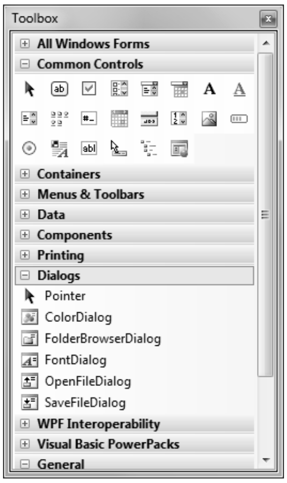
* VB .NET File I/O
* Network shortest path algorithm

GEOG 4/590: GIS Programming

File I/O

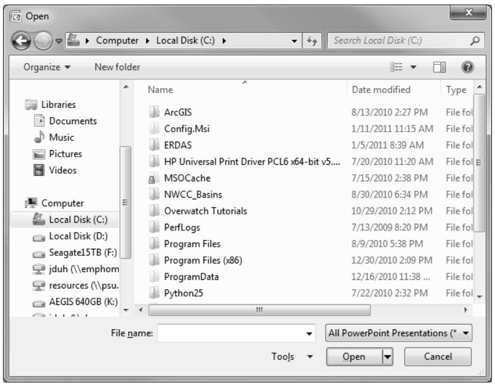
- GUI
  - OpenFileDialog
  - SaveFileDialog
- File management
  - File Class
- File read/write
  - StreamReader / StreamWriter



OpenFileDialog and SaveFileDialog

- Inheritance: System.Object
- Namespace: System.Windows.Forms.FileDialog

- Properties
  - FileName
  - FileNames
  - Filter
  - FilterIndex
  - InitialDirectory
  - SafeFileName
  - Title



Name	Date modified	Type
ArcGIS	8/13/2010 2:27 PM	File fol
Config.Msi	1/11/2011 11:15 AM	File fol
ERDAS	1/5/2011 8:39 AM	File fol
HP Universal Print Driver PCL6 x64-bit v5....	7/20/2010 11:20 AM	File fol
MSOCache	7/15/2010 2:38 PM	File fol
NWCC_Basins	8/30/2010 6:34 PM	File fol
Overwatch Tutorials	10/29/2010 2:12 PM	File fol
PerfLogs	7/13/2009 8:20 PM	File fol
Program Files	8/9/2010 5:38 PM	File fol
Program Files (x86)	12/30/2010 2:09 PM	File fol
ProgramData	12/16/2010 11:38 ...	File fol
Python25	7/22/2010 2:32 PM	File fol

File name:

All PowerPoint Presentations (*

OpenFileDialog Example

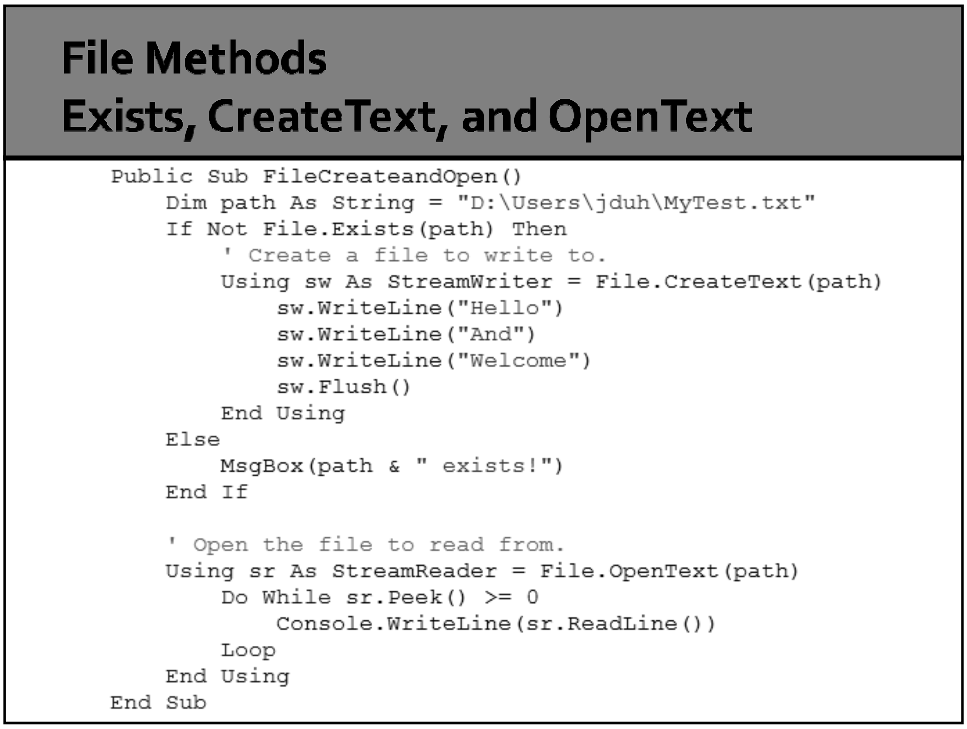
```
Dim openFileDialog1 As New OpenFileDialog()
openFileDialog1.InitialDirectory = "c:\"
openFileDialog1.Filter = "txt files (*.txt)|*.txt|All files (*.*)|*.*"
openFileDialog1.FilterIndex = 2
openFileDialog1.RestoreDirectory = True

If openFileDialog1.ShowDialog() = DialogResult.OK Then
    Try
        Using sr As StreamReader = File.OpenText(openFileDialog1.FileName)
            Do While sr.Peek() >= 0
                Console.WriteLine(sr.ReadLine())
            Loop
        End Using
    Catch Ex As Exception
        MessageBox.Show("Cannot read file. Original error: " & Ex.Message)
    End Try
End If
```

SaveFileDialog Example

```
Dim SaveFileDialog As New SaveFileDialog()
SaveFileDialog.Filter = "txt files (*.txt)|*.txt|All files (*.*)|*.*"
SaveFileDialog.FilterIndex = 1
SaveFileDialog.RestoreDirectory = True
SaveFileDialog.FileName = "shortest_path.txt"

If SaveFileDialog.ShowDialog() = DialogResult.OK Then
    Dim myStream As New StreamWriter(SaveFileDialog.FileName)

    If (myStream IsNot Nothing) Then
        Dim sb As New StringBuilder
        sb.AppendLine("Ten lines below...")

        For i As Integer = 1 To 10
            sb.AppendFormat("Line {0}", i)
        Next

        ' Code to write the stream goes here.
        myStream.Write(sb)
        myStream.Close()
        MsgBox("File saved!")
    End If
End If
```

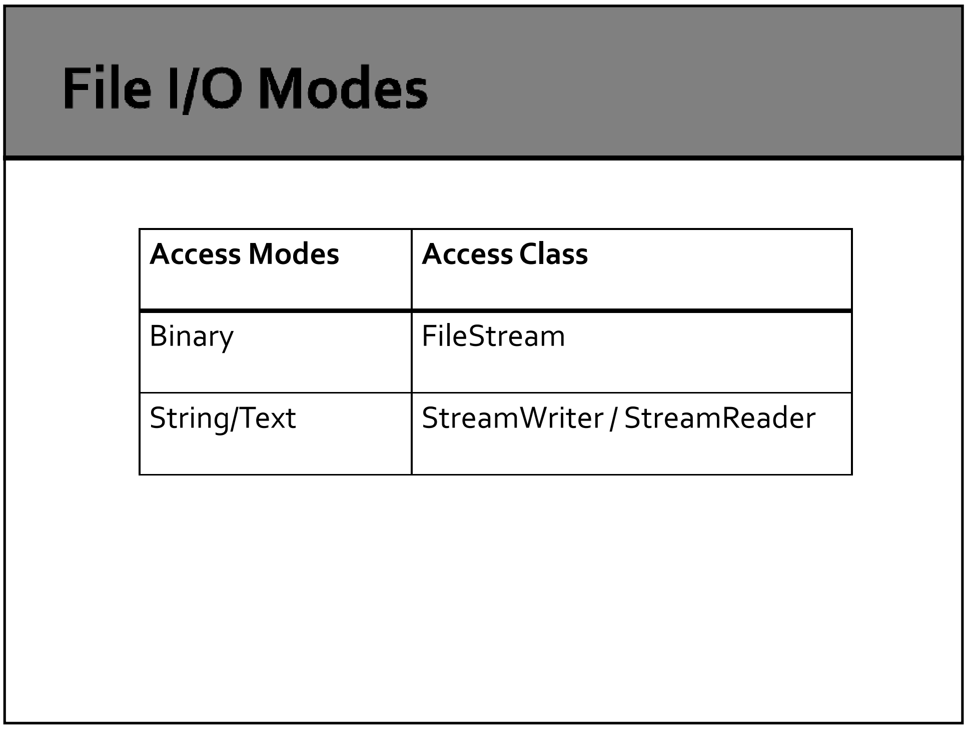
File Class – Static Methods

Method	Description
AppendAllLines	Appends lines to a file, and then closes the file.
AppendAllText	Opens a file, appends the specified string to the file, and then closes the file.
AppendText	Creates a StreamWriter that appends UTF-8 encoded text to an existing file.
Copy	Copies an existing file to a new file.
Create	Creates or overwrites a file in the specified path.
CreateText/OpenText	Creates or opens a file for writing UTF-8 encoded text.
Delete	Deletes the specified file.
Exists	Determines whether the specified file exists.
Move	Moves a specified file to a new location, providing the option to specify a new file name.
Open	Opens a FileStream on the specified path, with the specified mode and access.
WriteAllBytes	Creates a new file, writes the specified byte array to the file, and then closes the file.



File Methods
Exists, CreateText, and OpenText

```
Public Sub FileCreateandOpen()
    Dim path As String = "D:\Users\jduh\MyTest.txt"
    If Not File.Exists(path) Then
        ' Create a file to write to.
        Using sw As StreamWriter = File.CreateText(path)
            sw.WriteLine("Hello")
            sw.WriteLine("And")
            sw.WriteLine("Welcome")
            sw.Flush()
        End Using
    Else
        MsgBox(path & " exists!")
    End If

    ' Open the file to read from.
    Using sr As StreamReader = File.OpenText(path)
        Do While sr.Peek() >= 0
            Console.WriteLine(sr.ReadLine())
        Loop
    End Using
End Sub
```



File I/O Modes

Access Modes	Access Class
Binary	FileStream
String/Text	StreamWriter / StreamReader

Text I/O Classes - StreamReader & StreamWriter

- Constructor

```
Dim sw As StreamWriter = New StreamWriter(path)
Dim sr As StreamReader = New StreamReader(path)
```

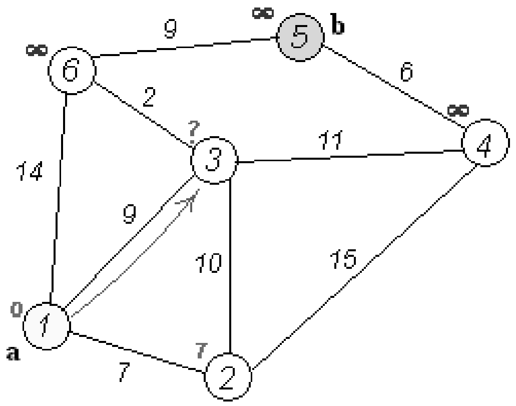
- Methods

```
sw.WriteLine("This line")
sw.Write(textObject)
sw.Flush()
sw.Close()

sr.ReadLine()
sr.Peek()
sr.Read()
sr.Close()
```

Lab 3. Dijkstra Shortest Path Algorithm

- Initialization
  - Assign to every node a distance value: set it to zero for our initial node and to infinity for all other nodes.
  - Mark all nodes as unvisited. Set initial node as current.
- Main search loop
  - For current node, consider all its unvisited neighbors and calculate their *tentative* distance (from the initial node). For example, if current node (A) has distance of 6, and an edge connecting it with another node (B) is 2, the distance to B through A will be 6+2=8. If this distance is less than the previously recorded distance (infinity in the beginning, zero for the initial node), overwrite the distance.
  - When we are done considering all neighbors of the current node, mark it as visited. A visited node will not be checked ever again; its distance recorded now is final and minimal.
  - If all nodes have been visited, finish. Otherwise, set the unvisited node with the smallest distance (from the initial node, considering all nodes in graph) as the next "current node" and continue from step 3.

http://en.wikipedia.org/wiki/Dijkstra%27s_algorithm


9
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3
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7
2