I Wish I Knew How To …

Program the Canvas Control with Xojo Desktop 2

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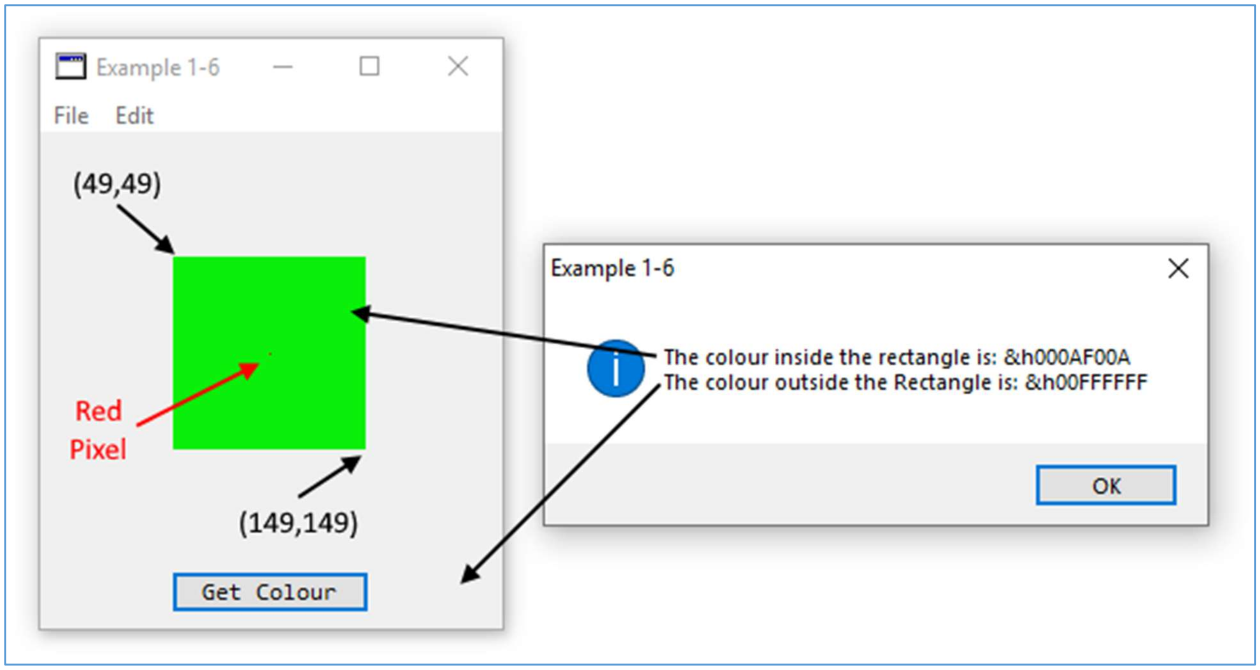
Pixel

A *Canvas* is made of many individual dots or pixels, and when a canvas has a width of 200 by 200, that means that there are 200 pixels in the *X* direction, and 200 pixels in the *Y* direction. Because *Canvas* pixels are zero-based, this means that the first of 200 pixels starts at zero (0), and the 200th pixel ends at 199. The pixel method in the graphics layer of the canvas can get or set the colour of the pixel.

Figure 9. Example 1-6: Screen Grab



The colour inside the rectangle is: &h000AF00A
The colour outside the Rectangle is: &h00FFFFFF

The above screen grab shows the results of the following code.

Code 23. Example 1-6: Draw Rectangle and Pixel Code

```
Sub Paint(g As Graphics, areas() As REALbasic.Rect) Handles Paint
  //Draw a green filled rectangle
  g.ForeColor = RGB(10, 240, 10) //Green
  g.FillRect(49, 49, 100, 100) //Filled Rectangle

  //Colour the centre pixel red
  g.Pixel(99, 99) = RGB(240, 10, 10)
End Sub
```

The top layer of the *Canvas* (ForeColor) is set to a green colour with the RGB values of 10 red, 240 green, and 10 blue. A filled rectangle is drawn with the upper-left hand coordinates of 49 and 49, with a width and height of 100 x 100. The filled rectangle is drawn from the pixel set 49,49 to 149,149. To draw the pixel at the very centre of the rectangle a red colour, the pixel set 99,99 is chosen (reminder: a 200x200 rectangle is zero-based and has dimensions from 0-199). The pixel is coloured to red with the RGB value of 240-Red, 10-Green, and 10-Blue.

The next code shows the hexadecimal colour value for a pixel which is inside the rectangle and has a green colour with the value &h000AF00A and is shown in a message box. The colour outside the rectangle is &h00F0F0F0.

Code 24. Example 1-6: PushButton1 Action Event

```
Sub Action() Handles Action
  Dim p as new Picture(Canvas1.Width, Canvas1.Height, 32)
  Canvas1.DrawInto(p.Graphics, 0, 0)
  //Get the pixel values outside and inside the Rectangle
  MsgBox "The colour inside the rectangle is: " + CStr(p.RGBSurface.Pixel(60,60)) + chr(13) +_
  "The colour outside the Rectangle is: " + CStr(p.RGBSurface.Pixel(20,20))
End Sub
```

Getting a colour can’t be performed in the Paint event, and an action event in a pushbutton has been added to retrieve the different colours.

This example draws a rectangle and pixel and then is able to read the colours and show the hexadecimal values to the user.

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The ‘I Wish I Knew’ series contains technical data and advice that makes sense and contains practical and numerous examples with explanations to allow you to ease into the steep programming curve. You can create custom canvas Desktop applications today!

Version 2 of this Canvas book is not just an update, but is a fundamental shift in drawing philosophy from the previous version. Many of the examples have been converted from using a PBuffer picture to a graphics Paint property. There are some examples where using a picture is the preferred method. This book “I Wish I Knew How to … Program Xojo’s Canvas Control” starts with the fundamentals of the Canvas on the Desktop and builds your knowledge in each chapter. It is assumed that the reader has a good fundamental understanding of programming with Xojo before reading this book, as this starts at an intermediate level. The basics of many topics are discussed to give an overview of fundamental concepts. Each of these topics can then be pieced together to create your own gaming, picture editing, or animation Michaelangelo masterpiece!

The book is written as a guide and reference to Xojo programmers who program Desktop Applications in Windows, Mac, and Linux (Ubuntu). There are no dynamic link libraries (dll), COM, or Active X parts to add. This code was tested with Xojo 2018 R4 on Windows, OS X Mojave 10.14.3, and Ubuntu 18.04.

There are 13 chapters and over 450 pages with over 60 example programs.

Examples include two games, animation, cropping, blurs, edge detection, pixilation and more. Many screenshots have been added to show the results of the code with an index to help find topics quickly.

This is one of many books at Xojo Library. This book can be purchased at http://xojolibrary.com/ where many great Xojo resources are available.

Happy programming!

Eugene

Eugene Dakin MBA, Ph.D., P.Chem., is an author of Xojo and Real Studio reference materials and has many years of experience in the programming industry.

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