Putting It All Together

The basic constituents of algorithm design and programming have been introduced -- variables, assignment, conditionals, repetition and procedures. It is time to put them together to solve problems.

Review Of Constituents

- Variable -- named “container” to hold a value of a given type, e.g. hiMo, midPt
- Assignment -- to place a value into a variable using (in VB6.0) an “=”, e.g. midPt = loDate + 1
- Conditionals -- testing a value to determine which statement executes next, e.g If-Then-Else-End If and Select Case-End Select
- Iteration -- performing operations repeatedly using a loop, e.g. For-Next and Do While

All programming languages have these facilities, though the form is often slightly different.
Review Procedures

- There are two “sides” to procedures:
  - The “declaration” is where one defines the procedure’s behavior
    ```vbnet
    Private Sub sampleProc (firstParam As Integer)
      <code for the procedure’s operation goes here>
    End Sub
    ```
  - The “call” is where one directs that the procedure be performed
    ```vbnet
    Call sampleProc(someValue + anotherValue)
    ```
- Procedures save work … define a procedure’s operation once, and use it wherever it is needed

Terms And Conditions ...

- Procedures are used everywhere in VB6.0
  - Event procedures are “called” when the event happens, but you define what they do
  - Support procedures are procedures you define and call
As a task to illustrate the ideas introduced in the recent lectures, consider drawing stuff on the form:

```
BackColor
FillStyle = 0 'solid
```

For reference, the dots on the working form are separated by 135 twips.

```
ScaleMode = Twip
```

(QBColor(x) p. 389)

- 8
- 9
- 10
- 11
- 12
- 13
- 14
- 15
Drawing A Box

- The method for drawing a box is an extension of drawing a line...

```
Form1.Line (boxTop, boxLeft)-(boxTop + boxWidth, boxLeft + boxHeight), QBColor(9), B
```

Some VB6.0 Drawing ...

- Start things out by making the screen white ...

```
Private Sub Form_Load()
    FillStyle = 0           ' Draw in solid color
    BackColor = QBColor(15) ' Set background to white
End Sub
```

- ... And defining a procedure to draw a box

```
Private Sub boxDraw(boxTop As Integer, boxLeft As Integer, color As Integer)
    Form1.Line (boxTop, boxLeft)-(boxTop + 200, boxLeft + 200), QBColor(color), B
End Sub
```
And Call The Procedure

- Calling the procedure to draw a 200 x 200 box (that’s what drawBox is defined to do) positioned so its upper left hand corner is at (1000,1000) in Form1, and so that its color is blue

```vbnet
Private Sub Form_Click()
    Dim indx As Integer
    FillColor = QBColor(9)
    FillStyle = 0
    Call drawBox(1000, 1000, 9) ' Box is blue
End Sub
```

- Now, draw it 10 times, moving right ...

```vbnet
Private Sub Form_Click()
    Dim indx As Integer
    FillColor = QBColor(9)
    FillStyle = 0
    For indx = 1 To 10
        Call drawBox(1000+(300*I), 1000, 9) ' Box is blue
    Next indx
End Sub
```

Remembering Colors Is Tough ...

- Define a function to convert from names to QBColors

```vbnet
Private Function myColor(color As String) As Double
    FillStyle = 0
    Select Case color
        Case "black"
            myColor = QBColor(8) ' Set color to black
        Case "blue"
            myColor = QBColor(9) ' Set color to blue
        Case "green"
            myColor = QBColor(10) ' Set color to green
        Case "cyan"
            myColor = QBColor(11) ' Set color to cyan
        Case "red"
            myColor = QBColor(12) ' Set color to red
        Case "magenta"
            myColor = QBColor(13) ' Set color to magenta
        Case "yellow"
            myColor = QBColor(14) ' Set color to yellow
        Case "green"
            myColor = QBColor(15) ' Set color to white
        Case Else
            MsgBox "What color is " & color & "?" ' What?
    End Select
    FillColor = myColor
End Function
```
Drawing More Boxes

For indx = 1 To 50
    Call boxDraw(indx * 100, 100, "blue")
    Call boxDraw(indx * 100, 300, "magenta")
    Call boxDraw(indx * 100, 500, "red")
    Call boxDraw(indx * 100, 700, "yellow")
    Call boxDraw(indx * 100, 900, "green")
Next indx

And More Boxes With 2 Loops

Private Sub Form_Click()
    Dim outer As Integer, inner As Integer
    For outer = 1 To 10 Step 2
        For inner = 1 To 10 Step 2
            Call boxDraw(outer * 200, inner * 200, "blue")
        Next inner
        Next outer
    For outer = 2 To 10 Step 2
        For inner = 2 To 10 Step 2
            Call boxDraw(outer * 200, inner * 200, "red")
        Next inner
        Next outer
    End Sub