

## Putting It All Together



You've seen all the main programming ideas for FIT 100. Now it's time to bring it all together. The task is to use the computer medium for your self expression.

The form of expression will be the act of drawing something visually interesting on a form. In the process, you'll get experience writing procedures and controlling code flow in your program.

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## FIT 100 Project 3

- ❖ You choose the goal
  - ANYTHING (within the bounds of good taste) can be chosen
- ❖ We only have 5 requirements for what you turn in:
  - A procedure with 2 or more parameters
  - A procedure that calls another procedure of yours
  - A procedure that is called more than 5 times
  - A Do-While Loop
  - The use of a random number

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## FIT 100 Drawing On A Form

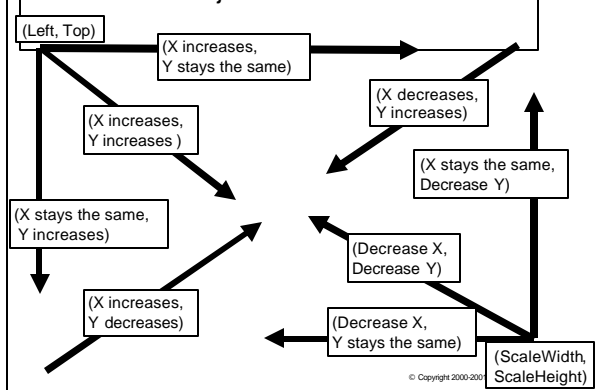
- ❖ The form in VB6 is logically divided into a grid, and a position is determined by noting how many grid points (units) it is from the Left and the Top

The unit is a twip

- The upper left corner is position (0,0)
- The position (x, y) is x units from Left and y units from Top
- Increasing the x value moves the position to the right
- Unlike graphing, though, increasing the y value moves it down
- The lower right corner is position (ScaleWidth, ScaleHeight)
- To resize the form, change ScaleWidth and ScaleHeight
- To make the window the size of the display, set WindowState = 2

|                 |                   |
|-----------------|-------------------|
| ScaleHeight     | 3195              |
| ScaleLeft       | 0                 |
| ScaleMode       | 1 - Twip          |
| ScaleTop        | 0                 |
| ScaleWidth      | 4680              |
| ShowInTaskbar   | True              |
| StartUpPosition | 3 - Windows Defau |
| Tag             |                   |
| Top             | 0                 |
| Visible         | True              |
| WhatsThisButton | False             |
| WhatsThisHelp   | False             |
| Width           | 4800              |
| WindowState     | 0 - Normal        |

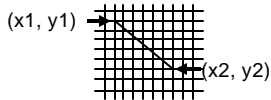
## How To Adjust X and Y Coordinates



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**FIT 100****Drawing A Line**

- ❖ To draw a line on Form1, call the procedure  
Form1.Line(x1, y1) – (x2, y2)



Notice the difference in syntax in this procedure call

- ❖ If there is only one form, the form name can be elided (not used)

Line(x1, y1) – (x2, y2)

- ❖ To get a color, follow the position coordinate information with the RGB color to be used

Form1.Line(x1, y1) – (x2, y2), RGB(255, 255, 255)

**FIT 100****Red, Green and Blue**

- ❖ Remember that colors are created on the screen with a combination of three colors of light –red, green, blue

- ❖ When drawing, you can indicate exactly the color wanted by calling a procedure: RGB(r, g, b)

The three parameters are the contributions of the three colors in the range 0 to 255

RGB (0, 0, 0)

RGB (255, 0, 0)

RGB (0, 255, 0)

RGB (0, 0, 255)

RGB (203, 31, 231)

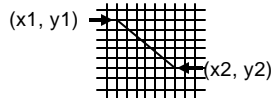
RGB (255, 204, 102)

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**FIT 100****Drawing A Box**

- ❖ Drawing a rectangle is like drawing a line EXCEPT that there is a final parameter "B" which stands for "box"

Line(x1, y1) – (x2, y2), RGB(r, g, b), B



- ❖ A specific fill color can be achieved by having two properties set

FillColor = RGB(r, g, b)

FillStyle = 0

'Fills any shapes with the color indicated

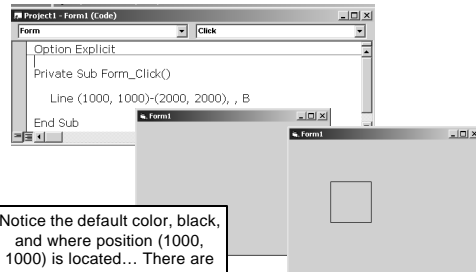
'There are 7 options for FillStyle this

'indicates opaque

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**FIT 100****Programming a Rectangle**

- ❖ To begin, draw a box in the Form\_Click event handler

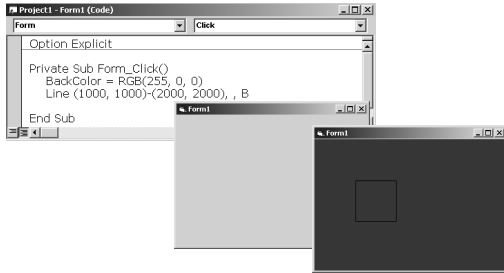


Notice the default color, black, and where position (1000, 1000) is located... There are ~1440 twips per inch

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## FIT 100 Color

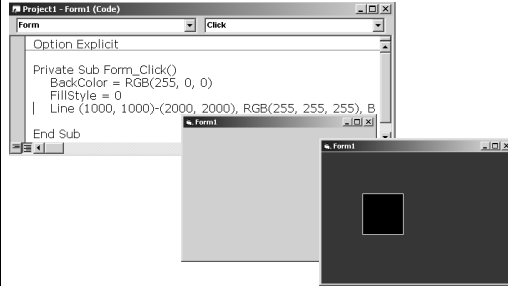
- ❖ How do you change the color of the form to red?



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## FIT 100 Spice Up That Form!!!

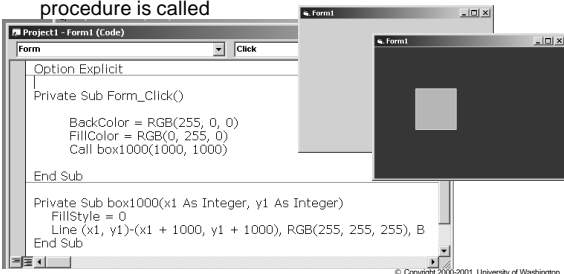
- ❖ Make the box fill with black and change the line to white



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## FIT 100 Draw A Box Using A Procedure Call

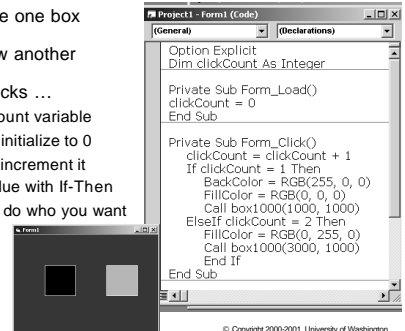
- ❖ Draw a 1000 x 1000 box with black fill and a white line
- ❖ The FillColor will be whatever color is set when the procedure is called



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## FIT 100 More Action, Please

- ❖ Click once, create one box
- ❖ Click again, show another
- ❖ Steps for multiclicks ...
  - Declare clickCount variable
  - In Form\_Load, initialize to 0
  - In Form\_Click, increment it
  - The test the value with If-Then
  - For each value do who you want on that click
- ❖ 1<sup>st</sup>: black box
- ❖ 2<sup>nd</sup>: green box



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## FIT 100 Add Another Option

- ❖ Increase the form size to cover whole screen
- ❖ Add another "click" case
  - WindowState has 3 values
  - Setting 2 maximizes form
  - Drawing box from (0,0) to (ScaleWidth, ScaleHeight) covers the entire form

```

Project1 - Form1 (Code)
Form Click
clickCount = 0
End Sub

Private Sub Form_Click()
    clickCount = clickCount + 1
    If clickCount = 1 Then
        BackColor = RGB(255, 0, 0)
        FillColor = RGB(0, 0, 0)
        Call box1000(1000, 1000)
    ElseIf clickCount = 2 Then
        FillColor = RGB(0, 255, 0)
        Call box1000(3000, 1000)
    ElseIf clickCount = 3 Then
        WindowState = 2
        FillColor = RGB(255, 0, 0)
        Line (0, 0)-(ScaleWidth, ScaleHeight), F
    End If
End Sub
    
```

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## FIT 100 To Give Motion, Draw On Interval of Timer

- ❖ Adding a timer allows changes to be made at regular intervals ... place the timer anywhere on the form ... then

```

Project1 - Form1 (Code)
tmrClock Timer
Option Explicit
Dim clickCount As Integer
Dim timerCount As Integer

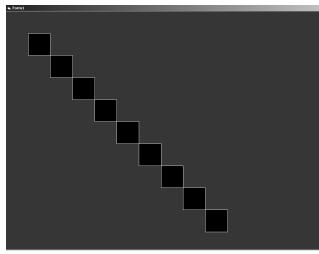
Private Sub Form_Load()
    clickCount = 0
    timerCount = 0
End Sub

Private Sub tmrClock_Timer()
    timerCount = timerCount + 1
    FillColor = RGB(0, 0, 0)
    Call box1000(timerCount*1000, timerCount*1000)
End Sub
    
```

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## FIT 100 Turn Timer On/Off With Click

- ❖ The 4<sup>th</sup> click starts box draw and the fifth click stops it



```

Project1 - Form1 (Code)
Form Click
End Sub

Private Sub Form_Click()
    clickCount = clickCount + 1
    If clickCount = 1 Then
        BackColor = RGB(255, 0, 0)
        FillColor = RGB(0, 0, 0)
        Call box1000(1000, 1000)
    ElseIf clickCount = 2 Then
        FillColor = RGB(0, 255, 0)
        Call box1000(3000, 1000)
    ElseIf clickCount = 3 Then
        WindowState = 2
        FillColor = RGB(255, 0, 0)
        Line (0, 0)-(ScaleWidth, ScaleHeight), F
    ElseIf clickCount = 4 Then
        tmrClock.Interval = 200
    Else
        tmrClock.Interval = 0
    End If
End Sub
    
```

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## FIT 100 Randomize!

- ❖ Just drawing the same box in the same location every time is boring...let's randomize location!

- ❖ To Place boxes randomly,
  - Initialize Randomize in Form\_Load
  - Declare xPos and yPos in tmrClock
  - Pick a random number in (0,1) range with a Rnd(1) procedure call
  - Multiply by the largest size to fill all screen areas & truncate to Integer

```

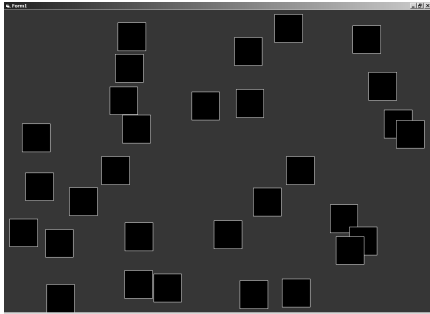
Project1 - Form1 (Code)
Form Load
Private Sub Form_Load()
    clickCount = 0
    timerCount = 0
    Randomize
End Sub

Private Sub tmrClock_Timer()
    Dim xPos As Integer, yPos As Integer
    timerCount = timerCount + 1
    FillColor = RGB(0, 0, 0)
    xPos = Int(Rnd * (ScaleWidth - 1000))
    yPos = Int(Rnd * (ScaleHeight - 1000))
    Call box1000(xPos, yPos)
End Sub
    
```

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## **FIT 100** One Result

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## **FIT 100** Examples

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❖ <http://courses.washington.edu/gbw/fit100/projects.htm>

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## **FIT 100** What if you.....

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- ❖ Randomize FillColors!
- ❖ Randomize FillStates!
- ❖ Randomize Box Size
- ❖ Allow users to enter numbers for coordinates or for colors and randomize those?
- ❖ Draw a flower or scene that has different colors every time?
- ❖ The possibilities are ENDLESS!!!

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## **FIT 100** AARON, by Harold Cohen

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<http://www.kurzweilcyberart.com/aaron/>

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