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**CAMPUS ZONA ROSA**

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*LENGUAJES VISUALES*

FRACTALES

**16020386**

**CODIGO DEL PROGRAMA**

Imports System.Drawing

Public Class Form1

Dim i As Integer, j As Integer, escala As Integer, lineaX As Integer, lineaY As Integer, iteracion As Integer

Dim c\_re As Double, c\_im As Double, x As Double, y As Double, x\_temp As Double

Dim opcionA As Integer, opcionB As Integer, opcionC As Integer

Dim R As Integer, G As Integer, B As Integer

Dim Cr As Single

Dim Ci As Single

Dim bmp As Bitmap

Private Sub Button\_Graficar\_Click(sender As Object, e As EventArgs) Handles Button\_Graficar.Click

Repeticiones()

Anchura()

Seleccion()

End Sub

Private Sub Button\_Limpiar\_Click(sender As Object, e As EventArgs) Handles Button\_Limpiar.Click

Limpiar()

End Sub

Sub Repeticiones()

If Text\_Iteracion.Text = "" Then

iteracion = 1000

Else

iteracion = Text\_Iteracion.Text

End If

End Sub

Sub Anchura()

opcionB = ComboBox\_An.SelectedIndex

If opcionB = 0 Then

Picture\_Plano.Width = 160

Picture\_Plano.Height = 160

ElseIf opcionB = 1 Then

Picture\_Plano.Width = 320

Picture\_Plano.Height = 320

ElseIf opcionB = 2 Then

Picture\_Plano.Width = 480

Picture\_Plano.Height = 480

ElseIf opcionB = 3 Then

Picture\_Plano.Width = 640

Picture\_Plano.Height = 640

ElseIf opcionB = 4 Then

Picture\_Plano.Width = 800

Picture\_Plano.Height = 800

End If

End Sub

Sub Seleccion()

opcionA = ComboBox\_Op.SelectedIndex

opcionC = ComboBox\_Variantes.SelectedIndex

If opcionA = 0 Then

Mandelbrot()

ElseIf opcionA = 1 Then

If ComboBox\_Variantes.SelectedIndex = -1 Then

MsgBox("Selecciona la variante del fractal de julia.")

ElseIf opcionC = 0 Then

Cr = -0.72

Ci = 0.196

Julia()

ElseIf opcionC = 1 Then

Cr = 0.285

Ci = -0.01

Julia()

ElseIf opcionC = 2 Then

Cr = -0.8

Ci = 0.0

Julia()

ElseIf opcionC = 3 Then

Cr = 0.0

Ci = 0.8

Julia()

ElseIf opcionC = 4 Then

Cr = -0.8

Ci = -0.25

Julia()

End If

End If

End Sub

Sub Mandelbrot()

Dim width As Integer, heigth As Integer, Coll As Integer, Row As Integer, iteraciones As Integer

width = Picture\_Plano.Width

heigth = Picture\_Plano.Height

bmp = New Bitmap(width, heigth)

For Row = 0 To (Width - 1)

For Coll = 0 To (heigth - 1)

c\_re = (Coll - width / 2.0) \* 4.0 / width

c\_im = (Row - heigth / 2.0) \* 4.0 / heigth

iteraciones = 0

x = 0

y = 0

While iteraciones < iteracion And ((x \* x) + (y \* y)) <= 4

x\_temp = (x \* x) - (y \* y) + c\_re

y = 2 \* x \* y + c\_im

x = x\_temp

iteraciones = iteraciones + 1

End While

R = iteraciones Mod 128

G = iteraciones Mod 50 \* 5

B = iteraciones Mod 10

If iteraciones < iteracion Then

bmp.SetPixel(Coll, Row, Color.FromArgb(R, G, B))

Else

bmp.SetPixel(Coll, Row, Color.Black)

End If

Next Coll

Next Row

Picture\_Plano.Image = bmp

End Sub

Sub Julia()

Dim bmp As Bitmap

Dim i As Integer

Dim j As Integer

Dim k As Integer

Dim N As Integer

Dim paso As Integer

Dim delta As Single

Dim rr As Single

Dim a As Single

Dim B As Single

Dim an As Single

Dim a0 As Single

Dim b0 As Single

j = 0

k = 0

i = 0

N = iteracion

paso = 200

delta = 4 / Picture\_Plano.Width

a0 = -2.0

b0 = -2.0

bmp = New Bitmap(Picture\_Plano.Width, Picture\_Plano.Height)

For j = 1 To Picture\_Plano.Width - 1

For k = 1 To Picture\_Plano.Height - 1

a = a0 + j \* delta

B = b0 + k \* delta

i = 0

rr = 0

While i < N And (a \* a) + (B \* B) < 4

an = a \* a - B \* B + Cr

B = 2 \* a \* B + Ci

a = an

i = i + 1

End While

'If i < 100 Then

' bmp.SetPixel(j, k, Color.Black)

'Else

' bmp.SetPixel(j, k, Color.White)

'End If

If i < 5 Then

bmp.SetPixel(j, k, Color.Black)

ElseIf i >= 5 And i < 25

bmp.SetPixel(j, k, Color.Purple)

ElseIf i >= 25 And i < 50

bmp.SetPixel(j, k, Color.Blue)

ElseIf i >= 50 And i < 75

bmp.SetPixel(j, k, Color.DarkOrchid)

ElseIf i >= 75 And i < 100

bmp.SetPixel(j, k, Color.White)

ElseIf i >= 100 And i < 1001

bmp.SetPixel(j, k, Color.DarkSlateGray)

End If

Next k

Next j

Picture\_Plano.Image = bmp

End Sub

Sub Limpiar()

Picture\_Plano.Image.Dispose()

Picture\_Plano.Image = Nothing

Text\_Iteracion.Clear()

ComboBox\_An.Text = ""

ComboBox\_Op.Text = ""

ComboBox\_Variantes.Text = ""

End Sub

End Class

**CONTROLES**

|  |  |
| --- | --- |
| TIPO | NOMBRE |
| PictureBox | Picture\_Plano |
| TextBox | Text\_Iteracion |
| ComboBox | ComboBox\_An |
| ComboBox | ComboBox\_Op |
| ComboBox | ComboBox\_Variantes |
| Button | Button\_Graficar |
| Button | Button\_Limpiar |