## CS4704 Lab
- T/TH 3:30 - 5:00pm
- Wes J. Lloyd, GTA
  - Office: 128 McBryde
  - Office Hours: 11:00 - 1:00 W
  - Email: wllloyd@vt.edu
  - Course Web Page: http://courses.cs.vt.edu/~cs4704

## Topics / Activities
- Belbin’s Leadership Roles
- Visual Basic GUI Design
- Java GUI Design
- Code Walkthroughs
- In-Lab Short Group Programming Projects
  - 3 people per group
  - 1 computer per group
  - 1 Project per class period

## Lab Grading
- Lab is 10% of the overall grade for cs4704
- Lab grade is entirely based on attendance and participation in the lab activities.

## Survey
- To determine student experience and background.
- Results to be made available

## Programming Projects
- Teams of (3) people each will be assigned to work on in-class programming projects.
- Average project will take about 1 hour to complete.
- Each group will have access to (1) computer in the lab.

## Microsoft Visual Basic
- Microsoft Product enhancement to Compiled Quick Basic
- Introduced in the early 1990’s
- Versions 1-3
  - Windows 3.X
  - Both DOS and Windows versions
  - 16-bit
  - VBX Controls
  - Read-Only object oriented programming
Microsoft Visual Basic

- Version 4
  - Major Rewrite from Assembly Language into C++
  - First 32-bit version
  - Support for Class creation, not controls, properties
  - Last 16-bit version
- Version 5
  - Support for Control Creation (ActiveX)
  - Support for Interfaces, Interface Inheritance
  - Events, and Raising Events
- Version 6
  - Substantial Web Enhancements

Microsoft Visual Basic

- "RAD" Rapid Application Development Tool
- Interpreted Language, but as of VB 4.0 can be compiled into EXEs
  - Large Run-Time DLLs files must accompany your programs.
- Has Enhanced System & Interface Prototyping in Industry

Microsoft Visual Basic

- Has helped create/promote the Prototyping Software Life Cycle
- Original Syntax is the same as BASIC
- Many many extensions beyond BASIC
- Other similar products
  - Delphi (Borland's Visual Pascal)
  - C++ Builder (Borland's Visual C++)

What Can You Do In Visual Basic?

- Call Windows API Calls
- Create Externally callable DLLs
  - Callable from VB itself and other languages
- Create ActiveX (OCX) controls
  - User controls which can be used in GUIs created in other languages and the web
- Create DCOM Client/Servers
- Create GUIs for ODBC databases
- Interface with TCP/IP sockets

What Can’t You Do In Visual Basic?

- Write a good quality compiler, or operating system.
- Use OO Inheritance
- Write blazingly fast math, or graphics intensive applications
- Write multi-threaded applications
  - It’s possible but requires jumping through many hoops

File Types

- Modules
- Forms
  - MDI Forms
  - Child Forms
  - Dialogs
- Classes
- User Controls
Add Ins / Enhancements
- ActiveX Controls (OCXs)
- DLLs
- VBXs

Events
- VB is an event based language
- There is a single thread of control which is interrupted by various System/GUI events.
- GUI interfaces to your program through events

Basic Controls
- 2 Types of Controls, Input and Display only
- Each resides on a different graphical layer

Input Controls
- Essentially always shaped like a rectangle
- To Windows, each Input control is a separate Window
- Can have the “Focus”
- On the top layer graphically

Display Controls
- Shape not always a rectangle
- Not an instance of a Window
- Not tracked as thoroughly by Windows
- Always behind/below Input Controls Graphically
Display Controls

- Label (lbl)
- Image (img)
- Shape
- Line
- Timer (tmr)

Examples