty !", msg_title,
    MessageBoxButtons.OK, MessageBoxIcon.Error)

    'make other text box(es) can type
    txt_read_only(False)

    txt_isbn.Focus()

    Return False

End If

If Trim(txt_price.Text) = "" Then

    MessageBox.Show("Price cannot be empty", msg_title,
    MessageBoxButtons.OK, MessageBoxIcon.Error)

    'make other text box(es) can type
    txt_read_only(False)

    txt_price.Focus()

    Return False

End If

Try

    Dim valid_price As Decimal = CDec(txt_price.Text)

Catch ex As Exception

    'if it's not a valid number format
    MessageBox.Show("Please enter a valid price !", msg_title,
    MessageBoxButtons.OK, MessageBoxIcon.Error)

    'make other text box(es) can type
    txt_read_only(False)

    txt_price.Focus()

    Return False

End Try

Return True

End Function
```

```

Private Sub btn_back_to_main_Click(sender As Object, e As EventArgs)
Handles btn_back_to_main.Click

    'hide current form and show main form
    Me.Hide()
    frm_main.Show()

End Sub

Private Sub btn_show_all_Click(sender As Object, e As EventArgs)
Handles btn_show_all.Click

    'create the database connection
    Dim cn As New OleDbConnection(dsn_name)

    'create the select SQL
    Dim da As New OleDbDataAdapter("SELECT b_id AS [Book ID],title AS
Title,author AS Author," & _
                                "desp AS Description,cat_id AS
[Category ID],pub_id AS [Publisher ID]," & _
                                "isbn AS [ISBN No],price AS
[Purchasing Price],pdate AS [Purchasing Date]" & _
                                " FROM book ORDER BY b_id", cn)

    Dim dt As New DataTable

    da.Fill(dt)
    da.Dispose()
    cn.Dispose()
    dg_book.DataSource = dt

    'enable and disable of buttons
    btn_save_cancel(False)
    btn_switch(True)
    btn_delete_update(True)

    'make other text box(es) read only
    txt_read_only(True)

End Sub

Private Sub frm_member_FormClosed(sender As Object, e As
FormClosedEventArgs) Handles Me.FormClosed

    'show the main form if the user close current form
    frm_main.Show()

End Sub

Private Sub frm_book_Load(sender As Object, e As EventArgs) Handles
Me.Load

    'hide the maximize and minimize buttons
    Me.FormBorderStyle = Windows.Forms.FormBorderStyle.FixedToolWindow

    'add background image for form
    Me.BackgroundImage = Image.FromFile("D:\My Projects\Library
Management\Wallpaper.jpg")

```

```

        'make the ID text box read only
        Me.txt_b_id.ReadOnly = True

        'make the data grid read only
        Me.dg_book.ReadOnly = True

        'to take category ID from category table
        'create the database connection
        Dim cn As New OleDbConnection(dsn_name)

        'create the select SQL
        Dim da_cat As New OleDbDataAdapter("SELECT cat_id FROM category
ORDER BY cat_id", cn)
        Dim dt_cat As New DataTable

        da_cat.Fill(dt_cat)
        da_cat.Dispose()
        cn.Dispose()
        cbo_cat_id.DataSource = dt_cat
        cbo_cat_id.DisplayMember = "cat_id"

        'to take publisher ID from publisher table
        'create the database connection
        Dim con As New OleDbConnection(dsn_name)

        'create the select SQL
        Dim dat As New OleDbDataAdapter("SELECT pub_id FROM publisher ORDER
BY pub_id", con)
        Dim tab As New DataTable

        dat.Fill(tab)
        dat.Dispose()
        con.Dispose()
        cbo_pub_id.DataSource = tab
        cbo_pub_id.DisplayMember = "pub_id"

        'enable and disable of buttons
        btn_save_cancel(False)
        btn_switch(True)
        btn_delete_update(False)

        'make other text box(es) read only
        txt_read_only(True)

    End Sub

    Private Sub btn_add_Click(sender As Object, e As EventArgs) Handles
        btn_add.Click

        'show "Auto Number" to user as this text box is a read only text
box
        txt_b_id.Text = "Auto Number"

        'clear text box(es) and reset date
        clear_textbox()

        'make other text box(es) can type
        txt_read_only(False)

```

```

        'set focus to text box
        txt_title.Focus()

        'assign value to add_edit
        add_edit = "add"

        'enable and disable of buttons
        btn_switch(False)
        btn_save_cancel(True)
        btn_delete_update(False)

    End Sub

    Private Sub btn_update_Click(sender As Object, e As EventArgs) Handles
        btn_update.Click

        Try

            Dim selected_row_count As Integer =
                dg_book.Rows.GetRowCount(DataGridViewElementStates.Selected)

            If selected_row_count > 0 Then

                'assign data grid's values to variables and show values in
                text boxes
                assign_data_show_values()

            End If

            'user choose a blank row in data grid view to perform operation
            Catch ex As Exception

                MessageBox.Show("Error !!!" & vbNewLine & _
                    "Choose a valid record !", msg_title,
                MessageBoxButtons.OK, MessageBoxIcon.Error)

                'make other text box(es) read only
                txt_read_only(True)

                'enable and disable of buttons
                btn_save_cancel(False)
                btn_switch(True)
                btn_delete_update(True)

                'exit this sub routine
                Exit Sub

            End Try

            'make other text box(es) can type
            txt_read_only(False)

            txt_title.Focus()

            'assign 'edit' in variable
            add_edit = "edit"

            'enable and disable of buttons

```

```

        btn_save_cancel(True)
        btn_switch(False)
        btn_delete_update(False)

    End Sub

    Private Sub btn_save_Click(sender As Object, e As EventArgs) Handles
        btn_save.Click

        'check validation to text boxes
        If validate_fields() = True Then

            'if the variable contains 'add'
            If add_edit = "add" Then

                'get data from text box(es)
                Dim title As String = Trim(txt_title.Text)
                Dim author As String = Trim(txt_author.Text)
                Dim desp As String = Trim(txt_desp.Text)
                Dim cat_id As String = cbo_cat_id.Text
                Dim pub_id As String = cbo_pub_id.Text
                Dim isbn As String = txt_isbn.Text
                Dim price As String = Trim(txt_price.Text)
                Dim pdate As String = dt_pdate.Value.ToString("dd/MM/yyyy")

                'insert a record to the table
                Dim str_add As String = "INSERT INTO book
(title,author,desp,cat_id,pub_id,isbn,price,pdate) " & _
                "VALUES ('" & title & "','" &
                author & "','" & desp & "','" & cat_id & "','" & _
                pub_id & "','" & isbn & "','" & price
                & "," & pdate & "#)"

                'create database connection
                Dim cn As New OleDbConnection(dsn_name)
                Dim cmd As New OleDbCommand

                With cmd

                    .CommandText = str_add
                    .Connection = cn
                    .Connection.Open()
                    .ExecuteNonQuery()
                    .Connection.Close()
                    .Dispose()

                End With
                cn.Dispose()

                'show status
                MessageBox.Show("The record is added !", msg_title,
                MessageBoxButtons.OK, MessageBoxIcon.Information)

                'refresh data grid
                btn_show_all_Click(btn_show_all, New EventArgs())

                'if the variable contains 'edit'
            Else

```

```

'get data from text boxes
Dim b_id As String = txt_b_id.Text
Dim title As String = Trim(txt_title.Text)
Dim author As String = Trim(txt_author.Text)
Dim desp As String = Trim(txt_desp.Text)
Dim cat_id As String = cbo_cat_id.Text
Dim pub_id As String = cbo_pub_id.Text
Dim isbn As String = txt_isbn.Text
Dim price As String = Trim(txt_price.Text)
Dim pdate As String = dt_pdate.Value.ToString("dd/MM/yyyy")

'update record according to specific ID
Dim str_update As String = "UPDATE book SET title = '" &
title & "', author = '" & author & _
                                "', desp = '" & desp & "',
cat_id = '" & cat_id & "', pub_id = '" & _
                                pub_id & "', isbn = '" & isbn &
"', price = '" & price & "', pdate =#" & pdate & _
                                "# WHERE b_id = '" & b_id

'create database connection
Dim cn As New OleDbConnection(dsn_name)
Dim cmd As New OleDbCommand

With cmd
    .CommandText = str_update
    .Connection = cn
    .Connection.Open()
    .ExecuteNonQuery()
    .Connection.Close()
    .Dispose()

End With
cn.Dispose()

'show status
MessageBox.Show("The record is updated !", msg_title,
MessageBoxButtons.OK, MessageBoxIcon.Information)

'refresh data grid
btn_show_all_Click(btn_show_all, New EventArgs())

End If

Else

'if the data is not validated then exit this sub routine
Exit Sub

End If

'enable and disable of buttons
btn_save_cancel(False)
btn_switch(True)
btn_delete_update(False)

'make other text box(es) read only
txt_read_only(True)

```



```
'set variable to null
add_edit = ""

End Sub

Private Sub btn_delete_Click(sender As Object, e As EventArgs) Handles
    btn_delete.Click

    Dim selected_row_count As Integer =
dg_book.Rows.GetRowCount(DataGridViewElementStates.Selected)

    'if there is no row in table
    If selected_row_count = 0 Then

        'show status
        MessageBox.Show("No records to delete !", msg_title,
        MessageBoxButtons.OK, MessageBoxIcon.Exclamation)

        'enable and disable of buttons
        btn_save_cancel(False)
        btn_switch(True)
        btn_delete_update(False)

        'make other text box(es) read only
        txt_read_only(True)

        'exit this sub routine
        Exit Sub

    End If

    Try

        'if there is at least one record
        If selected_row_count > 0 Then

            'assign data and show values in text boxes
            assign_data_show_values()

        End If

        'user choose a blank row in data grid view to perform operation
        Catch ex As Exception

            MessageBox.Show("Error !!!" & vbNewLine & _
                "Choose a valid record !", msg_title,
            MessageBoxButtons.OK, MessageBoxIcon.Error)

            'make other text box(es) read only
            txt_read_only(True)

            'enable and disable of buttons
            btn_save_cancel(False)
            btn_switch(True)
            btn_delete_update(True)

            'exit this sub routine
            Exit Sub

        End Catch

    End Try

End Sub
```

```

End Try

'ask confirmation to delete
If (MessageBox.Show("Are you sure you want to delete " & _
    "this record ?", msg_title,
    MessageBoxButtons.YesNo, MessageBoxIcon.Question) = vbYes) Then

    Dim b_id As String = txt_b_id.Text

    'create database connection
    Dim cn As New OleDbConnection(dsn_name)
    Dim cmd As New OleDbCommand

    With cmd

        'delete the specific record according to ID
        .CommandText = "DELETE FROM book WHERE b_id = " & b_id
        .Connection = cn
        .Connection.Open()
        .ExecuteNonQuery()
        .Connection.Close()
        .Dispose()

    End With
    cn.Dispose()

    'show status
    MessageBox.Show("The record is deleted !", msg_title,
    MessageBoxButtons.OK, MessageBoxIcon.Exclamation)

    'clear text box(es)
    txt_b_id.Text = ""
    clear_textbox()

    'refresh data grid
    btn_show_all_Click(btn_show_all, New EventArgs())

Else

    MessageBox.Show("The record is not deleted !", msg_title,
    MessageBoxButtons.OK, MessageBoxIcon.Information)

End If

'enable and disable of buttons
btn_save_cancel(False)
btn_switch(True)
btn_delete_update(False)

'make other text box(es) read only
txt_read_only(True)

End Sub

Private Sub btn_cancel_Click(sender As Object, e As EventArgs) Handles
    btn_cancel.Click

    'clear text boxes

```

```

txt_b_id.Text = ""
clear_textbox()

'buttons enable and disable
btn_save_cancel(False)
btn_switch(True)
btn_delete_update(False)

'make other text box(es) read only
txt_read_only(True)

```

```
End Sub
```

```
End Class
```

### **frm\_category**

```
Imports System
Imports System.Data
Imports System.Data.OleDb

```

```
Public Class frm_category
```

```
    'define path to database
```

```
    Public dsn_name As String = "Provider=Microsoft.ACE.OLEDB.12.0;Data
Source= D:\\My Projects\\" & _
                                "Library Management\\library.accdb"

```

```
    'initialize variable
```

```
    Dim add_edit As String = ""
```

```
    Dim msg_title As String = "Library Management System"

```

```
    Private Sub btn_back_to_main_Click(sender As Object, e As EventArgs)
Handles btn_back_to_main.Click

```

```
        'hide current form and show main form
```

```
        Me.Hide()
```

```
        frm_main.Show()

```

```
End Sub
```

```
    Private Sub frm_category_FormClosed(sender As Object, e As
FormClosedEventArgs) Handles Me.FormClosed

```

```
        'show the main form if the user close current form
```

```
        frm_main.Show()

```

```
End Sub
```

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

```

```
        'hide the maximize and minimize buttons
```

```
        Me.FormBorderStyle = Windows.Forms.FormBorderStyle.FixedToolWindow

```

```
        'add background image for form

```

```

Me.BackgroundImage = Image.FromFile("D:\My Projects\Library
Management\Wallpaper.jpg")

'make the ID text box read only
Me.txt_cat_id.ReadOnly = True

'make the data grid read only
Me.dg_category.ReadOnly = True

'enable and disable of buttons
btn_save_cancel(False)
btn_switch(True)
btn_delete_update(False)

'make other text box(es) read only
txt_read_only(True)

End Sub

Private Sub btn_show_all_Click(sender As Object, e As EventArgs)
Handles btn_show_all.Click

'create the database connection
Dim cn As New OleDbConnection(dsn_name)

'create the select SQL
Dim da As New OleDbDataAdapter("SELECT cat_id AS [Category
ID],cat_name AS [Category Name] FROM category " & _
"ORDER BY cat_id", cn)

Dim dt As New DataTable

da.Fill(dt)
da.Dispose()
cn.Dispose()
dg_category.DataSource = dt

'make other text box(es) read only
txt_read_only(True)

'enable and disable of buttons
btn_save_cancel(False)
btn_switch(True)
btn_delete_update(True)

End Sub

Private Sub btn_add_Click(sender As Object, e As EventArgs) Handles
btn_add.Click

'show "Auto Number" to user as this text box is a read only text
box
txt_cat_id.Text = "Auto Number"

'clear text box
txt_cat_name.Text = ""

'make other text box(es) can type
txt_read_only(False)

```

```

        'set focus to text box
        txt_cat_name.Focus()

        'assign value to add_edit
        add_edit = "add"

        'enable and disable of buttons
        btn_switch(False)
        btn_save_cancel(True)
        btn_delete_update(False)

    End Sub

    Private Sub btn_save_Click(sender As Object, e As EventArgs) Handles
        btn_save.Click

        'check validation to text boxes
        If validate_fields() = True Then

            'if the variable contains 'add'
            If add_edit = "add" Then

                'get data from text box(es)
                Dim cat_name As String = Trim(txt_cat_name.Text)

                'insert a record to the table
                Dim str_add As String = "INSERT INTO category (cat_name)
VALUES ('" & cat_name & "')"

                'create database connection
                Dim cn As New OleDbConnection(dsn_name)
                Dim cmd As New OleDbCommand

                With cmd

                    .CommandText = str_add
                    .Connection = cn
                    .Connection.Open()
                    .ExecuteNonQuery()
                    .Connection.Close()
                    .Dispose()

                End With
                cn.Dispose()

                'show status
                MessageBox.Show("The record is added !", msg_title,
                MessageBoxButtons.OK, MessageBoxIcon.Information)

                'refresh data grid
                btn_show_all_Click(btn_show_all, New EventArgs())

                'if the variable contains 'edit'
            Else

                'get data from text boxes
                Dim cat_id As String = txt_cat_id.Text
                Dim cat_name As String = Trim(txt_cat_name.Text)

```

```

        'update record according to specific ID
        Dim str_update As String = "UPDATE category SET cat_name =
'" & cat_name & "' WHERE cat_id = " & cat_id

        'create database connection
        Dim cn As New OleDbConnection(dsn_name)
        Dim cmd As New OleDbCommand

        With cmd

            .CommandText = str_update
            .Connection = cn
            .Connection.Open()
            .ExecuteNonQuery()
            .Connection.Close()
            .Dispose()

        End With
        cn.Dispose()

        'show status
        MessageBox.Show("The record is updated !", msg_title,
        MessageBoxButtons.OK, MessageBoxIcon.Information)

        'refresh data grid
        btn_show_all_Click(btn_show_all, New EventArgs())

    End If

Else

    'if the data is not validated then exit this sub routine
    Exit Sub

End If

'enable and disable of buttons
btn_save_cancel(False)
btn_switch(True)
btn_delete_update(False)

'make other text box(es) read only
txt_read_only(True)

'set variable to null
add_edit = ""

End Sub

Private Sub btn_delete_Click(sender As Object, e As EventArgs) Handles
btn_delete.Click

    Dim selected_row_count As Integer =
dg_category.Rows.GetRowCount(DataGridViewElementStates.Selected)

    'if there is no row in table
    If selected_row_count = 0 Then

```

```

        'show status
        MessageBox.Show("No records to delete !", msg_title,
        MessageBoxButtons.OK, MessageBoxIcon.Exclamation)

        'enable and disable of buttons
        btn_save_cancel(False)
        btn_switch(True)
        btn_delete_update(False)

        'make other text box(es) read only
        txt_read_only(True)

        'exit this sub routine
        Exit Sub

    End If

    Try

        'if there is at least one record
        If selected_row_count > 0 Then

            'assign data grid's values to variables
            Dim cat_id As String =
            dg_category.SelectedRows(0).Cells(0).Value.ToString()
            Dim cat_name As String =
            dg_category.SelectedRows(0).Cells(1).Value.ToString()

            'show values in text boxes
            txt_cat_id.Text = cat_id
            txt_cat_name.Text = cat_name

        End If

        'user choose a blank row in data grid view to perform operation
        Catch ex As Exception

            MessageBox.Show("Error !!!" & vbNewLine & _
            "Choose a valid record !", msg_title,
            MessageBoxButtons.OK, MessageBoxIcon.Error)

            'make other text box(es) read only
            txt_read_only(True)

            'enable and disable of buttons
            btn_save_cancel(False)
            btn_switch(True)
            btn_delete_update(True)

            'exit this sub routine
            Exit Sub

        End Try

        'ask confirmation to delete
        If (MessageBox.Show("Are you sure you want to delete " & _
            "this record ?", msg_title,
            MessageBoxButtons.YesNo, MessageBoxIcon.Question) = vbYes) Then

```

```

        Dim cat_id As String = txt_cat_id.Text

        'create database connection
        Dim cn As New OleDbConnection(dsn_name)
        Dim cmd As New OleDbCommand

        With cmd

            'delete the specific record according to ID
            .CommandText = "DELETE FROM category WHERE cat_id = " &
cat_id

            .Connection = cn
            .Connection.Open()
            .ExecuteNonQuery()
            .Connection.Close()
            .Dispose()

        End With
        cn.Dispose()

        'show status
        MessageBox.Show("The record is deleted !", msg_title,
        MessageBoxButtons.OK, MessageBoxIcon.Exclamation)

        'clear text box
        txt_cat_id.Text = ""
        txt_cat_name.Text = ""

        'refresh data grid
        btn_show_all_Click(btn_show_all, New EventArgs())

    Else

        MessageBox.Show("The record is not deleted !", msg_title,
        MessageBoxButtons.OK, MessageBoxIcon.Information)

    End If

    'enable and disable of buttons
    btn_save_cancel(False)
    btn_switch(True)
    btn_delete_update(False)

    'make other text box(es) read only
    txt_read_only(True)

End Sub

Private Sub btn_update_Click(sender As Object, e As EventArgs) Handles
btn_update.Click

    Try

        Dim selected_row_count As Integer =
dg_category.Rows.GetRowCount(DataGridViewElementStates.Selected)

        If selected_row_count > 0 Then

            'assign data grid's values to variables

```



```

        Dim cat_id As String =
dg_category.SelectedRows(0).Cells(0).Value.ToString()
        Dim cat_name As String =
dg_category.SelectedRows(0).Cells(1).Value.ToString()

        'show values in text boxes
        txt_cat_id.Text = cat_id
        txt_cat_name.Text = cat_name

    End If

    'user choose a blank row in data grid view to perform operation
Catch ex As Exception

    MessageBox.Show("Error !!!" & vbCrLf & _
        "Choose a valid record !", msg_title,
    MessageBoxButtons.OK, MessageBoxIcon.Error)

    'make other text box(es) read only
    txt_read_only(True)

    'enable and disable of buttons
    btn_save_cancel(False)
    btn_switch(True)
    btn_delete_update(True)

    'exit this sub routine
    Exit Sub

End Try

'make other text box(es) can type
txt_read_only(False)

txt_cat_name.Focus()

'assign 'edit' in variable
add_edit = "edit"

'enable and disable of buttons
btn_save_cancel(True)
btn_switch(False)
btn_delete_update(False)

End Sub

Private Sub btn_switch(ByVal func As Boolean)

    'boolean sub routine for buttons enable and disable

    btn_add.Enabled = func
    btn_show_all.Enabled = func
    btn_back_to_main.Enabled = func

End Sub

Private Sub btn_save_cancel(ByVal func As Boolean)

    'boolean sub routine for buttons enable and disable

```

```
        btn_save.Enabled = func
        btn_cancel.Enabled = func

    End Sub

    Private Sub btn_cancel_Click(sender As Object, e As EventArgs) Handles
        btn_cancel.Click

        'clear text boxes
        txt_cat_id.Text = ""
        txt_cat_name.Text = ""

        'buttons enable and disable
        btn_save_cancel(False)
        btn_switch(True)
        btn_delete_update(False)

        'make other text box(es) read only
        txt_read_only(True)

    End Sub

    Private Sub btn_delete_update(ByVal func As Boolean)

        'boolean sub routine for buttons enable and disable
        btn_delete.Enabled = func
        btn_update.Enabled = func

    End Sub

    Private Function validate_fields() As Boolean

        'check validation of data entry
        If Trim(txt_cat_name.Text) = "" Then

            MessageBox.Show("Name cannot be empty !", msg_title,
                MessageBoxButtons.OK, MessageBoxIcon.Error)

            'make other text box(es) can type
            txt_read_only(False)

            txt_cat_name.Focus()

            Return False

        End If

        Return True

    End Function

    Private Sub txt_read_only(ByVal func As Boolean)

        'make other text box(es) read only
        txt_cat_name.ReadOnly = func

    End Sub

End Class
```

**frm\_publisher.vb**

```
Imports System
Imports System.Data
Imports System.Data.OleDb

Public Class frm_publisher

    'define path to database
    Public dsn_name As String = "Provider=Microsoft.ACE.OLEDB.12.0;Data
Source= D:\\My Projects\\" & _
        "Library Management\\library.accdb"

    'initialize variable
    Dim add_edit As String = ""
    Dim msg_title As String = "Library Management System"
    Private Sub btn_back_to_main_Click(sender As Object, e As EventArgs)
Handles btn_back_to_main.Click

        'hide current form and show main form
        Me.Hide()
        frm_main.Show()

    End Sub

    Private Sub btn_show_all_Click(sender As Object, e As EventArgs)
Handles btn_show_all.Click

        'create the database connection
        Dim cn As New OleDbConnection(dsn_name)

        'create the select SQL
        Dim da As New OleDbDataAdapter("SELECT pub_id AS [Publisher
ID],pub_name AS [Publisher Name] FROM publisher " & _
        "ORDER BY pub_id", cn)

        Dim dt As New DataTable

        da.Fill(dt)
        da.Dispose()
        cn.Dispose()
        dg_publisher.DataSource = dt

        'enable and disable of buttons
        btn_save_cancel(False)
        btn_switch(True)
        btn_delete_update(True)

        'make other text box(es) read only
        txt_read_only(True)

    End Sub

    Private Sub frm_publisher_FormClosed(sender As Object, e As
FormClosedEventArgs) Handles Me.FormClosed
```

```
'show the main form if the user close current form
frm_main.Show()

End Sub

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

    'hide the maximize and minimize buttons
    Me.FormBorderStyle = Windows.Forms.FormBorderStyle.FixedToolWindow

    'add background image for form
    Me.BackgroundImage = Image.FromFile("D:\My Projects\Library
Management\Wallpaper.jpg")

    'make the ID text box read only
    Me.txt_pub_id.ReadOnly = True

    'make the data grid read only
    Me.dg_publisher.ReadOnly = True

    'enable and disable of buttons
    btn_save_cancel(False)
    btn_switch(True)
    btn_delete_update(False)

    'make other text box(es) read only
    txt_read_only(True)

End Sub

Private Sub btn_add_Click(sender As Object, e As EventArgs) Handles
btn_add.Click

    'show "Auto Number" to user as this text box is a read only text
box
    txt_pub_id.Text = "Auto Number"

    'make other text box(es) can type
    txt_read_only(False)

    'clear text box
    txt_pub_name.Text = ""

    'set focus to text box
    txt_pub_name.Focus()

    'assign value to add_edit
    add_edit = "add"

    'enable and disable of buttons
    btn_switch(False)
    btn_save_cancel(True)
    btn_delete_update(False)

End Sub
```

```

Private Sub btn_save_Click(sender As Object, e As EventArgs) Handles
    btn_save.Click

        'check validation to text boxes
        If validate_fields() = True Then

            'if the variable contains 'add'
            If add_edit = "add" Then

                'get data from text box(es)
                Dim pub_name As String = Trim(txt_pub_name.Text)

                'insert a record to the table
                Dim str_add As String = "INSERT INTO publisher (pub_name)
VALUES ('" & pub_name & "')"

                'create database connection
                Dim cn As New OleDbConnection(dsn_name)
                Dim cmd As New OleDbCommand

                With cmd

                    .CommandText = str_add
                    .Connection = cn
                    .Connection.Open()
                    .ExecuteNonQuery()
                    .Connection.Close()
                    .Dispose()

                End With
                cn.Dispose()

                'show status
                MessageBox.Show("The record is added !", msg_title,
                MessageBoxButtons.OK, MessageBoxIcon.Information)

                'refresh data grid
                btn_show_all_Click(btn_show_all, New EventArgs())

                'if the variable contains 'edit'
            Else

                'get data from text boxes
                Dim pub_id As String = txt_pub_id.Text
                Dim pub_name As String = Trim(txt_pub_name.Text)

                'update record according to specific ID
                Dim str_update As String = "UPDATE publisher SET pub_name =
'" & pub_name & "' WHERE pub_id = " & pub_id

                'create database connection
                Dim cn As New OleDbConnection(dsn_name)
                Dim cmd As New OleDbCommand

                With cmd

                    .CommandText = str_update
                    .Connection = cn
                    .Connection.Open()

```

```

        .ExecuteNonQuery()
        .Connection.Close()
        .Dispose()

    End With
    cn.Dispose()

    'show status
    MessageBox.Show("The record is updated !", msg_title,
    MessageBoxButtons.OK, MessageBoxIcon.Information)

    'refresh data grid
    btn_show_all_Click(btn_show_all, New EventArgs())

End If

Else

    'if the data is not validated then exit this sub routine
    Exit Sub

End If

'enable and disable of buttons
btn_save_cancel(False)
btn_switch(True)
btn_delete_update(False)

'make other text box(es) read only
txt_read_only(True)

'set variable to null
add_edit = ""

End Sub

Private Sub btn_delete_Click(sender As Object, e As EventArgs) Handles
btn_delete.Click

    Dim selected_row_count As Integer =
    dg_publisher.Rows.GetRowCount(DataGridViewElementStates.Selected)

    'if there is no row in table
    If selected_row_count = 0 Then

        'show status
        MessageBox.Show("No records to delete
        !", msg_title, MessageBoxButtons.OK, MessageBoxIcon.Exclamation)

        'enable and disable of buttons
        btn_save_cancel(False)
        btn_switch(True)
        btn_delete_update(False)

        'make other text box(es) read only
        txt_read_only(True)

        'exit this sub routine
        Exit Sub
    
```

```

End If

Try

    'if there is at least one record
    If selected_row_count > 0 Then

        'assign data grid's values to variables
        Dim pub_id As String =
dg_publisher.SelectedRows(0).Cells(0).Value.ToString()
        Dim pub_name As String =
dg_publisher.SelectedRows(0).Cells(1).Value.ToString()

        'show values in text boxes
        txt_pub_id.Text = pub_id
        txt_pub_name.Text = pub_name

    End If

    'user choose a blank row in data grid view to perform operation
Catch ex As Exception

    MessageBox.Show("Error !!!" & vbCrLf & _
        "Choose a valid record !", msg_title,
    MessageBoxButtons.OK, MessageBoxIcon.Error)

    'make other text box(es) read only
    txt_read_only(True)

    'enable and disable of buttons
    btn_save_cancel(False)
    btn_switch(True)
    btn_delete_update(True)

    'exit this sub routine
    Exit Sub

End Try

'ask confirmation to delete
If (MessageBox.Show("Are you sure you want to delete this " & _
    "record ?", msg_title, MessageBoxButtons.YesNo,
    MessageBoxIcon.Question) = vbYes) Then

    Dim pub_id As String = txt_pub_id.Text

    'create database connection
    Dim cn As New OleDbConnection(dsn_name)
    Dim cmd As New OleDbCommand

    With cmd

        'delete the specific record according to ID
        .CommandText = "DELETE FROM publisher WHERE pub_id = " &
pub_id

        .Connection = cn
        .Connection.Open()
    End With
End If

```

```

        .ExecuteNonQuery()
        .Connection.Close()
        .Dispose()

    End With
    cn.Dispose()

    'show status
    MessageBox.Show("The record is deleted !", msg_title,
    MessageBoxButtons.OK, MessageBoxIcon.Exclamation)

    'clear text box
    txt_pub_id.Text = ""
    txt_pub_name.Text = ""

    'refresh data grid
    btn_show_all_Click(btn_show_all, New EventArgs())

Else

    MessageBox.Show("The record is not deleted !", msg_title,
    MessageBoxButtons.OK, MessageBoxIcon.Information)

End If

'make other text box(es) read only
txt_read_only(True)

'enable and disable of buttons
btn_save_cancel(False)
btn_switch(True)
btn_delete_update(False)

End Sub

Private Sub btn_update_Click(sender As Object, e As EventArgs) Handles
btn_update.Click

    Try

        Dim selected_row_count As Integer =
dg_publisher.Rows.GetRowCount(DataGridViewElementStates.Selected)

        If selected_row_count > 0 Then

            'assign data grid's values to variables
            Dim pub_id As String =
dg_publisher.SelectedRows(0).Cells(0).Value.ToString()
            Dim pub_name As String =
dg_publisher.SelectedRows(0).Cells(1).Value.ToString()

            'show values in text boxes
            txt_pub_id.Text = pub_id
            txt_pub_name.Text = pub_name

        End If

        'user choose a blank row in data grid view to perform operation
    Catch ex As Exception

```



```
        MessageBox.Show("Error !!!" & vbNewLine & _
                        "Choose a valid record !", msg_title,
        MessageBoxButtons.OK, MessageBoxIcon.Error)

        'make other text box(es) read only
        txt_read_only(True)

        'enable and disable of buttons
        btn_save_cancel(False)
        btn_switch(True)
        btn_delete_update(True)

        'exit this sub routine
        Exit Sub

    End Try

    'make other text box(es) can type
    txt_read_only(False)

    txt_pub_name.Focus()

    'assign 'edit' in variable
    add_edit = "edit"

    'enable and disable of buttons
    btn_save_cancel(True)
    btn_switch(False)
    btn_delete_update(False)

End Sub

Private Sub btn_switch(ByVal func As Boolean)

    'boolean sub routine for buttons enable and disable

    btn_add.Enabled = func
    btn_show_all.Enabled = func
    btn_back_to_main.Enabled = func

End Sub

Private Sub btn_save_cancel(ByVal func As Boolean)

    'boolean sub routine for buttons enable and disable
    btn_save.Enabled = func
    btn_cancel.Enabled = func

End Sub

Private Sub btn_cancel_Click(sender As Object, e As EventArgs) Handles
    btn_cancel.Click

    'clear text boxes
    txt_pub_id.Text = ""
    txt_pub_name.Text = ""

    'make other text box(es) read only
```

```

        txt_read_only(True)

        'buttons enable and disable
        btn_save_cancel(False)
        btn_switch(True)
        btn_delete_update(False)

    End Sub

    Private Sub btn_delete_update(ByVal func As Boolean)

        'boolean sub routine for buttons enable and disable
        btn_delete.Enabled = func
        btn_update.Enabled = func

    End Sub

    Private Function validate_fields() As Boolean

        'check validation of data entry
        If Trim(txt_pub_name.Text) = "" Then

            MessageBox.Show("Name cannot be empty !", msg_title,
                MessageBoxButtons.OK, MessageBoxIcon.Error)

            'make other text box(es) can type
            txt_read_only(False)

            txt_pub_name.Focus()

            Return False

        End If

        Return True

    End Function

    Private Sub txt_read_only(ByVal func As Boolean)

        'make other text box(es) read only
        txt_pub_name.ReadOnly = func

    End Sub

End Class

```

### **frm transaction.vb**

```

Imports System
Imports System.Data
Imports System.Data.OleDb

Public Class frm_transaction

```

```

'define path to database
Public dsn_name As String = "Provider=Microsoft.ACE.OLEDB.12.0;Data
Source= D:\\My Projects\\" & _
                        "Library Management\\library.accdb"

'initialize variable
Dim add_edit As String = ""
Dim msg_title As String = "Library Management System"

Private Sub btn_switch(ByVal func As Boolean)

    'boolean sub routine for buttons enable and disable

    btn_add.Enabled = func
    btn_show_all.Enabled = func
    btn_back_to_main.Enabled = func

End Sub

Private Sub btn_save_cancel(ByVal func As Boolean)

    'boolean sub routine for buttons enable and disable
    btn_save.Enabled = func
    btn_cancel.Enabled = func

End Sub

Private Sub btn_delete_update(ByVal func As Boolean)

    'boolean sub routine for buttons enable and disable
    btn_delete.Enabled = func
    btn_update.Enabled = func

End Sub

Private Sub clear_textbox()

    'clear text boxes and reset
    dt_borrow_date.ResetText()
    dt_due_date.ResetText()
    cbo_status.Text = cbo_status.Items(0).ToString

End Sub

Private Sub txt_read_only(ByVal func As Boolean)

    'make other text box(es) read only
    cbo_mem_id.Enabled = Not (func)
    cbo_b_id.Enabled = Not (func)
    dt_borrow_date.Enabled = Not (func)
    dt_due_date.Enabled = Not (func)
    cbo_status.Enabled = Not (func)

End Sub

Private Sub assign_data_show_values()

    'assign data grid's values to variables

```

```

        Dim tran_id As String =
dg_tran.SelectedRows(0).Cells(0).Value.ToString()
        Dim mem_id As String =
dg_tran.SelectedRows(0).Cells(1).Value.ToString()
        Dim b_id As String =
dg_tran.SelectedRows(0).Cells(2).Value.ToString()
        Dim borrow_date As String =
dg_tran.SelectedRows(0).Cells(3).Value.ToString()
        Dim due_date As String =
dg_tran.SelectedRows(0).Cells(4).Value.ToString()
        Dim status As String =
dg_tran.SelectedRows(0).Cells(5).Value.ToString()

        'show values in text boxes
txt_tran_id.Text = tran_id
cbo_mem_id.Text = mem_id
cbo_b_id.Text = b_id
dt_borrow_date.Value = borrow_date
dt_due_date.Value = due_date
cbo_status.Text = status

    End Sub

    Private Sub btn_back_to_main_Click(sender As Object, e As EventArgs)
Handles btn_back_to_main.Click

        'hide current form and show main form
Me.Hide()
frm_main.Show()

    End Sub

    Private Sub btn_show_all_Click(sender As Object, e As EventArgs)
Handles btn_show_all.Click

        'create the database connection
Dim cn As New OleDbConnection(dsn_name)

        'create the select SQL
Dim da As New OleDbDataAdapter("SELECT tran_id AS [Transaction
ID],mem_id AS [Member ID],b_id AS [Book ID]," & _
                                "borrow_date AS [Borrow
Date],due_date AS [Due Date],status AS [Book Status]" & _
                                "FROM [transaction] ORDER BY
tran_id", cn)

        Dim dt As New DataTable

        da.Fill(dt)
        da.Dispose()
        cn.Dispose()
        dg_tran.DataSource = dt

        'enable and disable of buttons
btn_save_cancel(False)
btn_switch(True)
btn_delete_update(True)

        'make other text box(es) read only

```

```

        txt_read_only(True)

    End Sub

    Private Sub frm_transaction_FormClosed(sender As Object, e As
FormClosedEventArgs) Handles Me.FormClosed

        'show the main form if the user close current form
        frm_main.Show()

    End Sub

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

        'hide the maximize and minimize buttons
        Me.FormBorderStyle = Windows.Forms.FormBorderStyle.FixedToolWindow

        'add background image for form
        Me.BackgroundImage = Image.FromFile("D:\My Projects\Library
Management\Wallpaper.jpg")

        'make the ID text box read only
        Me.txt_tran_id.ReadOnly = True

        'make the data grid read only
        Me.dg_tran.ReadOnly = True

        'to take member ID from member table
        'create the database connection
        Dim cn As New OleDbConnection(dsn_name)

        'create the select SQL
        Dim da_mem As New OleDbDataAdapter("SELECT mem_id FROM member ORDER
BY mem_id", cn)
        Dim dt_mem As New DataTable

        da_mem.Fill(dt_mem)
        da_mem.Dispose()
        cn.Dispose()
        cbo_mem_id.DataSource = dt_mem
        cbo_mem_id.DisplayMember = "mem_id"

        'to take book ID from book table
        'create the database connection
        Dim con As New OleDbConnection(dsn_name)

        'create the select SQL
        Dim dat As New OleDbDataAdapter("SELECT b_id FROM book ORDER BY
b_id", con)
        Dim tab As New DataTable

        dat.Fill(tab)
        dat.Dispose()
        con.Dispose()
        cbo_b_id.DataSource = tab
        cbo_b_id.DisplayMember = "b_id"

```

```

        'add items to status combo box
        cbo_status.Items.Clear()
        cbo_status.Items.Add("On Loan")
        cbo_status.Items.Add("Available")
        cbo_status.Items.Add("Lost")
        cbo_status.Items.Add("Damaged")

        cbo_status.Text = cbo_status.Items(0).ToString

        'enable and disable of buttons
        btn_save_cancel(False)
        btn_switch(True)
        btn_delete_update(False)

        'make other text box(es) read only
        txt_read_only(True)

    End Sub

    Private Sub btn_add_Click(sender As Object, e As EventArgs) Handles
btn_add.Click

        'show "Auto Number" to user as this text box is a read only text
box
        txt_tran_id.Text = "Auto Number"

        'clear text box(es) and reset date
        clear_textbox()

        'make other text box(es) can type
        txt_read_only(False)

        'set focus to text box
        cbo_mem_id.Focus()

        'assign value to add_edit
        add_edit = "add"

        'enable and disable of buttons
        btn_switch(False)
        btn_save_cancel(True)
        btn_delete_update(False)

    End Sub

    Private Sub btn_update_Click(sender As Object, e As EventArgs) Handles
btn_update.Click

        Try

            Dim selected_row_count As Integer =
dg_tran.Rows.GetRowCount(DataGridViewElementStates.Selected)

            If selected_row_count > 0 Then

                'assign data grid's values to variables and show values in
text boxes
                assign_data_show_values()
            End If
        Catch ex As Exception
            MessageBox.Show(ex.Message)
        End Try
    End Sub

```

```

End If

' user choose a blank row in data grid view to perform operation
Catch ex As Exception

    MessageBox.Show("Error !!!" & vbNewLine & _
        "Choose a valid record !", msg_title,
        MessageBoxButtons.OK, MessageBoxIcon.Error)

    ' make other text box(es) read only
    txt_read_only(True)

    ' enable and disable of buttons
    btn_save_cancel(False)
    btn_switch(True)
    btn_delete_update(True)

    ' exit this sub routine
    Exit Sub

End Try

' make other text box(es) can type
txt_read_only(False)

cbo_mem_id.Focus()

' assign 'edit' in variable
add_edit = "edit"

' enable and disable of buttons
btn_save_cancel(True)
btn_switch(False)
btn_delete_update(False)

End Sub

Private Sub btn_save_Click(sender As Object, e As EventArgs) Handles
    btn_save.Click

    ' if the variable contains 'add'
    If add_edit = "add" Then

        ' get data from text box(es)
        Dim mem_id As String = cbo_mem_id.Text
        Dim b_id As String = cbo_b_id.Text
        Dim borrow_date As String =
            dt_borrow_date.Value.ToString("dd/MM/yyyy")
        Dim due_date As String =
            dt_due_date.Value.ToString("dd/MM/yyyy")
        Dim status As String = cbo_status.Text

        ' insert a record to the table
        Dim str_add As String = "INSERT INTO [transaction]
            (mem_id,b_id,borrow_date,due_date,status) " & _
            "VALUES (" & mem_id & "," & b_id & ",#"
            & borrow_date & "#,#" & due_date & _
            "#,'" & status & "')"
    End If
End Sub

```

```

'create database connection
Dim cn As New OleDbConnection(dsn_name)
Dim cmd As New OleDbCommand

With cmd

    .CommandText = str_add
    .Connection = cn
    .Connection.Open()
    .ExecuteNonQuery()
    .Connection.Close()
    .Dispose()

End With
cn.Dispose()

'show status
MessageBox.Show("The record is added !", msg_title,
MessageBoxButtons.OK, MessageBoxIcon.Information)

'refresh data grid
btn_show_all_Click(btn_show_all, New EventArgs())

'if the variable contains 'edit'
Else

    'get data from text boxes
    Dim tran_id As String = txt_tran_id.Text
    Dim mem_id As String = cbo_mem_id.Text
    Dim b_id As String = cbo_b_id.Text
    Dim borrow_date As String =
dt_borrow_date.Value.ToString("dd/MM/yyyy")
    Dim due_date As String =
dt_due_date.Value.ToString("dd/MM/yyyy")
    Dim status As String = cbo_status.Text

    'update record according to specific ID
    Dim str_update As String = "UPDATE [transaction] SET mem_id = "
& mem_id & ", b_id = " & b_id & _
                                ", borrow_date = #" & borrow_date &
"#, due_date = #" & due_date & _
                                "#, status = '" & status & "' WHERE
tran_id = " & tran_id

    'create database connection
    Dim cn As New OleDbConnection(dsn_name)
    Dim cmd As New OleDbCommand

    With cmd

        .CommandText = str_update
        .Connection = cn
        .Connection.Open()
        .ExecuteNonQuery()
        .Connection.Close()
        .Dispose()

    End With
    cn.Dispose()

```



```

        'show status
        MessageBox.Show("The record is updated !", msg_title,
        MessageBoxButtons.OK, MessageBoxIcon.Information)

        'refresh data grid
        btn_show_all_Click(btn_show_all, New EventArgs())

    End If

    'enable and disable of buttons
    btn_save_cancel(False)
    btn_switch(True)
    btn_delete_update(False)

    'make other text box(es) read only
    txt_read_only(True)

    'set variable to null
    add_edit = ""

End Sub

Private Sub btn_delete_Click(sender As Object, e As EventArgs) Handles
btn_delete.Click

    Dim selected_row_count As Integer =
    dg_tran.Rows.GetRowCount(DataGridViewElementStates.Selected)

    'if there is no row in table
    If selected_row_count = 0 Then

        'show status
        MessageBox.Show("No records to delete !", msg_title,
        MessageBoxButtons.OK, MessageBoxIcon.Exclamation)

        'enable and disable of buttons
        btn_save_cancel(False)
        btn_switch(True)
        btn_delete_update(False)

        'make other text box(es) read only
        txt_read_only(True)

        'exit this sub routine
        Exit Sub

    End If

    Try

        'if there is at least one record
        If selected_row_count > 0 Then

            'assign data and show values in text boxes
            assign_data_show_values()

        End If

    End Try

```

```

        'user choose a blank row in data grid view to perform operation
Catch ex As Exception

    MessageBox.Show("Error !!!" & vbNewLine & _
        "Choose a valid record !", msg_title,
    MessageBoxButtons.OK, MessageBoxIcon.Error)

    'make other text box(es) read only
    txt_read_only(True)

    'enable and disable of buttons
    btn_save_cancel(False)
    btn_switch(True)
    btn_delete_update(True)

    'exit this sub routine
    Exit Sub

End Try

'ask confirmation to delete
If (MessageBox.Show("Are you sure you want to delete " & _
    "this record ?", msg_title,
    MessageBoxButtons.YesNo, MessageBoxIcon.Question) = vbYes) Then

    Dim tran_id As String = txt_tran_id.Text

    'create database connection
    Dim cn As New OleDbConnection(dsn_name)
    Dim cmd As New OleDbCommand

    With cmd

        'delete the specific record according to ID
        .CommandText = "DELETE FROM [transaction] WHERE tran_id = "
        & tran_id

        .Connection = cn
        .Connection.Open()
        .ExecuteNonQuery()
        .Connection.Close()
        .Dispose()

    End With
    cn.Dispose()

    'show status
    MessageBox.Show("The record is deleted !", msg_title,
    MessageBoxButtons.OK, MessageBoxIcon.Exclamation)

    'clear text box(es)
    txt_tran_id.Text = ""
    clear_textbox()

    'refresh data grid
    btn_show_all_Click(btn_show_all, New EventArgs())

Else

```

```
        MessageBox.Show("The record is not deleted !", msg_title,
        MessageBoxButtons.OK, MessageBoxIcon.Information)

    End If

    'enable and disable of buttons
    btn_save_cancel(False)
    btn_switch(True)
    btn_delete_update(False)

    'make other text box(es) read only
    txt_read_only(True)

End Sub

Private Sub btn_cancel_Click(sender As Object, e As EventArgs) Handles
btn_cancel.Click

    'clear text boxes
    txt_tran_id.Text = ""
    clear_textbox()

    'buttons enable and disable
    btn_save_cancel(False)
    btn_switch(True)
    btn_delete_update(False)

    'make other text box(es) read only
    txt_read_only(True)

End Sub

End Class
```

## 4. TESTING

---

### 4.1 test plan

| Test Cases | Description   |
|------------|---|
| 1          | To check the database is linked to the program  |
| 2          | To check text boxes cleared and cursor ready for entry pressing "Add"                       |
| 3          | To check specific record can be updated pressing "Update"                                   |
| 4          | To show message of "The record is added." pressing "Save" to add new record                 |
| 5          | To check the new record is added and show in data grid pressing OK                          |
| 6          | To show message of "The record is updated." pressing "Save" to add update a specific record |
| 7          | To check the specific record is updated and show in data grid pressing OK                   |
| 8          | To check current action is cancelled and clear text boxes pressing "Cancel"                 |
| 9          | To show confirm message to delete a record pressing "Delete"                                |
| 10         | To show message that record is not deleted user press No on confirm to delete message       |
| 11         | To show message that record is deleted user press Yes on confirm to delete                  |
| 12         | To show error message when updating the blank record in data grid                           |
| 13         | To show error message when deleting the blank record in data grid                           |
| 14         | To show error message when adding character values to "Maximum Items" field                 |
| 15         | To show error message when adding blank field   |
| 16         | To hide current form and show Main when pressing "Back To Main Form"                        |

## 4.2 test cases

|                 |  |
|-----------------|--|
| Test Case       | 1  |
| Description     | To check the database is linked to the program |
| Test Data       | Press “Show all” button                        |
| Expected Result | To show all the records in data grid           |
| Actual Result   | As shown below                                 |
| Conclusion      | Successful                                     |

Before:

Book Information

Book ID

Book Title

Author's Name

Description

Category ID 1

Publisher ID 16

ISBN

Purchasing Price

Purchasing Date 28/03/2014

Add Update

Show All Delete

Save Cancel

Back To Main Form

After:

Book Information

Book Information
+

Book ID

Book Title

Author's Name

Description

Category ID

Publisher ID

ISBN

Purchasing Price

Purchasing Date

|   | Book ID | Title                | Author         | Description         | Category ID | Publisher ID | ISBN No   |
|---|---------|----------------------|----------------|---------------------|-------------|--------------|-----------|
| ▶ | 1       | Learn German         | Joe Stanley    | Language Learning   | 1           | 1            | 123-45678 |
|   | 2       | Rich Dad Poor D...   | R.Kiyosaki     | Financial           | 2           | 16           | 231-45678 |
|   | 3       | VB.NET Step By ...   | R.Simon        | Technological bo... | 3           | 1            | 231-56778 |
|   | 4       | Increase your fin... | R.Kiyosaki     | Financial book      | 2           | 18           | 124-56789 |
|   | 5       | Learn Thai Lang...   | Stanley Mathew | Language Learning   | 1           | 18           | 123-09890 |
| * |         |                      |                |                     |             |              |           |

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|                 |   |
|-----------------|---|
| Test Case       | 2   |
| Description     | To check text boxes cleared and cursor ready for entry pressing “Add”     |
| Test Data       | Press “Add” button  |
| Expected Result | Clear text boxes show “Auto Number” in ID box, and cursor ready for entry |
| Actual Result   | As shown below  |
| Conclusion      | Successful  |

Book Information

Book ID: Auto Number

Book Title:

Author's Name:

Description:

Category ID: 1

Publisher ID: 16

ISBN:

Purchasing Price:

Purchasing Date: 28/03/2014

Add Update

Show All Delete

Save Cancel

Back To Main Form



|                 |  |
|-----------------|--|
| Test Case       | 3  |
| Description     | To check specific record can be updated pressing “Update”    |
| Test Data       | Press “Update” button  |
| Expected Result | Show selected record’s data in text boxes ready for updating |
| Actual Result   | As shown below   |
| Conclusion      | Successful   |

Member Information

Member ID: 4

Member Name: David Schwarz

IC No: G1234567Q

Address: Blk 23, ddfdfsf, fdfdfsd

Phone: 1237890

Registration Date: 03/04/2014

Expiry Date: 03/05/2015

Maximum Items: 8

Buttons: Add, Update, Show All, Delete, Save, Cancel

| Member ID | Member Name   | IC No      | Address                | Phone    | Registration Date | Expiry    |
|-----------|---------------|------------|------------------------|----------|-------------------|-----------|
| 1         | Myo Thet Tun  | G1234567Q  | Blk 123 Sembaw...      | 12345678 | 08/01/2014        | 09/01/... |
| 2         | Naing Win     | G7654321Q  | Blk 234 Yishun         | 87654321 | 02/02/2014        | 02/03/... |
| 3         | Jack Ho       | S7654321F  | Blk 255 Ang Mo ...     | 68765431 | 12/01/2014        | 13/01/... |
| 4         | David Schwarz | G1234567Q  | Blk 23, ddfdfsf fdf... | 1237890  | 03/04/2014        | 03/05/... |
| 5         | Simon Tun     | G45678945Q | Blk 223, Jurong ...    | 90903456 | 09/01/2013        | 31/08/... |
| 6         | Joseph        | S1234567H  | Blk 123, Bishun ...    | 12348756 | 04/06/2014        | 04/01/... |
| 8         | fdfdf         | fdfdfd     | fdfdfdf                | fdfdfdf  | 13/03/2014        | 03/03/... |

Back To Main Form



|                 |  |
|-----------------|--|
| Test Case       | 4  |
| Description     | To show message of “The record is added.” pressing “Save” to add new record                                  |
| Test Data       | Press “Save” button  |
| Expected Result | Show message to user that the record has been added when pressing “Save” after typing new data in text boxes |
| Actual Result   | As shown below   |
| Conclusion      | Successful   |

Before:

Category Information

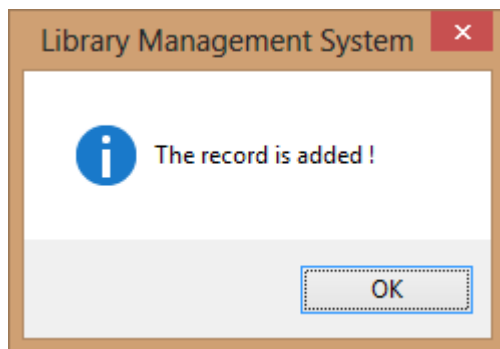
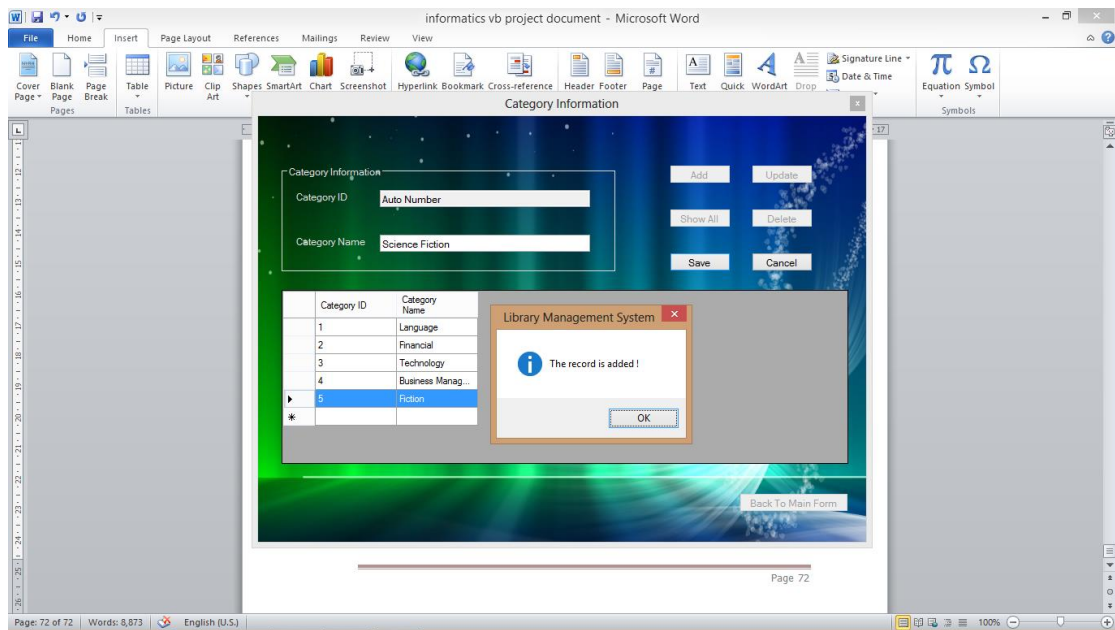
Category ID: Auto Number

Category Name: Fiction

Buttons: Add, Update, Show All, Delete, Save, Cancel

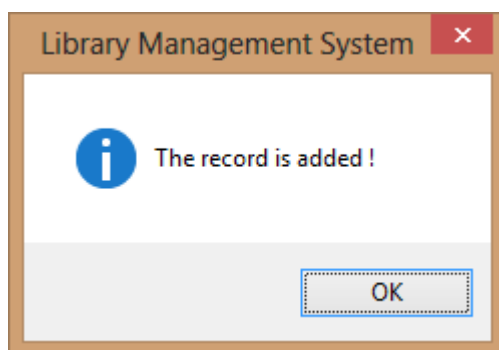
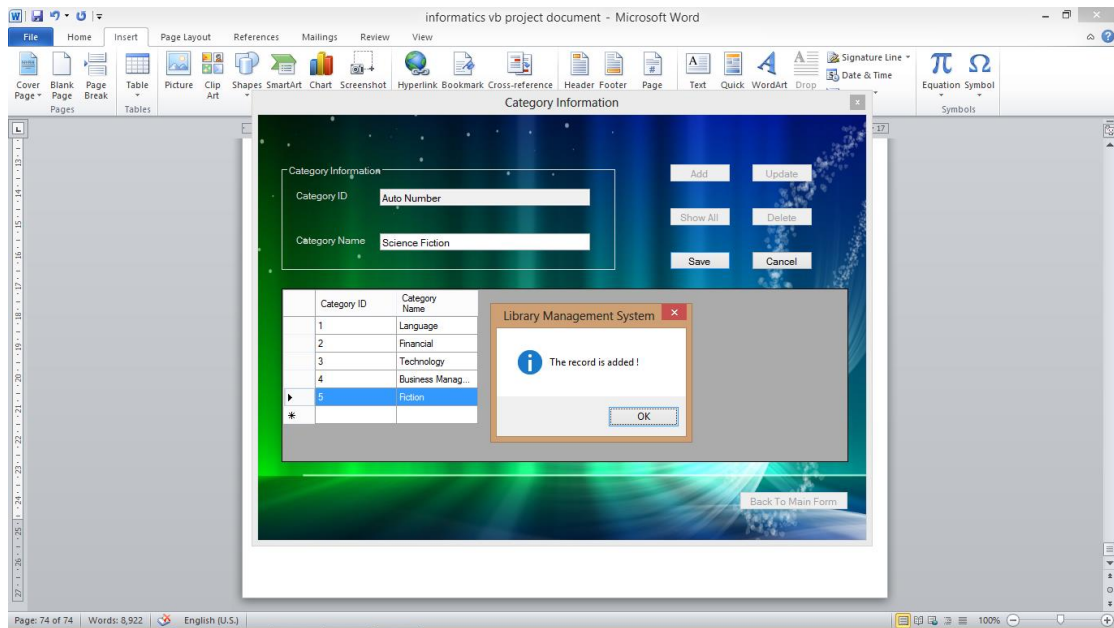
Back To Main Form

After:



|                 |  |
|-----------------|--|
| Test Case       | 5  |
| Description     | To check the new record is added and show in data grid pressing OK   |
| Test Data       | Press “OK” button in Message Box   |
| Expected Result | Show message to user that the record has been added when pressing “Save” after typing new data in text boxes |
| Actual Result   | As shown below   |
| Conclusion      | Successful   |

Before:



After:

Category Information

Category Information

Category ID: Auto Number

Category Name: Science Fiction

Add Update

Show All Delete

Save Cancel

|   | Category ID | Category Name     |
|---|-------------|-------------------|
| ▶ | 1           | Language          |
|   | 2           | Financial         |
|   | 3           | Technology        |
|   | 4           | Business Manag... |
|   | 5           | Fiction           |
|   | 6           | Science Fiction   |
| * |             |                   |

Back To Main Form

|                 |   |
|-----------------|---|
| Test Case       | 6   |
| Description     | To show message of “The record is updated.” pressing “Save” to add update a specific record                                 |
| Test Data       | Press “Save” button   |
| Expected Result | Show message to user that the specific record has been updated when pressing “Save” after typing updated data in text boxes |
| Actual Result   | As shown below  |
| Conclusion      | Successful  |

Before:

Member Information

Member Information

Member ID: 4

Member Name: David Schwarz

IC No: G1234567Q

Address: Blk 23, Yishun Ave 1

Phone: 1237890

Registration Date: 03/04/2014

Expiry Date: 03/05/2015

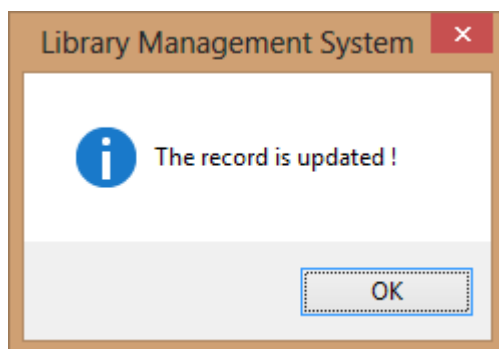
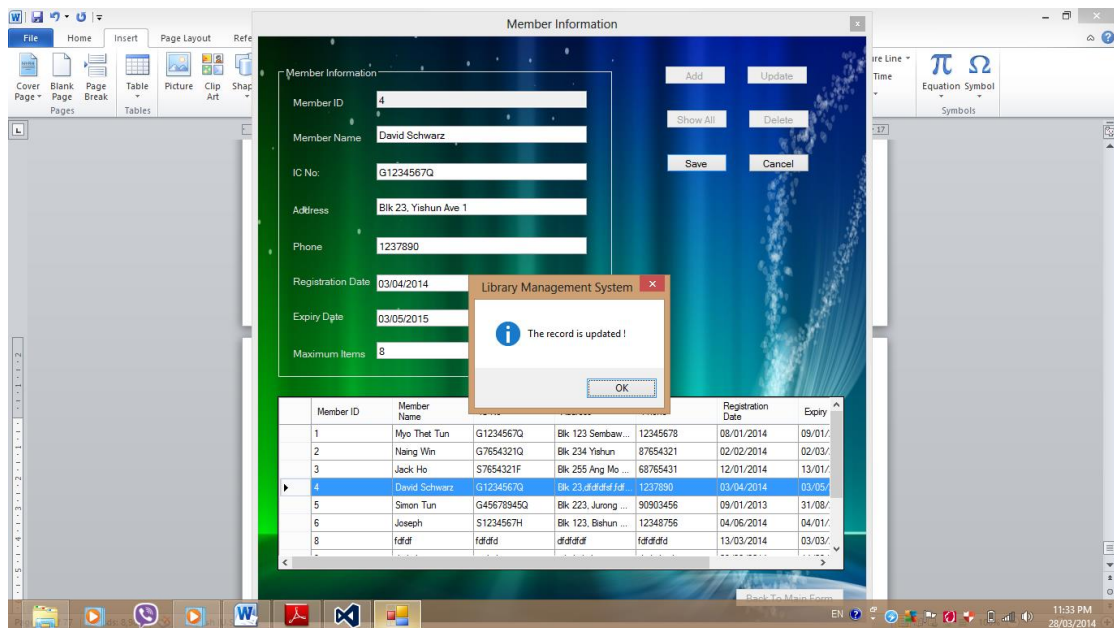
Maximum Items: 8

Buttons: Add, Update, Show All, Delete, Save, Cancel

|   | Member ID | Member Name   | IC No      | Address               | Phone    | Registration Date | Expiry    |
|---|-----------|---------------|------------|-----------------------|----------|-------------------|-----------|
|   | 1         | Myo Thet Tun  | G1234567Q  | Blk 123 Sembaw...     | 12345678 | 08/01/2014        | 09/01/... |
|   | 2         | Naing Win     | G7654321Q  | Blk 234 Yishun        | 87654321 | 02/02/2014        | 02/03/... |
|   | 3         | Jack Ho       | S7654321F  | Blk 255 Ang Mo ...    | 68765431 | 12/01/2014        | 13/01/... |
| ▶ | 4         | David Schwarz | G1234567Q  | Blk 23.dfdffsf.fdf... | 1237890  | 03/04/2014        | 03/05/... |
|   | 5         | Simon Tun     | G45678945Q | Blk 223, Jurong ...   | 90903456 | 09/01/2013        | 31/08/... |
|   | 6         | Joseph        | S1234567H  | Blk 123, Bishun ...   | 12348756 | 04/06/2014        | 04/01/... |
|   | 8         | fdffdf        | fdffdf     | dfdfdfdf              | fdffdfdf | 13/03/2014        | 03/03/... |

Back To Main Form

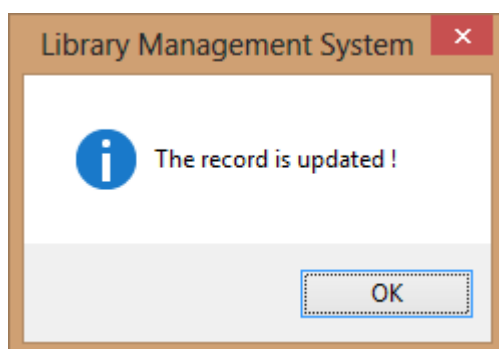
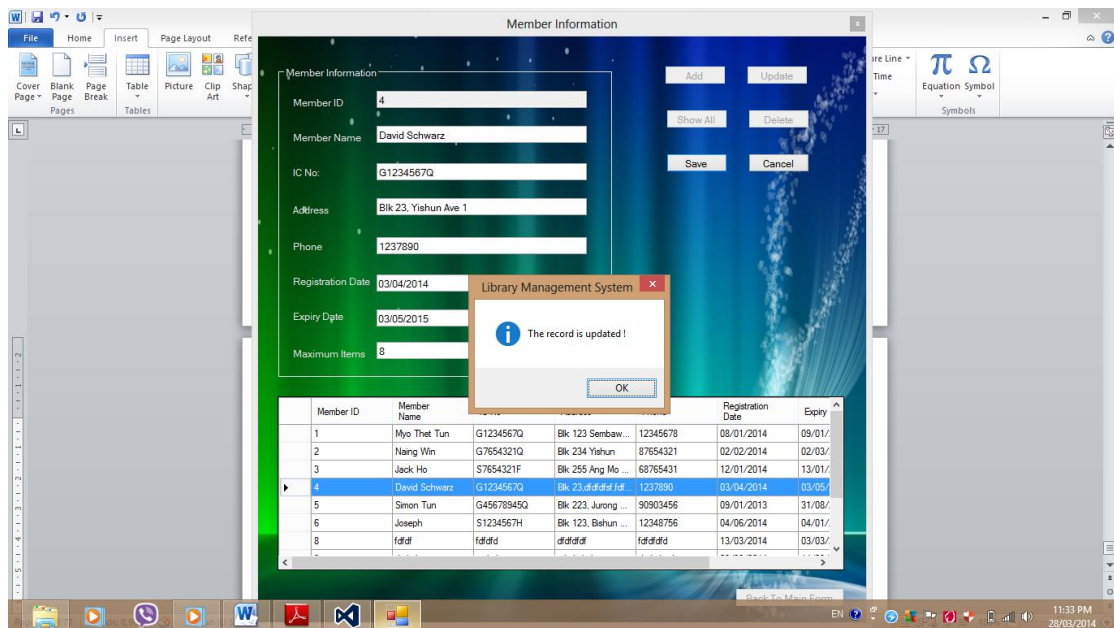
After:





|                 |   |
|-----------------|---|
| Test Case       | 7   |
| Description     | To check the specific record is updated and show in data grid pressing OK |
| Test Data       | Press "OK" button in Message Box  |
| Expected Result | To check the current record is updated and show in data grid pressing OK  |
| Actual Result   | As shown below  |
| Conclusion      | Successful  |

Before:



After:

Member Information

**Member Information**

Member ID:

Member Name:

IC No:

Address:

Phone:

Registration Date:

Expiry Date:

Maximum Items:

|   | Member ID | Member Name   | IC No      | Address             | Phone    | Registration Date | Expiry    |
|---|-----------|---------------|------------|---------------------|----------|-------------------|-----------|
|   | 1         | Myo Thet Tun  | G1234567Q  | Blk 123 Sembaw...   | 12345678 | 08/01/2014        | 09/01/... |
|   | 2         | Naing Win     | G7654321Q  | Blk 234 Yishun      | 87654321 | 02/02/2014        | 02/03/... |
|   | 3         | Jack Ho       | S7654321F  | Blk 255 Ang Mo ...  | 68765431 | 12/01/2014        | 13/01/... |
| ▶ | 4         | David Schwarz | G1234567Q  | Blk 23, Yishun A... | 1237890  | 04/03/2014        | 05/03/... |
|   | 5         | Simon Tun     | G45678945Q | Blk 223, Jurong ... | 90903456 | 09/01/2013        | 31/08/... |
|   | 6         | Joseph        | S1234567H  | Blk 123, Bishun ... | 12348756 | 04/06/2014        | 04/01/... |
|   | 8         | fdfdf         | fdfdfd     | dfdfdfdf            | fdfdfdfd | 13/03/2014        | 03/03/... |



|                 |   |
|-----------------|---|
| Test Case       | 8   |
| Description     | To check current action is cancelled and clear text boxes pressing "Cancel" |
| Test Data       | Press "Cancel" button   |
| Expected Result | To check the current action is cancelled clear text boxes                   |
| Actual Result   | As shown below  |
| Conclusion      | Successful  |

Before:

Member Information

Member ID: 5

Member Name: Simon Tun

IC No: G45678945Q

Address: Blk 223, Jurong West street 52

Phone: 90903456

Registration Date: 09/01/2013

Expiry Date: 31/08/2014

Maximum Items: 8

Buttons: Add, Update, Show All, Delete, Save, Cancel

| Member ID | Member Name   | IC No      | Address             | Phone    | Registration Date | Expiry    |
|-----------|---------------|------------|---------------------|----------|-------------------|-----------|
| 1         | Myo Thet Tun  | G1234567Q  | Blk 123 Sembaw...   | 12345678 | 08/01/2014        | 09/01/... |
| 2         | Naing Win     | G7654321Q  | Blk 234 Yishun      | 87654321 | 02/02/2014        | 02/03/... |
| 3         | Jack Ho       | S7654321F  | Blk 255 Ang Mo ...  | 68765431 | 12/01/2014        | 13/01/... |
| 4         | David Schwarz | G1234567Q  | Blk 23, Yishun A... | 1237890  | 04/03/2014        | 05/03/... |
| 5         | Simon Tun     | G45678945Q | Blk 223, Jurong ... | 90903456 | 09/01/2013        | 31/08/... |
| 6         | Joseph        | S1234567H  | Blk 123, Bishun ... | 12348756 | 04/06/2014        | 04/01/... |
| 8         | fdfdf         | fdfdfd     | dfdfdf              | fdfdfdf  | 13/03/2014        | 03/03/... |

Back To Main Form

After:

Member Information

Member Information

Member ID:

Member Name:

IC No:

Address:

Phone:

Registration Date: 28/03/2014

Expiry Date: 28/03/2014

Maximum Items:

Add Update

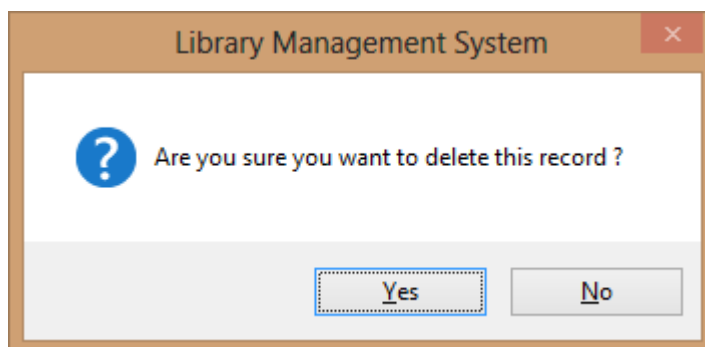
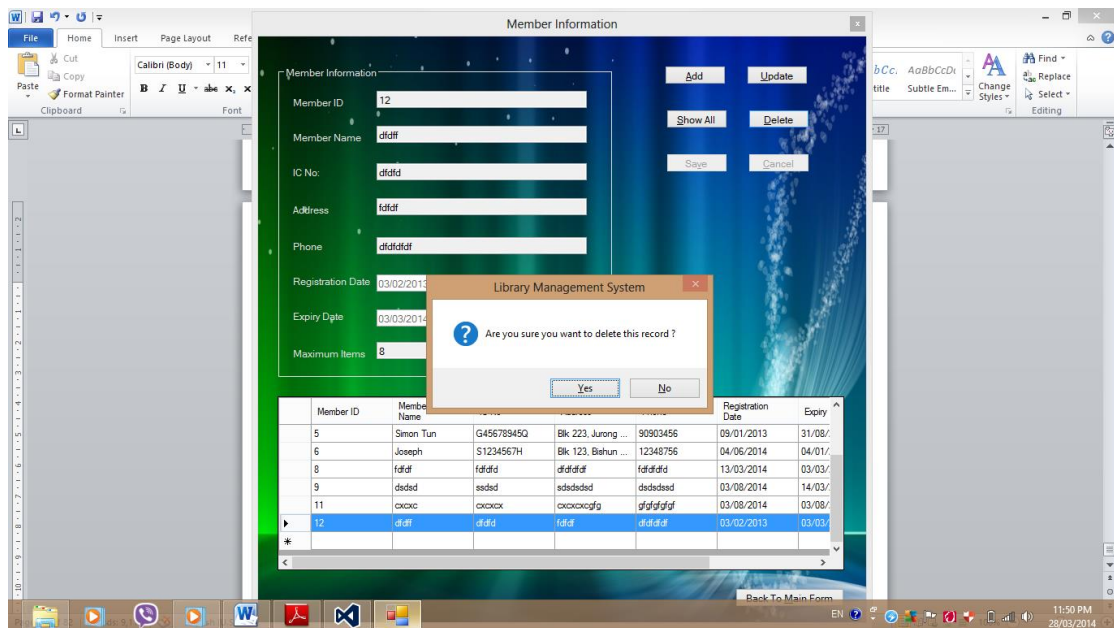
Show All Delete

Save Cancel

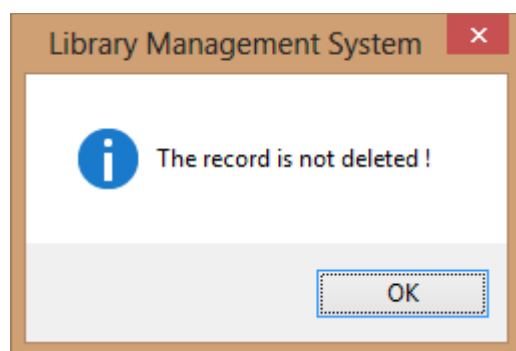
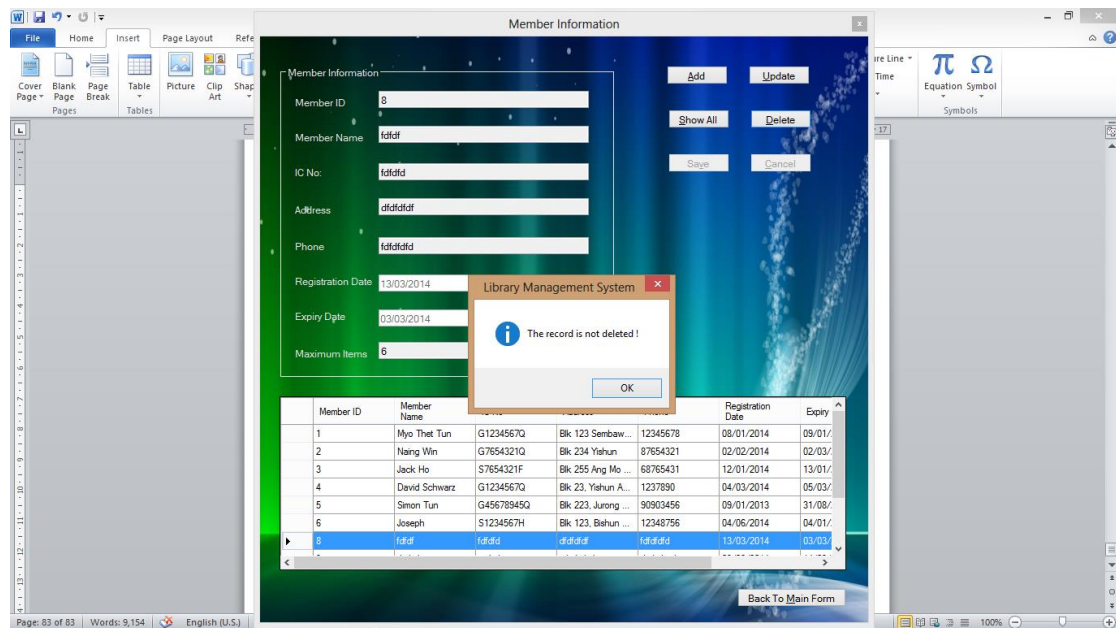
|   | Member ID | Member Name   | IC No      | Address             | Phone    | Registration Date | Expiry    |
|---|-----------|---------------|------------|---------------------|----------|-------------------|-----------|
|   | 1         | Myo Thet Tun  | G1234567Q  | Blk 123 Sembaw...   | 12345678 | 08/01/2014        | 09/01/... |
|   | 2         | Naing Win     | G7654321Q  | Blk 234 Yishun      | 87654321 | 02/02/2014        | 02/03/... |
|   | 3         | Jack Ho       | S7654321F  | Blk 255 Ang Mo ...  | 68765431 | 12/01/2014        | 13/01/... |
|   | 4         | David Schwarz | G1234567Q  | Blk 23, Yishun A... | 1237890  | 04/03/2014        | 05/03/... |
| ▶ | 5         | Simon Tun     | G45678945Q | Blk 223, Jurong ... | 90903456 | 09/01/2013        | 31/08/... |
|   | 6         | Joseph        | S1234567H  | Blk 123, Bishun ... | 12348756 | 04/06/2014        | 04/01/... |
|   | 8         | fdfdf         | fdfdfd     | fdfdfdf             | fdfdfdf  | 13/03/2014        | 03/03/... |

Back To Main Form

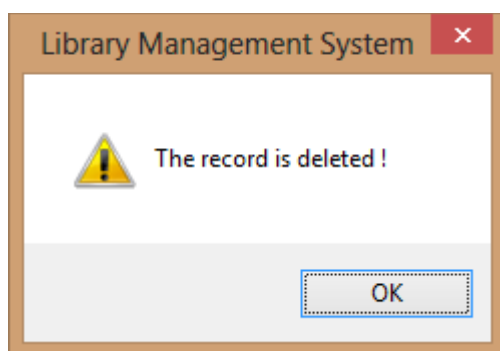
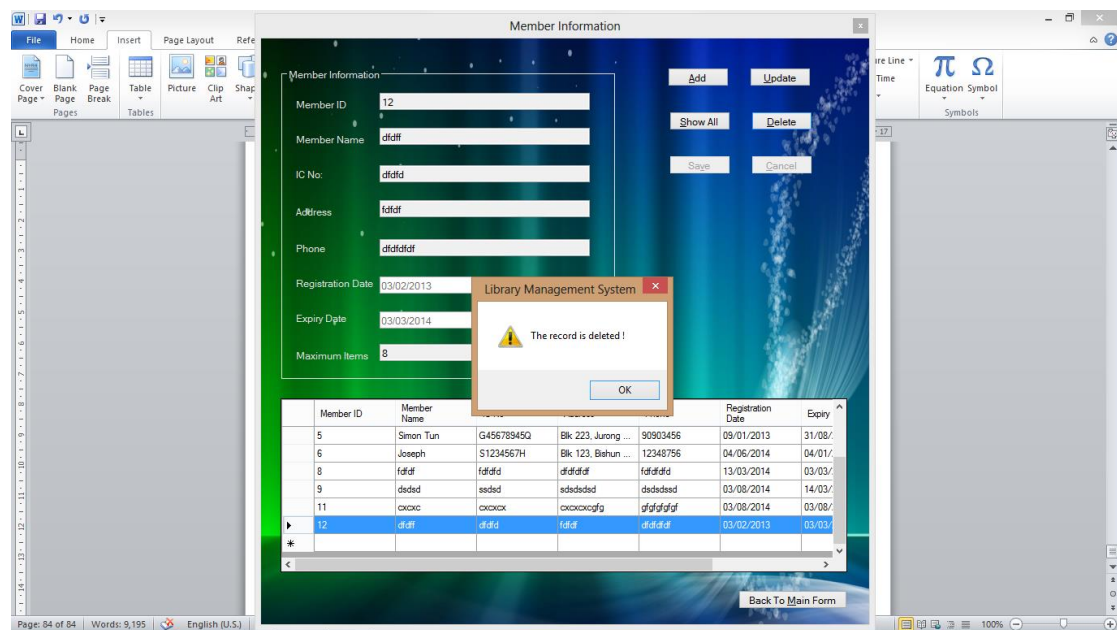
|                 |  |
|-----------------|--|
| Test Case       | 9  |
| Description     | To show confirm message to delete a record pressing “Delete” |
| Test Data       | Press “Delete” button  |
| Expected Result | Show confirm message to user to delete a record              |
| Actual Result   | As shown below   |
| Conclusion      | Successful   |



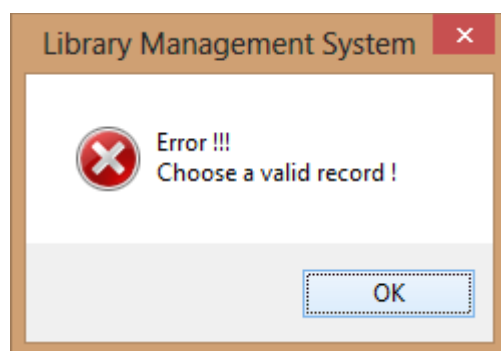
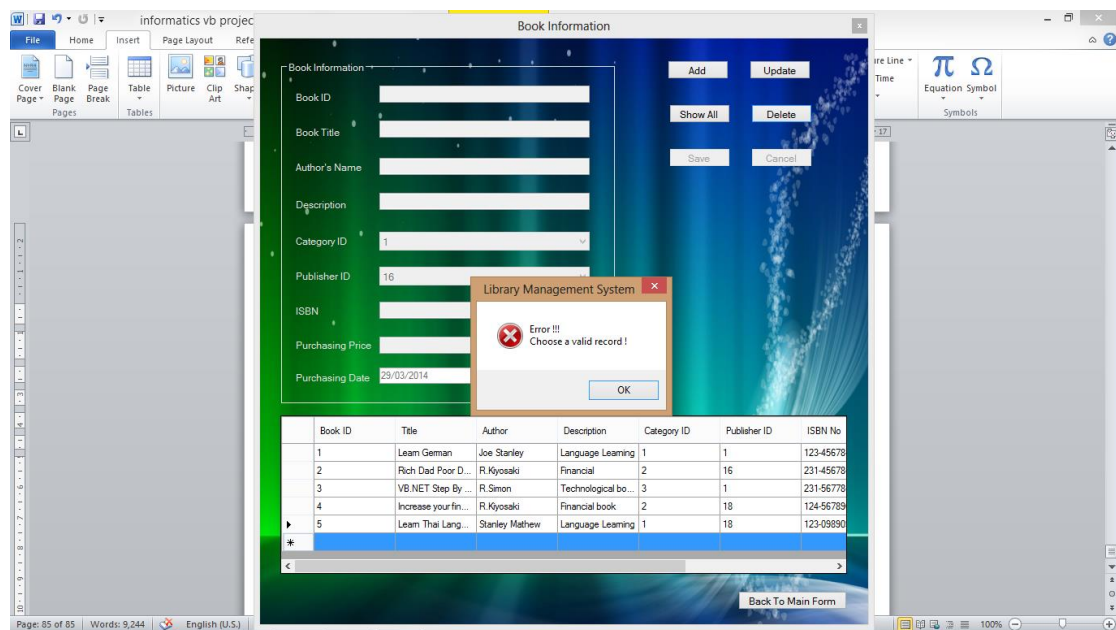
|                 |   |
|-----------------|---|
| Test Case       | 10  |
| Description     | To show message that record is not deleted user press “No” on confirm to delete message |
| Test Data       | Press “No” button in confirm message box  |
| Expected Result | Show “The record is not deleted” message  |
| Actual Result   | As shown below  |
| Conclusion      | Successful  |



|                 |  |
|-----------------|--|
| Test Case       | 11   |
| Description     | To show message that record is deleted user press Yes on confirm to delete |
| Test Data       | Press “Yes” button in confirm message box                                  |
| Expected Result | Show “The record is deleted” message                                       |
| Actual Result   | As shown below   |
| Conclusion      | Successful   |

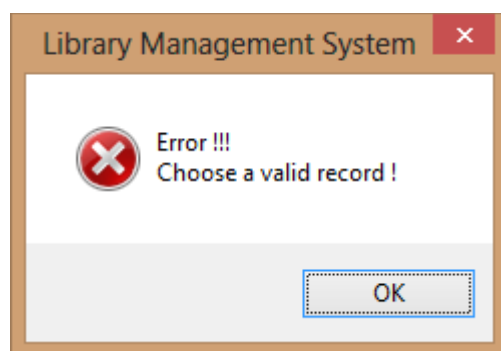
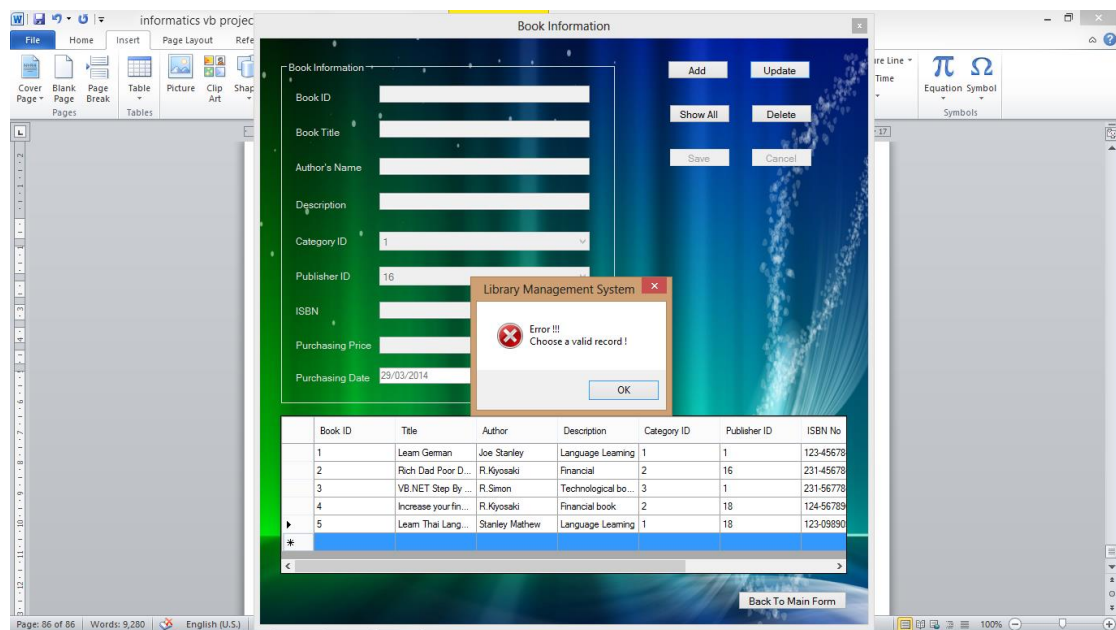


|                 |   |
|-----------------|---|
| Test Case       | 12  |
| Description     | To show error message when deleting the blank record in data grid |
| Test Data       | Press “Delete” button   |
| Expected Result | Show “Error !!! Choose a valid record!” message                   |
| Actual Result   | As shown below  |
| Conclusion      | Successful  |





|                 |   |
|-----------------|---|
| Test Case       | 13  |
| Description     | To show error message when updating the blank record in data grid |
| Test Data       | Press “Update” button   |
| Expected Result | Show “Error !!! Choose a valid record!” message                   |
| Actual Result   | As shown below  |
| Conclusion      | Successful  |



|                 |   |
|-----------------|---|
| Test Case       | 14  |
| Description     | To show error message when adding character values to "Maximum Items" field |
| Test Data       | Press "Save" button   |
| Expected Result | Show "Please enter a valid number !" message                                |
| Actual Result   | As shown below  |
| Conclusion      | Successful  |

Before:

Member Information

Member ID: Auto Number

Member Name: Luis Fernandez

IC No: S1234567D

Address: Blk 245, Ang Mo Kio Ave 5

Phone: 12678989

Registration Date: 01/04/2013

Expiry Date: 31/03/2014

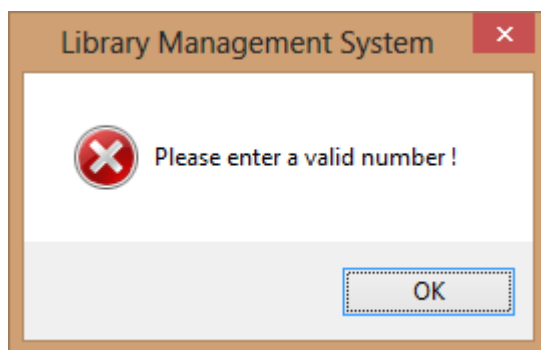
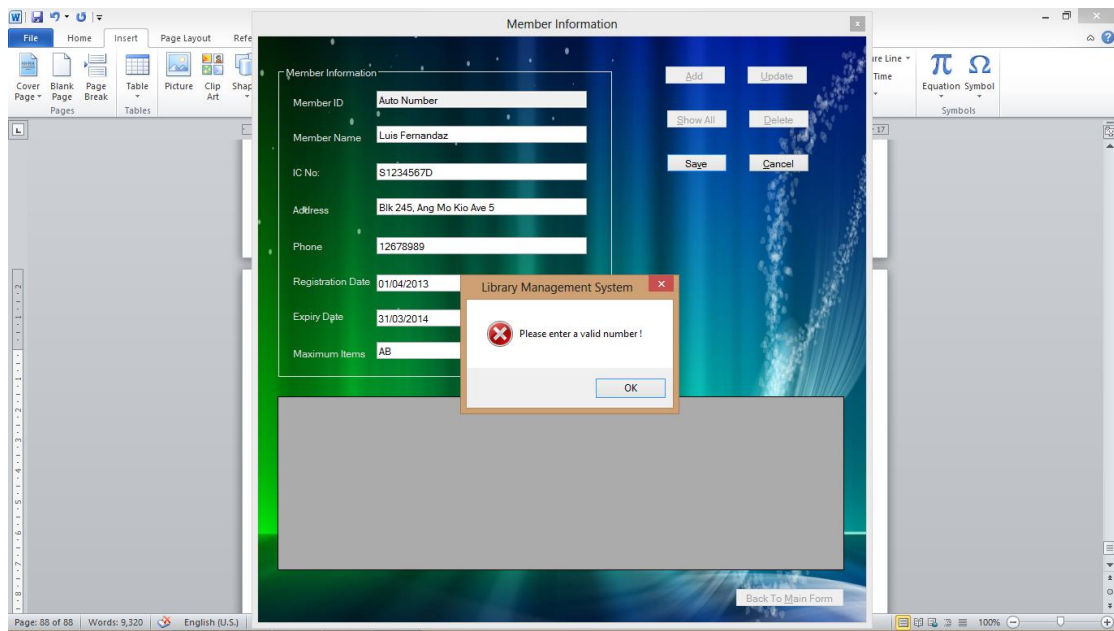
Maximum Items: AB

Buttons: Add, Update, Show All, Delete, Save, Cancel

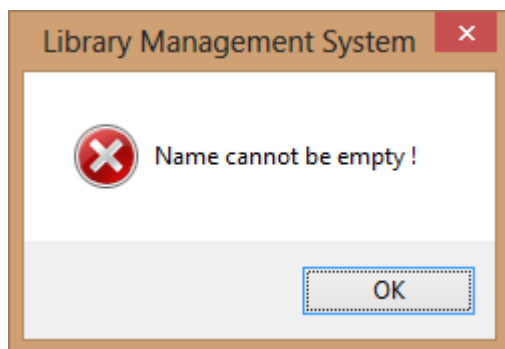
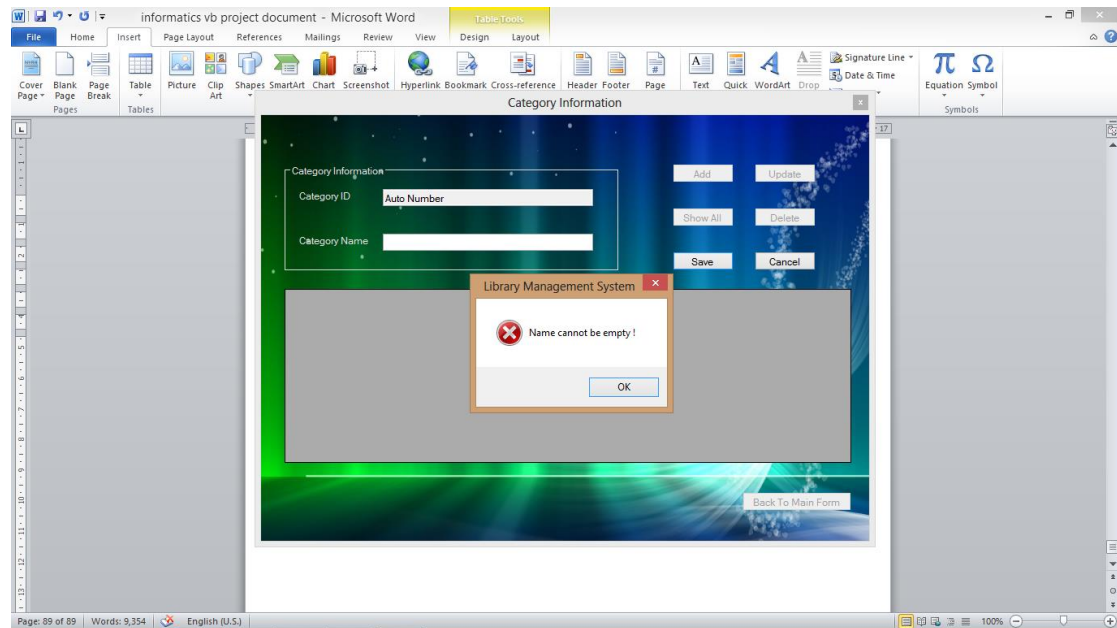
Back To Main Form



After:



|                 |   |
|-----------------|---|
| Test Case       | 15  |
| Description     | To show error message when adding blank field |
| Test Data       | Press “Save” button                           |
| Expected Result | Show “Name cannot be empty !” message         |
| Actual Result   | As shown below                                |
| Conclusion      | Successful                                    |



|                 |  |
|-----------------|--|
| Test Case       | 16   |
| Description     | To hide current form and show Main when pressing “Back To Main Form” |
| Test Data       | Press “Back To Main Form” button                                     |
| Expected Result | Show the main form   |
| Actual Result   | As shown below   |
| Conclusion      | Successful   |

Before:

The screenshot shows a Windows application window titled "Rental Information". The window has a blue and green abstract background. On the left, there is a form titled "Rental Information" with the following fields: "Transaction ID" (text box), "Member ID" (dropdown menu showing "1"), "Book ID" (dropdown menu showing "1"), "Borrow Date" (text box showing "08/03/2014" with a calendar icon), "Due Date" (text box showing "29/03/2014" with a calendar icon), and "Status" (dropdown menu showing "On Loan"). To the right of the form are six buttons: "Add", "Update", "Show All", "Delete", "Save", and "Cancel". At the bottom right of the window is a button labeled "Back To Main Form". A large grey rectangular area is visible below the form, likely representing a data grid or list that is currently hidden or empty.

After:



### 4.3 test results

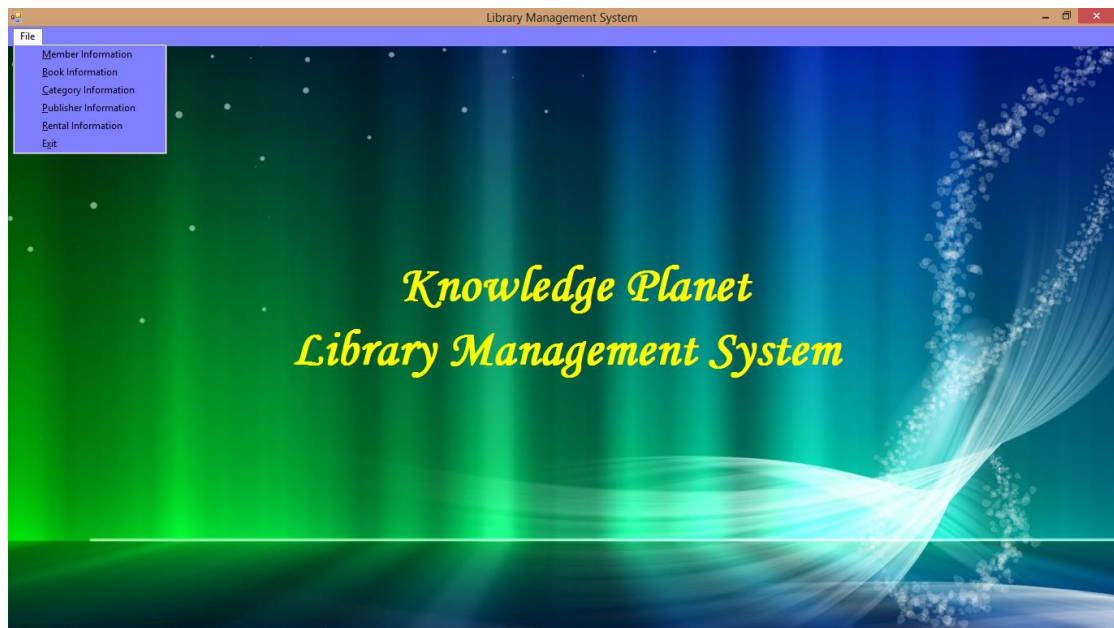
| No. Result |            |
|------------|------------|
| 1          | Successful |
| 2          | Successful |
| 3          | Successful |
| 4          | Successful |
| 5          | Successful |
| 6          | Successful |
| 7          | Successful |
| 8          | Successful |
| 9          | Successful |
| 10         | Successful |
| 11         | Successful |
| 12         | Successful |
| 13         | Successful |
| 14         | Successful |
| 15         | Successful |
| 16         | Successful |

## 5. OPERATING INSTRUCTION

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### 5.1 using the system

When the user opens the program, the user will see the main page as shown below:



User can choose the form from File menu. File menu includes –

**Member Information** – allows user entry to 'Member' page

**Book Information** – allows user entry to 'Book' page

**Category Information** – allows user entry to 'Category' page

**Publisher Information** – allows user entry to 'Publisher' page

**Rental Information** – allows user entry to 'Rental' page

**Exit** – allows user to exit from the program

If user chooses 'Member Information' form, the member form will come up as shown below.

The screenshot shows a Windows application window titled "Member Information". Inside the window, there is a group box labeled "Member Information" containing several text input fields: "Member ID", "Member Name", "IC No.", "Address", "Phone", "Registration Date" (with the value "08/03/2014"), "Expiry Date" (with the value "29/03/2014"), and "Maximum Items". To the right of the group box, there are six buttons arranged in three rows: "Add", "Update", "Show All", "Delete", "Save", and "Cancel". At the bottom right of the window, there is a button labeled "Back To Main Form". The window has a standard Windows title bar with a close button (X) in the top right corner. The background of the window is a blue and green abstract image.

**'Add'** button allows user to add a new record to the database

**'Update'** button shows selected record in text boxes and let user to correct the data

**'Show All'** button allows user to view all records in data grid

**'Delete'** button allows user to delete the selected record

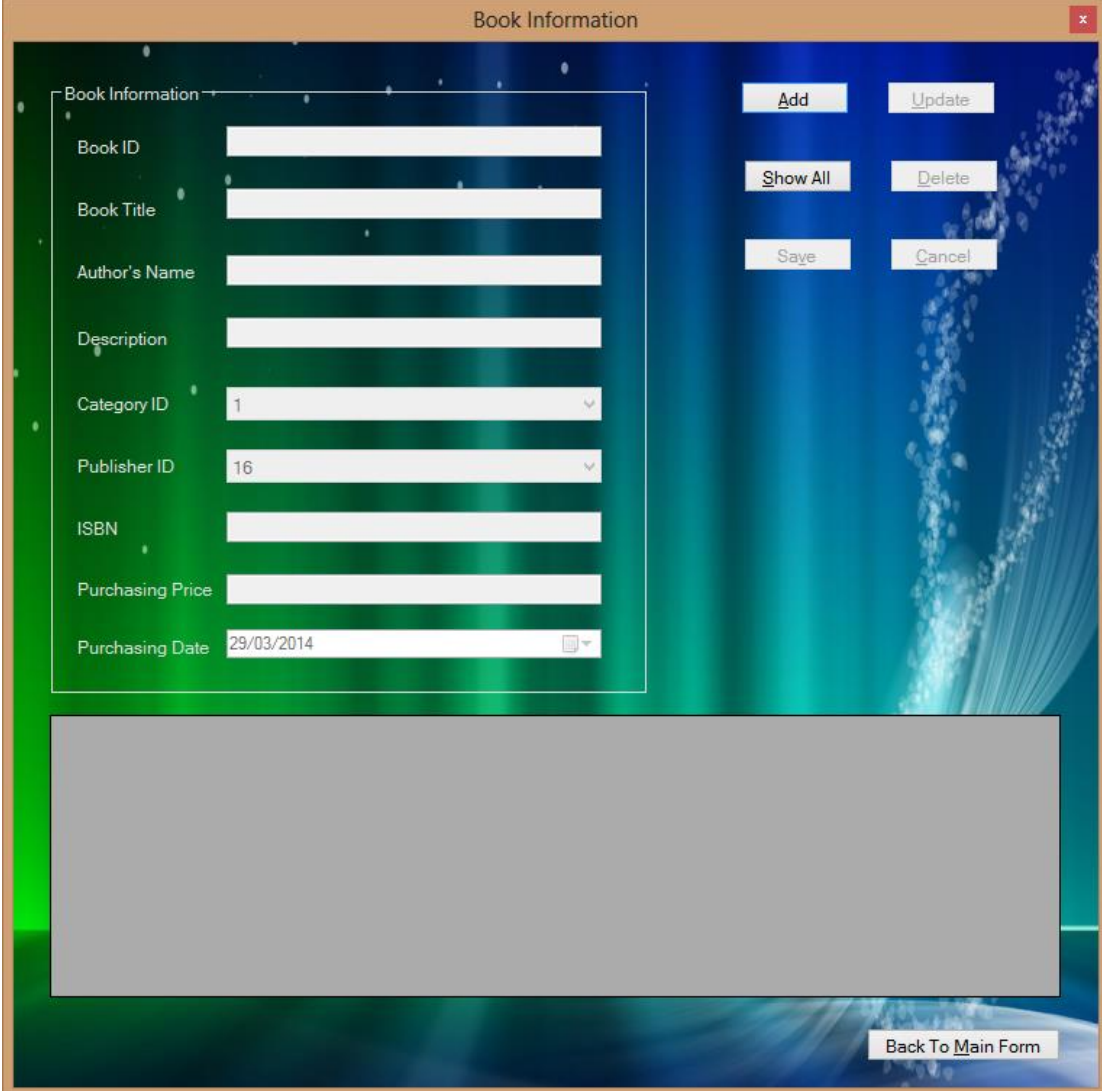
**'Save'** button allows user to save the current record to the database

**'Cancel'** button allows user to cancel the current action and clear the text boxes

**'Back To Main'** button allows user to go back to the main page



If user chooses 'Book Information' form, the book form will come up as shown below.



**'Add'** button allows user to add a new record to the database

**'Update'** button shows selected record in text boxes and let user to correct the data

**'Show All'** button allows user to view all records in data grid

**'Delete'** button allows user to delete the selected record

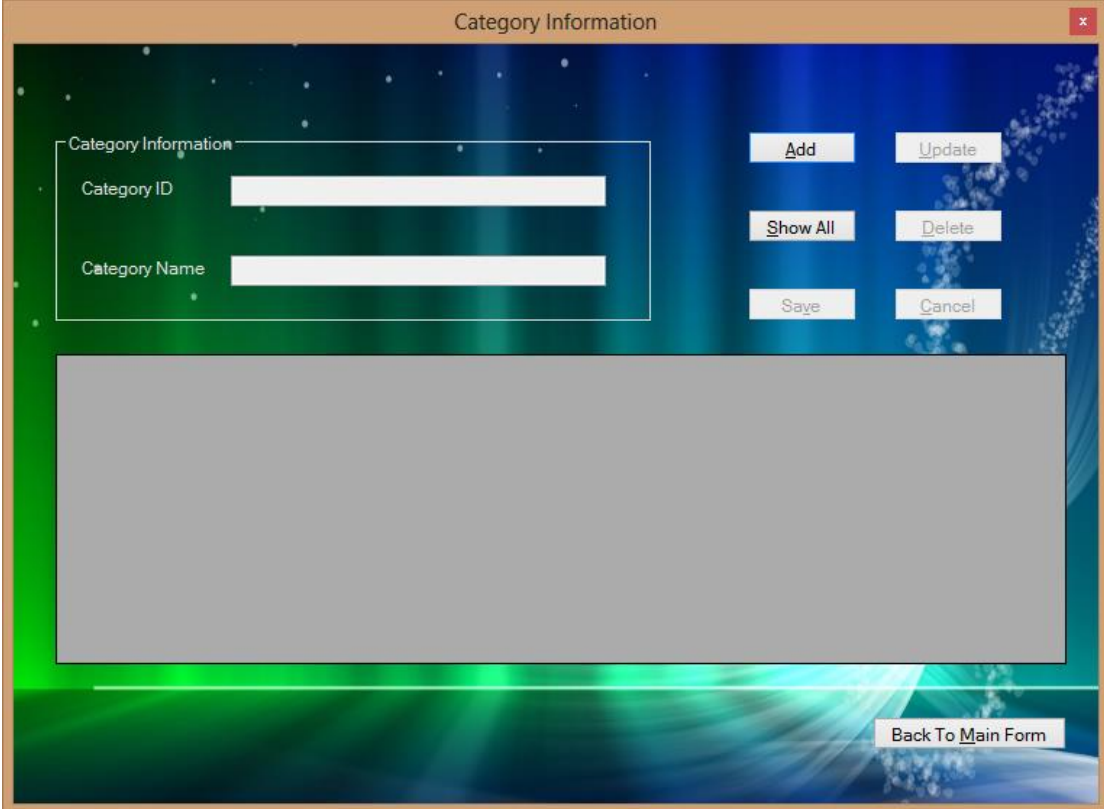
**'Save'** button allows user to save the current record to the database

**'Cancel'** button allows user to cancel the current action and clear the text boxes

**'Back To Main'** button allows user to go back to the main page



If user chooses 'Category Information' form, the category form will come up as shown below.



**'Add'** button allows user to add a new record to the database

**'Update'** button shows selected record in text boxes and let user to correct the data

**'Show All'** button allows user to view all records in data grid

**'Delete'** button allows user to delete the selected record

**'Save'** button allows user to save the current record to the database

**'Cancel'** button allows user to cancel the current action and clear the text boxes

**'Back To Main'** button allows user to go back to the main page

If user chooses 'Publisher Information' form, the publisher form will come up as shown below.

**'Add'** button allows user to add a new record to the database

**'Update'** button shows selected record in text boxes and let user to correct the data

**'Show All'** button allows user to view all records in data grid

**'Delete'** button allows user to delete the selected record

**'Save'** button allows user to save the current record to the database

**'Cancel'** button allows user to cancel the current action and clear the text boxes

**'Back To Main'** button allows user to go back to the main page

If user chooses 'Rental Information' form, the rental form will come up as shown below.

The screenshot shows a Windows application window titled "Rental Information". Inside the window, there is a form with a group box labeled "Rental Information". This group box contains several input fields: "Transaction ID" (a text box), "Member ID" (a dropdown menu showing "1"), "Book ID" (a dropdown menu showing "1"), "Borrow Date" (a date picker showing "08/03/2014"), "Due Date" (a date picker showing "29/03/2014"), and "Status" (a dropdown menu showing "On Loan"). To the right of the form fields, there are six buttons arranged in two columns: "Add", "Update", "Show All", "Delete", "Save", and "Cancel". At the bottom right of the window, there is a button labeled "Back To Main Form". A large, empty grey rectangular area is positioned below the "Rental Information" group box.

**'Add'** button allows user to add a new record to the database

**'Update'** button shows selected record in text boxes and let user to correct the data

**'Show All'** button allows user to view all records in data grid

**'Delete'** button allows user to delete the selected record

**'Save'** button allows user to save the current record to the database

**'Cancel'** button allows user to cancel the current action and clear the text boxes

**'Back To Main'** button allows user to go back to the main page

## 6. CONCLUSION

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### **6.1 program strenghts**

The simple and easy-to-understand user interface allows user able to manage the program without training.

All the database tables are strongly organized and can provide data consistency efficiently.

It is a program that can use without internet connection so it is more stable and more speedy to run.

Every task of this program can perform just as simple as one click so it is very user-friendly.

The colour used in this program is not extremely bright and can provide smooth vision to users.

### **6.2 program weaknesses**

Log in page is not included for the system.

Need to press 'Show All' button before performing delete or update.

Data validation check is not very strict.

### **6.3 program enhancement**

System log in page can be enhanced for better security.

Renewal service can be enhanced.

Reservation service can be included.

Data validation check can be improved.

## 7. REFERENCES

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