Year 12 : Visual Basic Tutorial.

STUDY THIS

Files.

A **file** is a place for storing data that you do not want to lose when the power of your computer is switched off.

There are two main types of file…

1) **Serial file** – data is appended onto the end of the file.
2) **Random Access file** – data is stored in the file at a place calculated from the data.

In applications where data is needed to be accessed quickly then you need a Random Access file.

In a Random Access File of data, a calculation (hashing algorithm) is performed on the key field, resulting in an address (hash address) where the data is stored in the file.

Sometimes a Random Access File is called a Direct Access File. This is specifically designed to confuse you!

HANDS ON

Text Files

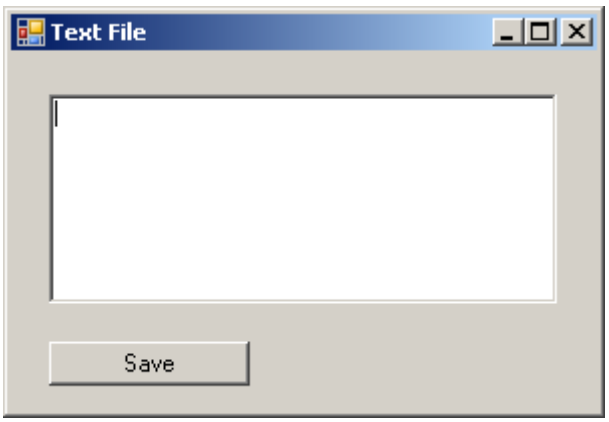
You are going to write a program that allows text to be input and then saved into a file. Later, you will write a program that loads it back.

[1] Create a new Windows application.

On your form place a TextBox (txtData) and a Button (btnSave).

Set the following properties for the txtData…

Property	Value
MultiLine	True



[2] To save the work, you will use a SaveFileDialog control, so drag one from the Toolbox onto your project. It will appear at the bottom of the screen.

Enter the subroutine below into the Click event handler of the btnSave.

```
Private Sub Button1_Click(ByVal sender As System.Object, ByVal e As System.EventArgs)
Handles Button1.Click
   'Set the Dialog box to only display Text files
   SaveFileDialog1.Filter = "Text files (*.txt)|*.txt"

   'Open the Dialog box
   SaveFileDialog1.ShowDialog()

   'Check that a filename has been entered
   If SaveFileDialog1.FileName <> "" Then
   'Write the text to the file
   My.Computer.FileSystem.WriteAllText(SaveFileDialog1.FileName, txtData.Text, False)

   End If
End Sub
```

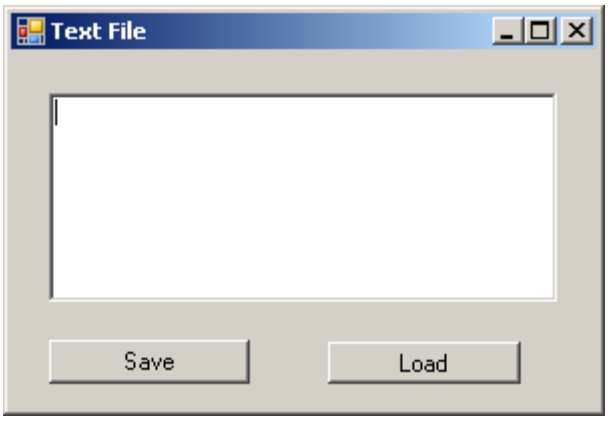
NB : There is a Boolean parameter in the WriteAllText command…This will be True if you want to append the text onto the end of the file…or False, if you want to overwrite any existing text in the file.

[3] Run, the program, enter some text into the TextBox and click on the Save button. Enter a filename in the SaveFileDialog, and click on OK.

Your text should now be saved in a text file. (Check it by opening with Notepad.)

[4] Now let's try to get it back!

Stop the program running and add a new Button (btnLoad) to your form.



You will also need to drag an OpenFileDialog control into your project.

This should appear at the bottom of your screen with the name OpenFileDialog1.

[5] On the Click event handler of btnLoad…

```
Private Sub btnLoad_Click(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles btnLoad.Click

    'Set the Dialog filter to display only text files
    OpenFileDialog1.Filter = "Text files (*.txt)|*.txt"

    'Open the Dialog
    OpenFileDialog1.ShowDialog()

    If OpenFileDialog1.FileName <> "" Then

     'FileOpen(1, OpenFileDialog1.FileName, OpenMode.Input)
    txtData.Text = My.Computer.FileSystem.ReadAllText(OpenFileDialog1.FileName)

    End If

End Sub
```

Run the program and see if you can load the text back.

HANDS ON

Visual Basic Challenges 9

[1] The latest school trip is going to Paris to see the Eiffel Tower and to practice their French.

Write an application that allows pupils to enter their names, one at a time.

The whole list of names should be printed at the end.

[2] Write an application that allows the user to enter a paragraph of text and store it in a file.

The text file can then be loaded in a coded version where all the vowels are removed from the text.

Test data : If the Text "Sing a song of sixpence is entered", then when it is loaded back, the text "Sng sng f sxpnc" is displayed.

STUDY THIS

Random Access Files

To illustrate Random Access Files, you are going to create a file of records for the members of a school drama society.

Each record will have 4 fields in :

Fieldname	Data type
ID	Integer (Key field)
Name	String
Form	String
Actor	Boolean

The records will be stored in a random access file. The ID numbers will start at 1000, and the hashing algorithm will find the address of each record by subtracting 1000. For example, the record with ID 1004 will be stored as record number 4.

HANDS ON

[1] Create a new Windows application.

Records are called Structures in Visual Basic, and the first thing you need to do is define the record structure. Do this in a Module.

```
Structure MemberRecord

        Dim ID As Integer
        Dim Name As String
        Dim Form As String
        Dim Actor As Boolean

End Structure
```

[2] On your Form, add three TextBoxes (txtID, txtName, txtForm), a CheckBox (chkActor), and a Button (btnSave)…and anything else to make the display look appealing…

[3] Here is one of the member records to be entered :

ID	Name	Form	Actor
1004	Tom Jones	12G	True

The program will look at the ID number (1004) and store this record as record number 4.

When creating a Random Access File, you need to :

- Assign values to the fields of a record
- Open a file for random access
- Calculate the hash address of the record
- Save the record at that hash address
- Close the file

The event handler for the Click event of btnSave is here :

```
Private Sub btnSave_Click(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles btnSave.Click
   'Declare a record
   Dim Member As MemberRecord

   'Allocate values to fields in the record
   Member.ID = txtID.Text
   Member.Name = txtName.Text
   Member.Form = txtForm.Text
   Member.Actor = chkActor.Checked

   'Allocate a file number - (let the computer do it!)
   Dim FileNum As Integer
   FileNum = FreeFile()

   'Open the file for Random Access - Change the file path if needed
   FileOpen(FileNum, "H:\My Documents\DramaFile.dat", OpenMode.Random)

   'Calculate the hash address of the record
   Dim RecNum As Integer
   RecNum = Member.ID - 1000

   'Write the record to the file
   FilePut(FileNum, Member, RecNum)

   'Close the file
   FileClose(FileNum)

   'Clear the TextBoxes
   txtID.Text = ""
   txtName.Text = ""
   txtForm.Text = ""
   chkActor.Checked = False

End Sub
```

Run the program and enter the record shown.

(If you open the file Dramafile.dat in Windows Notepad, you should see the data – only the text will be recognisable amongst other garbage!)

[3] Use your program to add these records to your file :

ID	Name	Form	Actor
1002	Alice Springs	11C	True
1004	Tom Jones	12G	True
1005	Jack Flash	12B	False
1007	Rhian Lord	11B	True
1008	Elvis May	12G	False

[4] Now you will try to retrieve the data…You are going to add a new form to your application and search for a particular record.

Add a new Windows Form to your application and name it frmSearch.

On this form, place 3 TextBoxes (txtID, txtName, txtForm), a Button (btnSearch) , a CheckBox (chkActor) and 4 Labels…

Save this form and add a Button (btnSearchForm) to the original form, and add the event handler.

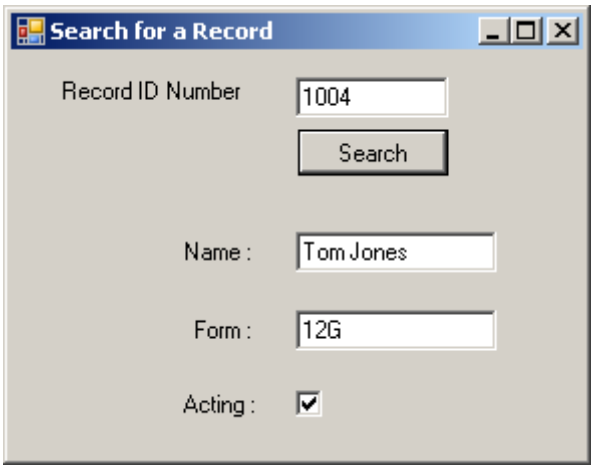
```
Private Sub btnSearchForm_Click(ByVal sender As
System.Object, ByVal e As System.EventArgs) Handles
btnSearchForm.Click
        frmSearch.Show()
End Sub
```

It would be a good idea to run the program and check that you can open the Search Form. It does nothing yet - but you are going to be able to enter an ID number, click the Search button and find and display the appropriate record.

On frmSearch, add this event handler to the Click event of btnSearch…

```
Private Sub btnSearch_Click(ByVal sender As System.Object, ByVal e As
System.EventArgs) Handles btnSearch.Click

  'Declare a record
  Dim Member As MemberRecord

  'Allocate a file number - (let the computer do it!)
  Dim FileNum As Integer
  FileNum = FreeFile()

  'Open the file for Random Access - Change the file path if needed
  FileOpen(FileNum, "H:\My Documents\DramaFile.dat", OpenMode.Random)

  'Calculate the hash address of the record to be read
  Dim RecNum As Integer
  RecNum = txtID.Text - 1000

  'Read the record from the file
  FileGet(FileNum, Member, RecNum)

  'Display the fields in the TextBoxes
  txtID.Text = Member.ID
  txtName.Text = Member.Name
  txtForm.Text = Member.Form
  chkActor.Checked = Member.Actor

  'Close the file
  FileClose(FileNum)

End Sub
```

[5] Run the program and enter an ID number…Click the search button and you should see the fields of the record displayed.



Save the application – you will need it in the Challenge exercises….

Visual Basic Challenges 9

[3] Add a new form to the Drama Club application, that displays the names of all the members in a ListBox.

HINT : Use a loop to read each record. You can test when you get to the end of a file by using …and be careful you don't try to display the blank records.

```
While Not EOF(FileNum)
      …
      …
End While
```

[4] For the brave!!…

RESEARCH NEEDED

One of the most useful objects in Visual Basic is the DataGridView.

See if you can display the Drama Club members on a DataGridView…