Graphic User Interface Design

Why GUI?

- enhances program’s look and feel
- make interaction between program and users easy
- allows user to easily learn and use program
- allow user to work more efficiently
GUI building blocks

- GUI built with controls
- Controls - predefined program components
- Two kinds of controls
  - intrinsic (standard) controls
  - ActiveX controls
    - ActiveX - Macrosoft’s object packaging technology
      - component-oriented software construction
      - allow programmers to build their own components
      - can be built using VB, VC++, VJ++
      - runs faster
      - allow sharing of ActiveX components

Intrinsic controls

- Checkbox chk act as toggle
- ComboBox cbo displays a drop-down list
- Data dat navigates data in a database
- DirListBox dir display a directory box
- DriveListBox drv display a drive list box
- FileListBox fil display a file list box
- Frame fra acts as a container for other controls
- Image img display images
- Label lbl display static text
- Line lin draws lines
Intrinsic controls

<table>
<thead>
<tr>
<th>Control</th>
<th>Abbreviation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ListBox</td>
<td>lst</td>
<td>display a list</td>
</tr>
<tr>
<td>OLE</td>
<td>ole</td>
<td>acts as an ole container</td>
</tr>
<tr>
<td>OptionButton</td>
<td>opt</td>
<td>display options (choose one)</td>
</tr>
<tr>
<td>PictureBox</td>
<td>pic</td>
<td>display images, also a container for other controls</td>
</tr>
<tr>
<td>scrollbars</td>
<td>hsb</td>
<td>specify a range of values</td>
</tr>
<tr>
<td></td>
<td>vsb</td>
<td>specify a range of values</td>
</tr>
<tr>
<td>Shape</td>
<td>shp</td>
<td>draws graphical shapes</td>
</tr>
<tr>
<td>TextBox</td>
<td>txt</td>
<td>text input</td>
</tr>
<tr>
<td>Timer</td>
<td>tmr</td>
<td>raises an event after a specified interval</td>
</tr>
</tbody>
</table>

OLE - Object Linking and Embedding

- Allows applications to work together seamlessly (e.g. opening Excel from inside Word)
- provides services
  - drag
  - drop
  - automation - allows one application to control another
Some ActiveX controls (cont.)

<table>
<thead>
<tr>
<th>Control</th>
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</thead>
<tbody>
<tr>
<td>CommonDialog</td>
<td>dlg</td>
<td>provides several common common dialog</td>
</tr>
<tr>
<td>FlatScrollBar</td>
<td>fsb</td>
<td>scrollbar that provides a visual response when mouse is placed over it</td>
</tr>
<tr>
<td>ImageCombo</td>
<td>imgcbo</td>
<td>enhanced ComboBox capable of displaying images and text</td>
</tr>
<tr>
<td>ImageList</td>
<td>ils</td>
<td>stores a series of images</td>
</tr>
<tr>
<td>MaskedEdit</td>
<td>msk</td>
<td>enhanced TextBox that can control the format of user input</td>
</tr>
<tr>
<td>RichTextBox</td>
<td>rtf</td>
<td>enhanced TextBox providing basic editing capabilities</td>
</tr>
<tr>
<td>Slider</td>
<td>sld</td>
<td>represents a range of values</td>
</tr>
<tr>
<td>UpDown</td>
<td>upd</td>
<td>allows scrolling through a set of values</td>
</tr>
</tbody>
</table>

Database ActiveX controls

<table>
<thead>
<tr>
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<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADO Data control</td>
<td>ado</td>
<td>support connection to databases</td>
</tr>
<tr>
<td>DataCombo</td>
<td>dbc</td>
<td>enhanced ComboBox automatically populated with data from a database</td>
</tr>
<tr>
<td>DataGrid</td>
<td>dgd</td>
<td>a table automatically populated with data from a database</td>
</tr>
<tr>
<td>DataList</td>
<td>dbl</td>
<td>enhanced ListBox automatically populated with data from a database</td>
</tr>
<tr>
<td>Hierarchical FlexGrid</td>
<td>flex</td>
<td>a read-only table automatically populated with data from a database</td>
</tr>
</tbody>
</table>
MaskEdit control

- ActiveX control
- special version of TextBox
- provides restricted data input as well as formatted data output

Adding MaskedEdit control
ComboBox control

- Combines TextBox with a short dropdown list
ComboBox control

- Three styles
  - vbComboDropDown
    user can type input or select from list
  - vbComboSimple
    has the appear of TextBox. User can type input.
  - vbComboDropDownList
    user cannot type input. Can only choose from list.

ListBox

- Properties
  - Styles
    - Standard 0
    - Checkbox 1
  - multiSelect
    - None 0
    - Simple 1
    - Extended 2

- Methods
  - AddItem
  - Clear
  - RemoveItem
  - SetFocus

- Event procedures
  - Click
  - DblClick
  - GotFocus
  - LostFocus
Scrollbars

Slider control
Example of slider bar application

Progress bar

- graphically represent the progress of a transaction

- possible uses
  - To inform the user of progress as a file transfer occurs over a network.
  - To reflect the state of a process that takes more than a few seconds.
  - To inform the user of progress as a complex algorithm is being calculated.
Progress bar

Private Sub Form_load()
    ' Show the ProgressBar control.
    prgJob.Visible = True
    prgJob.Max = 100
End Sub

Private Sub job()
    Do Until <end condition>
        ' Update the ProgressBar control.
        prgJob.Value = <percent position>
        ' perform processing
    Loop
    ' Hide the ProgressBar control.
    prgJob.Visible = False
End Sub

Menus
Menu controls

Sub mnuMessage_Click()
    MsgBox ("Hello")
End Sub

Pop-up menus

- Create use Menu Editor
- Must have a top level menu that is invisible
- Must have at least one submenu that is visible
- Use **Call PopupMenu** method to display