

- * Review Lab 2
- * Review ListBoxes
- * Namespaces and Assemblies
- * Intro to ArcObjects (IGxDialog, IMxDocument, ILayer2)
- * Garbage collection

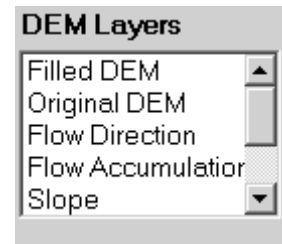
GEOG 4/590: GIS Programming

Lab 2

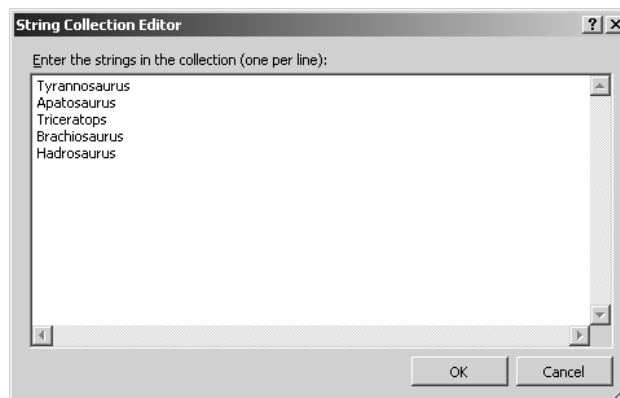
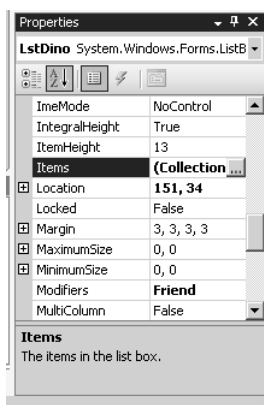
- Can you copy and paste form controls?
- What is an infinite loop?
- How do you set the title of dockableWindow (form)?
- How can you get a better approximation of Pi?

ListBox

- Used to give users a list of choices
- ListBox vs. ComboBox?
- SelectionMode
 - One
 - None
 - MultiSimple
 - MultiExtended (SHIFT, CTRL, and arrow keys)



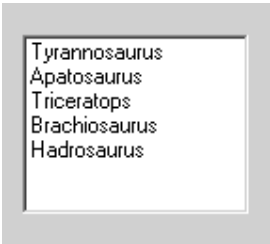
Add items (design view)



Add items from a List

```
Dim dinolist As List(Of String) = New List(Of String)
dinolist.Add("Tyrannosaurus")
dinolist.Add("Apatosaurus")
dinolist.Add("Triceratops")
dinolist.Add("Brachiosaurus")
dinolist.Add("Hadrosaurus")

For Each dinosaur As String In dinolist
    LstDino.Items.Add(dinosaur)
Next
```




Tyrannosaurus
Apatosaurus
Triceratops
Brachiosaurus
Hadrosaurus

Add items from an Enumeration

```
Public Class FrmWeek5





    Public Enum flavorEnum
        salty
        sweet
        sour
        bitter
    End Enum

    Private Sub LoadListBox()
        Dim i As String
        For Each i In [Enum].GetNames(GetType(flavorEnum))
            ' Calling toString() method for each item in enum
            ListBox1.Items.Add(i)
        Next
    End Sub
End Class
```



salty
sweet
sour
bitter

Selecting items

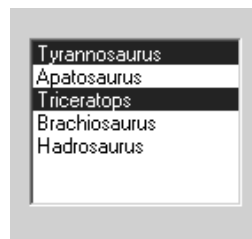
	SelectedIndex	Overridden. Gets or sets the zero-based index of the currently selected item in a ListBox .
	SelectedIndices	Gets a collection that contains the zero-based indexes of all currently selected items in the ListBox .
	SelectedItem	Gets or sets the currently selected item in the ListBox .
	SelectedItems	Gets a collection containing the currently selected items in the ListBox .

- Get or set SelectedIndex, SelectedItem
- index (Integer) vs. Object
 - `LstDino.SelectedIndex = 2`
 - `Dim idx as Integer = LstDino.SelectedIndex`

Select multiple items

- Multi-select list methods return a Collection
- SelectedIndices, SelectedItems are “getters” only
- Modify the Collection to modify the list
- `ListBox.SelectedIndexChanged` event works with either

```
LstDino.SelectedIndices.Add(0)
LstDino.SelectedItems.Add("Triceratops")
```



Removing items from a listBox

` Remove by object

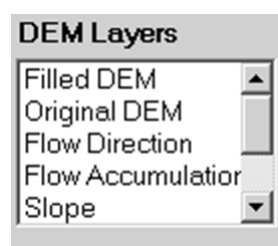
```
ListBox1.Items.Remove("Slope")
```

` Remove by index

```
ListBox1.Items.Remove(3)
```

` Remove all

```
ListBox1.Items.Clear()
```



Namespace

- Groups similar classes together
- May be hierarchical in nature: namespaces can contain other namespaces
- Read from left to right:
 - System.Windows.Forms
 - ESRI.ArcGIS.Display
- A class belongs to only one namespace
- Your projects have a root namespace

Shorthand

- .NET “automagically” creates shorthand version of classes in System assembly
 - System.Diagnostics.Debug.Print() = Debug.Print()
 - System.String = String

Imports statement

- Imports statement at beginning of class/module allows you to use shorthand

```
Imports System.Windows.Forms  
MessageBox.Show("Exception: " & ex.Message)
```

- Instead of

```
System.Windows.Forms.MessageBox.Show _  
("Exception: " & ex.Message)
```

However...

- Possible to have multiple classes with the same shorthand name
- VB .NET editor will complain if the shorthand name is ambiguous

ArcObjects .NET API

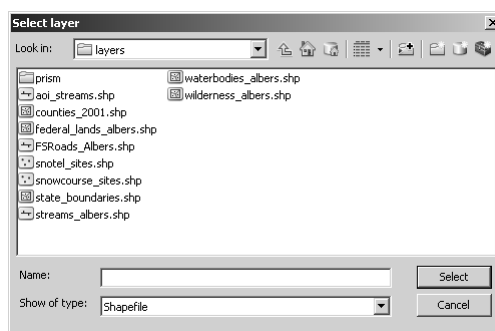
- .NET assemblies are identified by their namespace: ESRI.ArcGIS.Carto
- All available ArcObjects classes are accessible from .NET assemblies
- .NET projects must add ESRI assemblies as references: ESRI.ArcGIS.Carto.dll

Finding an assembly demo

- Use ArcObjects Help for .NET from ArcGIS Developer Help menu (Index tab)
 - IMap
 - IColorRamp
 - IFields
 - IGXDialog
 - IGXObjectFilter

IGxDialog

- ArcObjects version of OpenFileDialog/SaveFileDialog



Creating the IGxDialog

```
'initialize and open mini browser
Dim pGxDialog As IGxDialog = New GxDialog
Dim pFilter As IGxObjectFilter = New GxFilterShapefiles
Dim bObjectSelected As Boolean
With pGxDialog
    .AllowMultiSelect = False
    .ButtonCaption = "Select"
    .Title = "Select layer"
    .ObjectFilter = pFilter
    bObjectSelected = .DoModalOpen(My.ArcMap.Application.hWnd, pGxObjects)
End With
```

IGxObjectFilter

CoClasses that implement IGxObjectFilter

CoClasses and Classes	Description
GpsLogFilter (esriArcMapUI)	The GPS Log Filter.
GxFilterAddressLocators (esriLocationUI)	A filter that controls which address locators are displayed.
GxFilterAnnotationFeatureClasses	A filter for displaying/choosing annotation feature classes.
GxFilterBasicTypes	A filter for displaying basic types, like the catalog, disk connections, folders, etc. Typically, other filters use this object internally.
GxFilterCadAnnotationClasses	A filter for displaying/choosing Cad Annotation Classes.
GxFilterCadastralFabrics	A filter for displaying/choosing Cadastral Fabric datasets.
GxFilterCadDrawingDatasets	A filter for displaying/choosing Cad Drawing datasets.
GxFilterCadFeatureClasses	A filter for displaying/choosing Cad Feature Classes.
GxFilterContainers	A filter for displaying/choosing containers (folders and databases).
GxFilterCoverageAnnotationClasses	A filter for displaying/choosing coverage annotation classes.
GxFilterCoverageFeatureClasses	A filter for displaying/choosing coverage feature classes.
GxFilterCoverages	A filter for displaying/choosing coverages.
GxFilterDataElements	A filter for displaying/choosing data elements.

IMxDocument

- The ArcMap running application
- Role of **MxDocument** is to control the representation of data
- Implements several interfaces including **IMxApplication** and **IDocument**.
- **IMxDocument** is a starting point for accessing many ArcMap objects (collection of maps, the page layout, and the style gallery)

IMxDocument (cont.)

- Only one MxDocument per session of ArcMap
- Accessed from AddIn component with `My.ArcMap.Document`

MxDocument code walkthrough

ILayer

- Generic interface for all layer objects
- Used by both IGxDialog and IMxDocument to work with layers
- Represents a layer on a map
- Implemented by FeatureLayer and RasterLayer

Garbage collection

- System.GC keeps track of references to an object
- Looks for object with no open references; No-one knows about them
- Objects may be deleted from memory
- Runs periodically based on inner algorithm
- Can run on demand

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GC snippet

```
'Dim ArcObjects objects outside of Try/Catch
Dim pMxDocument As IMxDocument
Dim pMaps As IMaps
Dim pMap As IMap

Try
  ' Access to current Document from addIn
  pMxDocument = My.ArcMap.Document
  ' Maps collection from current Document
  pMaps = pMxDocument.Maps

  Finally
    ' Release ArcObjects resources
    pMap = Nothing
    pMaps = Nothing
    pMxDocument = Nothing
    ' Call garbage collection
    GC.Collect()
    GC.WaitForPendingFinalizers()
End Try
```

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