CSE 1530

Introduction to Computer Use II: Programming

Winter 2006 (Section M)

Topic F: External Files and Databases – Using Classes and Objects

Monday, March 20 2006

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Overview (1):

- **Before We Begin**
  - Some administrative details
  - Some questions to consider
- **As An Aside**
  - Pull Down Lists (ComboBoxes)
  - Message Boxes
- **Topic Overview**
  - Overview/Introduction
  - As An Aside

Overview (2):

- **Opening and Reading a File**
  - Standard Dialog Window
  - Using the Standard Dialog Window

Before We Begin

Administrative Details (1):

- **No Lab Exercise to Submit This Week**
  - Nothing to submit today (Monday, March 20)
- **Correction For This Week's Exercise**
  - Submit Exercise 6-8 and not Exercise 6-9
  - Due March 27 2006
- **Test 2 And Various Exercises That Haven't Been Picked Up**
  - Available at the end of the lecture

Administrative Details (2):

- **Test Annulment Forms**
  - Will be available from March 27 – April 21 2006 from the Computer Science Engineering Undergrad Office located in CSEB 1003
    - Office hours → 10:00am – 12:00pm & 2:00-4:30pm
  - Must be completed if you wish to drop either of your test grades (Test 1 and/or Test 2)

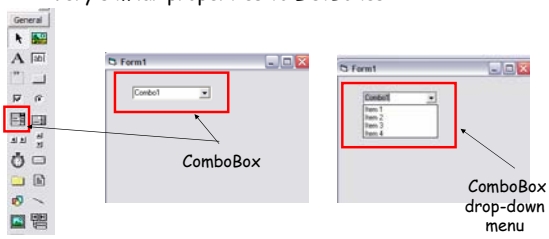
Some Questions to Consider (1):

- What is the purpose of data validation ?
- How does Visual Basic allow us to validate data ?
- What is the CausesValidation property ?
- What is the Validate event handler ?
- What is the purpose of "white-space" use ?

As An Aside…

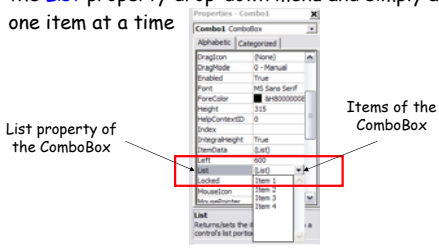
ComboBox (1):

- **What is a "Drop-Down" ComboBox ?**
  - Allows you to have a list of items from which the user can make a selection
  - Very similar properties to ListBoxes



ComboBox (2):

- **Using a ComboBox (Adding Items)**
  - Two ways to adding items
    - Design mode → in the properties window, choose the List property drop-down menu and simply add one item at a time



ComboBox (3):

- **Using a ComboBox (Adding Items) (cont.)**
  - Two ways to adding items (cont.)
    - Run mode → using the AddItem procedure of the ComboBox (similar to the ListBox object)
    - Assume we have a ComboBox called myComboBox, the following will add three items to the ComboBox

```
myComboBox.AddItem("Item 1")
myComboBox.AddItem("Item 2")
myComboBox.AddItem("Item 3")
```

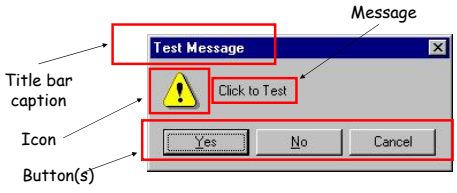
    - Can use the Clear method to "clear" the ComboBox

Message Box (1):

- **What is a Message Box ?**
  - A special type of Visual Basic window ("Dialog Box") that is used to display a message to the user
  - Can be used to convey a message but can also be called as a function that will return a value back to the caller indicating the user's response
  - In addition to the message, you can also include the following in the message box
    - Icon
    - Title bar caption
    - Command button

Message Box (2):

- **What is a Message Box (cont.)**
  - Can be used in many situations
    - When user has entered invalid data
    - When user has neglected to enter required data
    - To convey some form of information to the user



Message Box (3):

- **Creating a Message Box**
  - The MsgBox Statement General Form

MsgBox "Message String" [, Button/Icon] [, "Caption of title bar"]

  - Message String
    - Message you want to appear in the message box
  - Button/Icon
    - Optional → determines the command buttons that will be displayed in the message box and any icons that will appear

Message Box (4):

- **Creating a Message Box (cont.)**
  - Button/Icon Options

Button/Icon	Value	Constant
Ok Button	0	vbOkOnly
Critical Message Icon	16	vbCritical
Warning Query Icon	32	vbQuestion
Warning Message Icon	48	vbExclamation
Information Message Icon	64	vbInformation

Message Box (5):

- **Creating a Message Box (cont.)**
  - The MsgBox Statement General Form

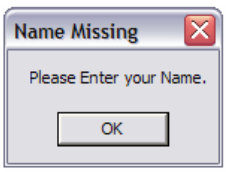
MsgBox "Message String"[, Button/Icon] [, "Caption of title bar"]

  - Caption of title bar
    - Optional → caption displayed in the message box title bar
    - If this is omitted, then the default caption will be the project name → this is considered sloppy programming practice!!

Message Box (6):

- **Example of Using a Message Box**

```
If (txtName.text = vbNullString) Then
    MsgBox "Please Enter Your Name.", vbOkOnly, "Name Missing"
End If
```



Topic F Overview

Overview (1):

- **So Far…**
  - Up until this point, all required user input has been given directly by the user, typically via TextBoxes
  - Next step is to write programs that access a file not already connected to the program
    - Provides much greater flexibility
    - Can make user input/output much more quicker thus increasing computation speed → displaying anything to the screen is VERY computationally expensive!

Overview (2):

- **What is a File ?**
  - Collection of stored data that is referred to by a specific name
  - Data can be read and modified
    - We can add new data to the file or change the existing data on the file
  - "Permanent" storage of data
    - Permanent when considering RAM that is only active while the computer is ON

Overview (3):

- **"Road Map"**
  - The focus of this chapter is file processing
    - We will examine how to input data to a program by reading the data from a file
    - We will examine how to access files through the local computer system → this will involve not only reading data from a file but also writing data to a file (e.g., output)
  - We will use standard Microsoft Windows dialog boxes for browsing the file system
    - The same for any Windows application → should be familiar to you!

Overview (4):

- **Working With Files Summary**
  - Using the standard Microsoft file dialog we will obtain the name of the file
  - The file will be opened using "new" Visual Basic classes called FileSystemObject and TextStream that provide the necessary tools for opening, reading and writing files
  - Working with additional classes, we will be able to work with the file
    - We will focus files that have been constructed to contain fields and records (a simple database)

Overview (5):

- **Working With Files Summary (cont.)**
  - We will see how to perform common operations
    - Deleting and adding records
    - Searching for a record
    - Scroll through the records

Overview (2):

- **Chapter Challenges**
  - Working with files will allow us to understand new Object Oriented Programming concepts
    - Using new classes → before we can use the new class, we should understand the properties and methods of the class

Overview (2):

- **Main Concepts of This Chapter**
  - Understanding and using new classes effectively
  - Understanding the difference between Private and Public properties and subprograms
  - Using the Common Dialog control
  - Multiple Forms in a program
  - Using the FileSystemObject and TextStream classes
  - Creating and using a data source class
  - Using the RecordSet class and BindingCollection class

As An Aside (1):

- **Other Approaches to File I/O**
  - Although we will focus on an Objected Oriented approach to reading/writing to and from a file, this is not the only approach
    - We are of course using this approach to emphasize Object Oriented Programming
    - We want to obtain experience with creating/using classes/objects
  - With Visual Basic, we can work with files in a non-OOP method
    - Using the VB Open statement

As An Aside (1):

- **Other Approaches to File I/O (cont.)**
  - The Open statement is used in conjunction with the Input (for reading) and Write (for output) statements
    - Together with the EOF (End of File) function if the file was opened in Input, Output or Append mode or
    - In conjunction with the Get and Put statements and the LOF function if the file was opened in Random mode

Opening and Reading a File

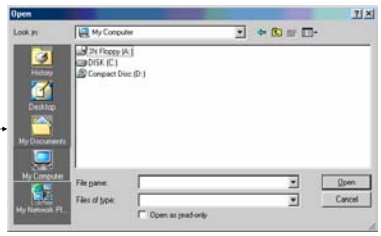
Opening a File (1):

- **Standard Dialog Window**
  - Most MS Windows applications use a standard dialog window for locating and specifying a file to be opened
    - Allows the user to easily navigate through the file (directory) system to locate and open a file
    - Being a standard interface across all (most) MS applications ensures user familiarity → opening a file in Word is the same as opening a file in PowerPoint
    - Part of what is known as the Microsoft Common Dialog Controls

Opening a File (2):

- **Standard Dialog Window (cont.)**
  - Since we're developing Windows applications with VB, we will of course employ this standard file dialog
    - Easy to incorporate in our VB applications

Standard Windows file dialog window →

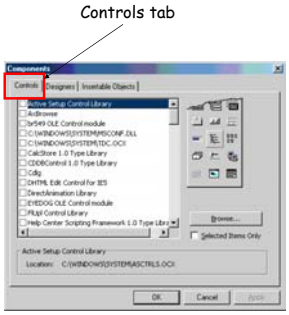


Opening a File (3):

- **Common Dialog Control**
  - Although easy to use, the Common Dialog Control (and of course all its associated "controls") are not included in the standard VB development environment
    - Whenever we develop any programs that require its use, we must explicitly add it

Opening a File (4):

- **Adding the Common Dialog Control**
  - Begin a new standard VB project
  - Under the Project menu select the Components option
    - This will cause the following window to appear



Opening a File (5):

- **Adding the Common Dialog Control**
  - Ensure the Controls tab is selected
    - This allows you to add any number of the displayed components to your VB project that are needed
    - We are of course only interested in the Microsoft Common Dialog Control 6.0 → select it & click "Ok"
    - Observe the toolbox in your VB workspace → you should observe a new icon representing the control for creating the standard MS dialog windows

Opening a File (6):

- **Adding the Common Dialog Control (cont.)**
  - You can now add the file dialog control to your Form as you would add any other control from the tool box
  - This control is however slightly different from the other controls
    - Cannot be resized
    - When you run the project the control does not appear! → therefore, doesn't matter where on the form it is placed – its purpose is simply to make the CommonDialog object available to your program via the code you write

Opening a File (7):

- **Adding the Common Dialog Control (cont.)**
  - Placing the Common Dialog Object on a Form and executing the program