* Using ArcObjects: Color, Style Gallery, and Layer Symbology

GEOG 4/590: GIS Programming

1

Class Interface

```
Public Interface IDemo
    Sub doSomething()
End Interface

Public Class implementIDemo

    Private Sub doSomething() Implements IDemo.doSomething
        MsgBox("Something via object interface")
    End Sub

    Public Sub doSomething2()
        MsgBox("Something via object instance")
    End Sub
End Class
```

```
Dim varInterface As IDemo = New implementIDemo
Dim varClass As New implementIDemo
varInterface.doSomething()
varClass.doSomething2()
```

2

ArcObjects Type Casting (aka Query Interface)

- Example – get the file path of a layer

  Interfaces:
  - Ilayer 'Web Link
  - Idataset 'Web Link

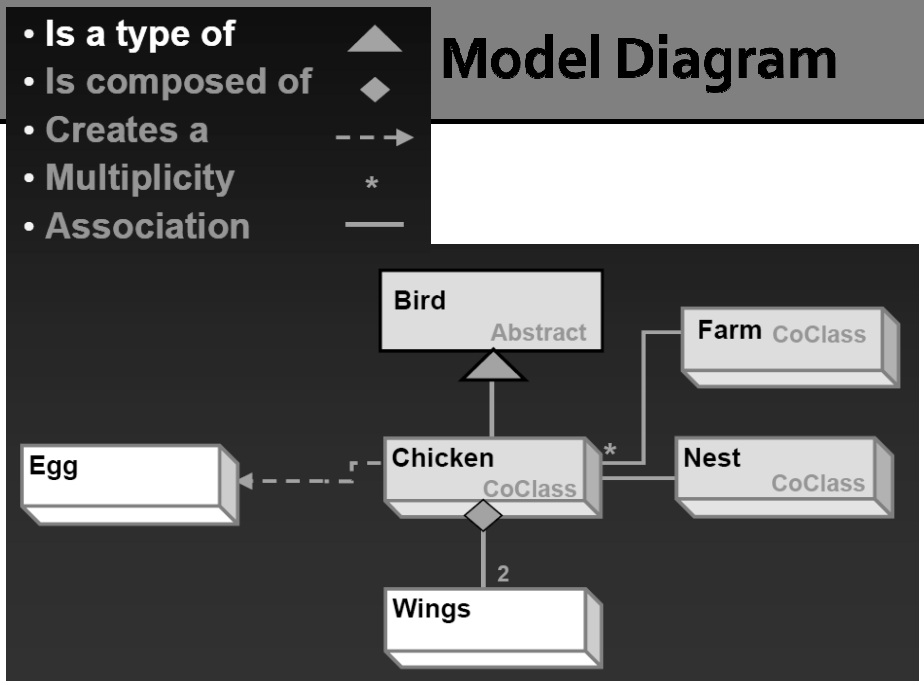
```
Dim pLayer As ILayer
Dim pDSet As IDataset

pLayer = My.ArcMap.Document.FocusMap.Layer(0)
pDSet = TryCast(pLayer, IDataset) 'aka QI

MsgBox(pLayer.Name)
MsgBox(pDSet.Workspace.PathName)
```

3

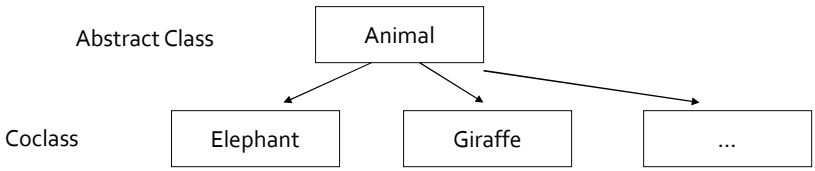
Model Diagram

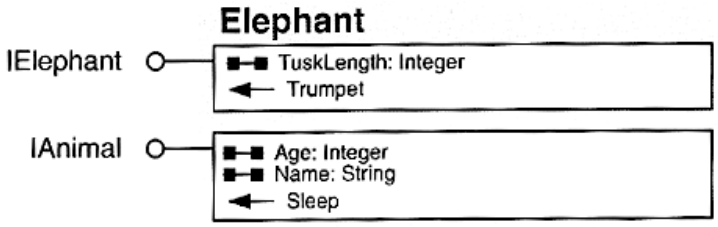


Types of Classes

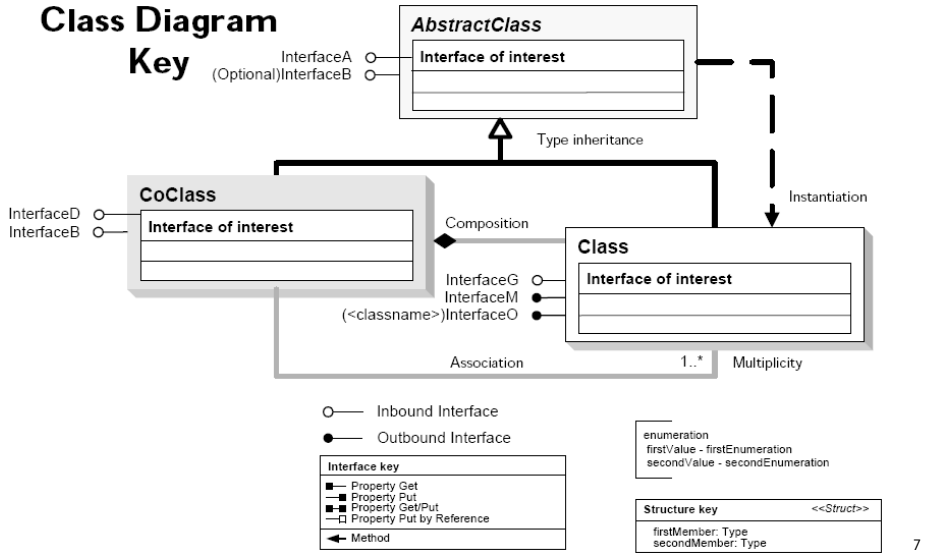
- A **CoClass** (concrete class) can directly create COM objects by declaring a new object (e.g., FeatureClass).
- An **abstract class** cannot be used to create new objects but is a specification for instances of subclasses (through type inheritance) (e.g., GeoDataset)
- A **Class** cannot directly create objects, but objects of this class can be created as a property of another class or instantiated by objects from another class (e.g., EnumInvalidObject in data conversion)

Class & Interface





ArcObjects Model Diagram Key



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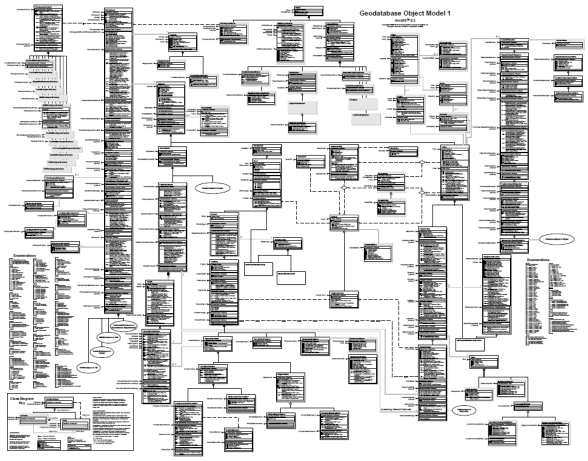
ArcObjects Object Diagrams

- I:\Students\Instructors\Geoffrey_Duh\GEOG4590\9.3\Diagrams
- ArcObjects Namespaces
  (http://help.arcgis.com/en/sdk/10.0/arcobjects_net/componenthelp/index.html#//0008000000020000000)



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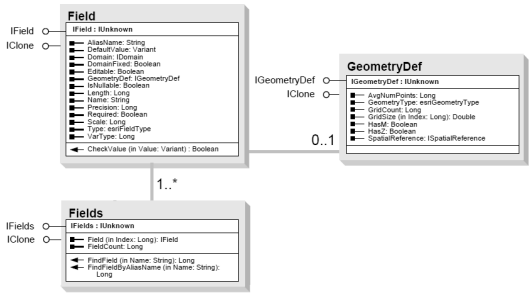
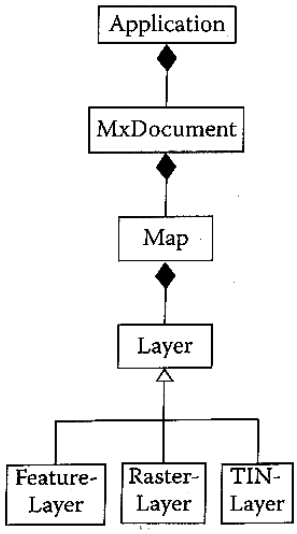
Types of Relationships - Association

- **Associations** represent relationships between classes. They have defined multiplicities at both ends (i.e., how many instances of one class can be associated with the other class.)
  - **1** - One and only one (if none shown, '1' is implied)
  - **0..1** - Zero or one
  - **M..N** - From M to N (positive integers)
  - ***** or **0..*** - From zero to any positive integer
  - **1..*** - From one to any positive integer



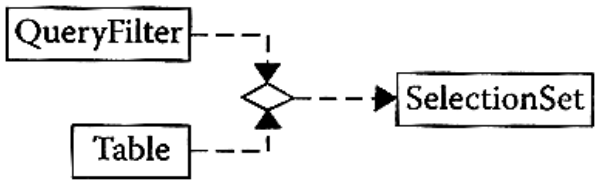
Types of Relationships – Composition & Type Inheritance

- **Composition** is a relationship in which objects from the 'whole' class control the lifetime of objects from the 'part' class (i.e., Map and FeatureLayer classes).
- **Type inheritance** defines specialized (sub)classes of objects which share properties and methods with the superclass and have additional properties and methods.



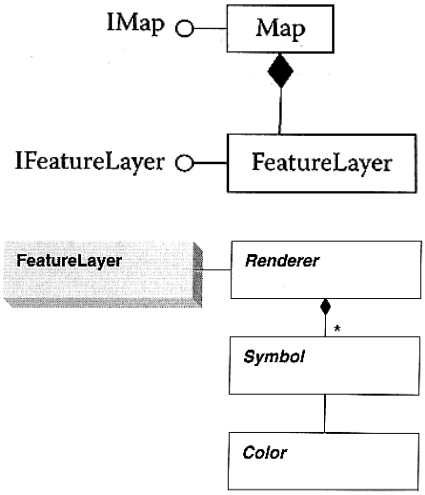
Types of Relationships (3)

- **Instantiation** specifies that one object from one class has a method with which it creates an object from another class.
- An **N-ary association (Aggregation)** specifies that more than two classes are associated. A diamond is placed at the intersection of the association branches.



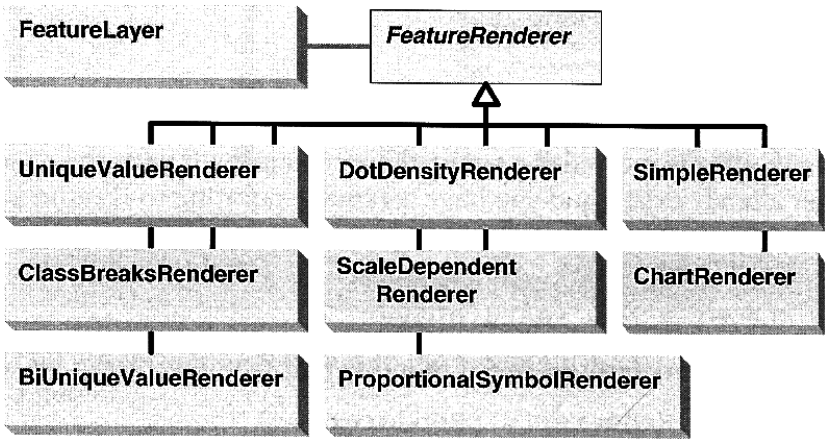
How to change the color of a layer? Layer Symbology - Basic Classes

Abstract Classes
- Renderer
- Symbol
- Color

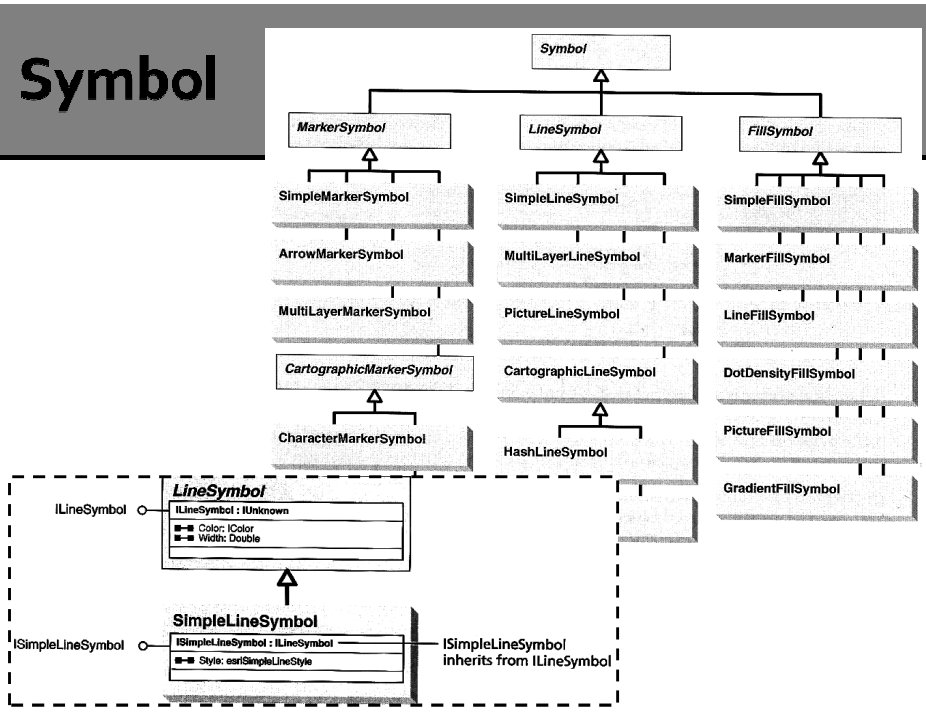



```
pLayer = My.ArcMap.Document.FocusMap.Layer(0)
```

FeatureRenderer



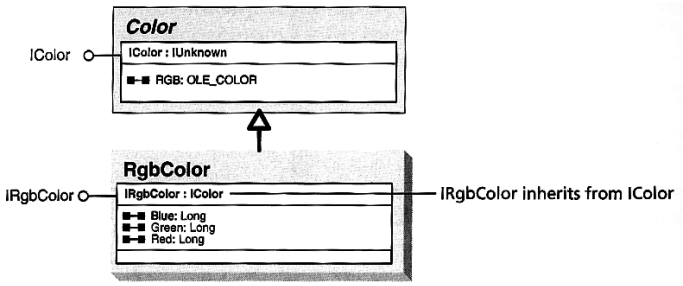
Symbol



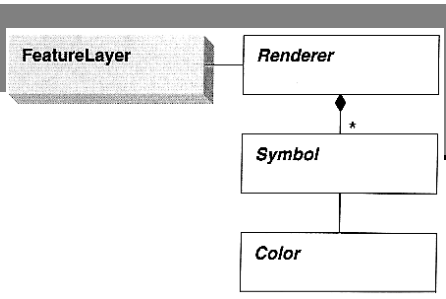
Color & RgbColor

Dim pColor As New RgbColor

'interface inheritance, IRgbColor inherits IColor
pColor.RGB = RGB(255, 127, 0) 'RGB is a VB function
pColor.Red = 255
pColor.Green = 127
pColor.Blue = 0



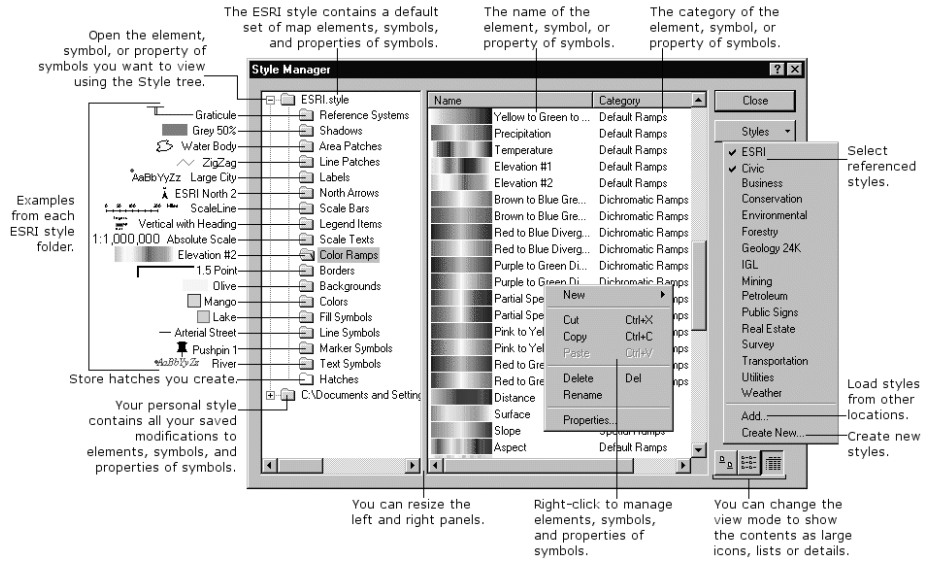
Change Layer Color




```
'create and set color
Dim pColor As New RgbColor
pColor.RGB = RGB(255, 0, 0)

'create and set symbol
Dim pSymbol As ILineSymbol
pSymbol = New SimpleLineSymbol
pSymbol.Color = pColor

'create and set renderer
Dim pRenderer As ISimpleRenderer = New SimpleRenderer
pRenderer.Symbol = pSymbol

Dim pMxDoc As IMxDocument
Dim pGFLayer As IGeoFeatureLayer
pMxDoc = My.ArcMap.Document
If TypeOf (pLayer) Is IFeatureLayer Then
    pGFLayer = pLayer 'implicit casting
    pGFLayer.Renderer = pRenderer
    pMxDoc.UpdateContents() 'update TOC
    pMxDoc.ActivatedView.Refresh() 'update view
Else
    MsgBox("Not a feature layer")
End If
'clean up
```

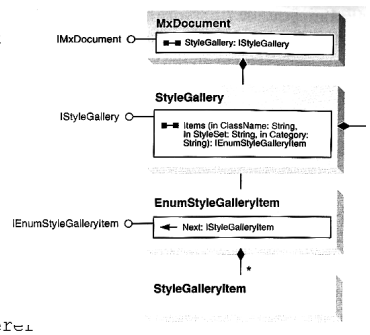
ArcGIS Style Manager

The Style Manager

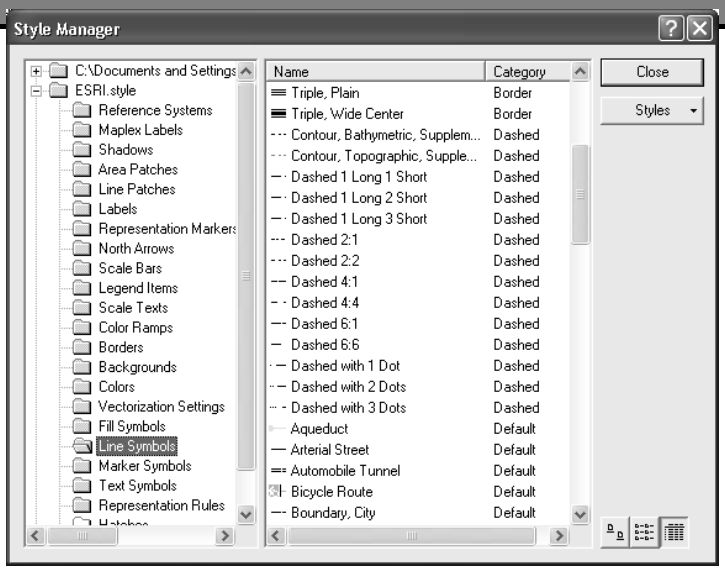


StyleGallery

```
Dim pMxDoc As IMxDocument = My.ArcMap.Document
Dim pLayer As ILayer = pMxDoc.FocusMap.Layer(0)

Dim pStyleG As IStyleGallery = pMxDoc.StyleGallery
Dim pEnumStyleG As IEnumStyleGalleryItem
pEnumStyleG = pStyleG.Items( _
            "Line Symbols", "ESRI.style", "Dashed")
'Items Arguments: Class Name, StyleSet, and Category

pEnumStyleG.Reset()
Dim pLineSym As ILineSymbol
Dim pStyleItem As IStyleGalleryItem = pEnumStyleG.Next

Do Until pStyleItem Is Nothing
    MsgBox(pStyleItem.Name)
    If pStyleItem.Name = "Dashed 4:4" Then
        pLineSym = pStyleItem.Item
        Exit Do
    End If
    pStyleItem = pEnumStyleG.Next
Loop

'create and set renderer
If pLineSym IsNot Nothing Then
    Dim pRenderer As ISimpleRenderer = New SimpleRenderer
    pRenderer.Symbol = pLineSym

    Dim pGFLayer As IGeoFeatureLayer
    pGFLayer = pLayer 'implicit casting
```



pStyleG.Items("Line Symbols", "ESRI.style", "Dashed")



Project Resources

- ArcGIS Resource Center - ArcObjects SDK 10 Microsoft .NET Framework
- ArcObjects .NET API Code Gallery
- ArcScripts (http://arcscripts.esri.com/)
- Browse code to find key interfaces

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