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#####
# Fougère de Barnsley (en Python 3.4.3) 20 000 itérations
# d'après les paramètres de Wikipedia anglais : Barsley fern
# Utilise la librairie pédagogique graphics.py de John Zelle
# Cliquer dans la fenêtre pour sortir
#####
from graphics import *
from random import *

def f1(x,y):
    return 0.0, 0.16*y

def f2(x,y):
    u= 0.85*x + 0.04*y
    v= -0.04*x + 0.85*y + 1.6
    return u, v

def f3(x,y):
    u= 0.2*x - 0.26*y
    v= 0.23*x + 0.22*y + 1.6
    return u, v

def f4(x,y):
    u= -0.15*x + 0.28*y
    v= 0.26*x + 0.24*y + 0.44
    return u, v

def main():
    win = GraphWin("Fougère de Barnsley", 500, 500)
    win.setBackground('black')
    x = 0.0
    y = 0.0
    for i in range (0,20000):
        R = randint(1,1000) # donc 1 <= R <= 1000
        if R <=10:
            x,y = f1(x,y)
        elif R >= 11 and R <= 860:
            x,y = f2(x,y)
        elif R >= 861 and R <= 930:
            x,y = f3(x,y)
        elif R >= 931 and R <= 1000:
            x,y = f4(x,y)
        ptx = int(50*x) + 250
        pty = 500 - int(50*y)

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        pt = Point(ptx,pty)
        pt.setOutline('green')
        pt.draw(win)
win.getMouse()
win.close()

main()
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