


COSC 1530



**Introduction to Computer Use II:
Programming**

Winter 2005 (Section M)

Topic A: Introduction to Problem Solving and Visual Basic

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Overview (1):

- ▣ **Before We Begin**
 - ▣ Some administrative details
 - ▣ Some questions to consider
- ▣ **Programming with Visual Basic 6.0**
 - ▣ Anatomy of a VB project
 - ▣ Running the project
 - ▣ Controls
 - ▣ Live Demo

Before We Begin

Administrative Details (1):

- **Lab Exercise 2-3**
 - From your textbook
 - Due Monday, January 16 2005 before noon
 - Place in the assignment drop-box located on the 1st floor of the CSE building just by the elevator and CSE undergraduate offices

Some Questions to Consider (1):

- What is a class ?
- What is an object ?
- What are properties ?
- What are the benefits of OOP ?
- What is a form ?
- What is a control ?

**Programming with MS
Visual Basic 6.0**

Anatomy of a VB Project (1):

▫ **Overview**

- VB programs are generally designed to respond to events initiated by the user via a GUI
 - User may click on a button, choose an option from the pull-down menu, write text in a text box etc.
- The GUI objects have properties that can be set → can thus control their size, position & other features
- Properties can be set in two ways
 - Design-time → by the programmer creating GUI
 - Run-time → by the program as it executes

Anatomy of a VB Project (2):

▫ **Overview (cont.)**

- Code (instructions) associated with each interface object
 - Defines what should happen when the user interacts with the object (e.g., when they press a button or move mouse over an area on the GUI)
- Review from first week
 - Such interactions are called **events**
 - **Event programming** → the act of defining what should happen in response to an event is

Running the Project (1):

▫ **Two Environment Modes**

- **Design mode**
 - This is where you are developing (designing) your GUI-based application
 - The program is not running

Running the Project (2):

- **Two Environment Modes (cont.)**
 - **Run mode**
 - The computer executes the program you designed
 - The program is now running as a separate **process** and accepting user interaction via the *GUI*
 - What happens in Run mode depends on your application and what you have programmed!
 - To place in Run mode: "**Menu → Run → Start**"
 - To stop the program running: "**Menu → Run → End**" or click on the "x" on the window's top right corner

Controls (1):

- **Adding Controls to a Form**
 - The toolbox contains many objects that can be placed on the form (e.g., control buttons, menu items etc.)
 - These objects are called controls → they form the *GUI* for the computer program through which the user is able to **control** the program's activities
 - To add control to form → select the desired control and drag it to the region within the *GUI* you wish to place it
 - You can also resize the control to any desired size you wish

Controls (2):

- **Certain Properties Associated With Every Control Object**
 - Properties control the appearance of the control
 - Recall → each control is an object of some class type
 - The class defines certain properties that each object of that class will contain
 - Any particular instance of the class (e.g., any object of the class) will have specific values for those properties → recall shape/square class - two objects of type square (sq1 and sq2) each have a length and width property but the actual values for length and width of each square may differ!

Controls (3):

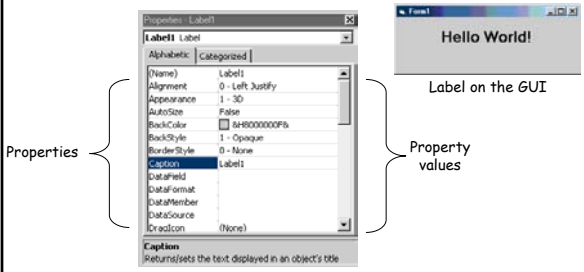
▪ Certain Properties Associated With Every Control Object (cont.)

- Example → "Label" control object (used to display text in within the GUI) includes properties such as
 - Name → name of the control
 - Caption → text associated with the control and displayed on the GUI
 - Font → font type and size of the displayed text
 - Height → height of the control (size)
- Control object properties can be set/changed via the "Properties window"

Controls (4):

▪ Certain Properties Associated With Every Control Object (cont.)

- Example → "Label" control object & its properties



Controls (3):

▪ How do we Access/Specify Control Properties within the Code ?

- "Standard" convention → `Control_Name.Property`
 - `Control_Name` → the name of the control (e.g., "Label1")
 - `"."` → period
 - `Property` → the desired property (e.g., "Caption")
- Example
 - `Label1.Caption` → refers to the Caption property of the control called "Label1"
 - Can assign it a value → `Label1.Caption = "Hello"`

Controls (5):

Control Event Handling

- Controls also have a mechanism for handling the many different types of possible user events
 - Example → control button can be pressed, mouse can be placed over it, can be activated with a particular key press
 - It is up to you to write the code (instructions) for handling each specific event you want to handle → although there are potentially many events a control can respond to, you don't have to define all of them only the ones you are interested in

Controls (6):

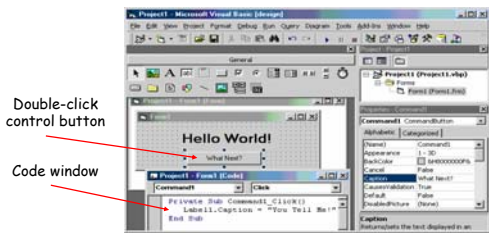
Control Event Handling (cont.)

- Basically, for each possible event, we have a separate **method** (function or sub-program) that will get called when the event on that control occurs
 - It is your responsibility to write these methods since the action to be performed in response to the event is program specific!
 - However, VB makes the task very easy for you → each of the potential events has a **method signature** and its simply a matter of you filling in the missing code

Controls (7):

Control Event Handling

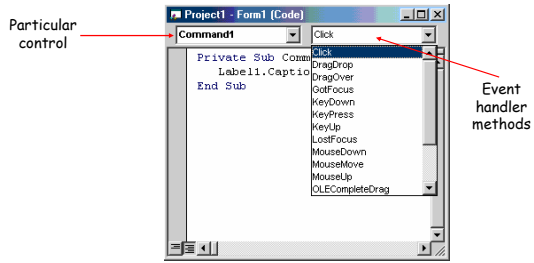
- So how do we access/write **event handler code** ?
 - Double-click on the control object → code window will appear



Controls (8):

- Control Event Handling

- Other available event handlers for control buttons



"Live Demo" (1):

- Live Demonstration of the Concepts Just Described Will Now be Given
