

# Jeu de la vie de Conway

Référence plus récente pour un autre travail : [Game of Life with Python](#)

[Conway\\_Game\\_of\\_Life\\_2D-JK-2012.py](#)

```
#!/usr/bin/env python
# -*- coding: utf-8 -*-
"""A minimal implementation of Conway's Game of Life.

source : http://www.exolete.com/code/life
modified by par Jérémie Knoops, BA2 chimie UMONS, 2011-2012
cf. http://fr.wikipedia.org/wiki/Jeu_de_la_vie
& http://en.wikipedia.org/wiki/Conway%27s_Game_of_Life
Each cell's survival depends on the number of occupied nearest and
next-nearest neighbours (calculated in Grid::step). A living cell dies
of overcrowding or loneliness if it has more than three or fewer than
two neighbours; a dead cell is brought to life if it has exactly three
neighbours (determined in Cell::setNextState).
    Iain Haslam, June 2005.
"""

from tkinter import *
import time

#===== Definition des cellules =====
class Cell(Label):
    DEAD = 0
    LIVE = 1

    def __init__(self, parent):
Label.__init__(self, parent, relief="raised", width=2, borderwidth=1)
        self.bind("<Button-1>", self.toggle)
        self.displayState(Cell.DEAD)

    def toggle(self, event):
        self.displayState(1-self.state)

    def setNextState(self, numNeighbours):
        """Work out whether this cell will be alive at the next
iteration."""
        if self.state==Cell.LIVE and \
            (numNeighbours>3 or numNeighbours<2):
            self.nextState = Cell.DEAD
        elif self.state==Cell.DEAD and numNeighbours==3:
            self.nextState = Cell.LIVE
        else:
            self.nextState = self.state
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def stepToNextState(self):
    self.displayState(self.nextState)

def displayState(self, newstate):
    self.state = newstate
    if self.state==Cell.LIVE:
        self["bg"] = "black"
    else:
        self["bg"] = "white"

#===== Definition de la grille =====
class Grid:
    def __init__(self, parent, sizex, sizey):
        self.sizex = sizex
        self.sizey = sizey
        #numpy.zeros(sizex, sizey) is a better choice,
        #but an additional dependency might be rude...
        self.cells = []
        for a in range(0, self.sizex):
            rowcells = []
            for b in range(0, self.sizey):
                c = Cell(parent)
                c.grid(row=b, column=a)
                rowcells.append(c)
            self.cells.append(rowcells)

    def step(self):
        """Calculate then display the next iteration of the game of
        life.

        This function uses wraparound boundary conditions.
        """
        cells = self.cells
        for x in range(0, self.sizex):
            if x==0: x_down = self.sizex-1
            else: x_down = x-1
            if x==self.sizex-1: x_up = 0
            else: x_up = x+1
            for y in range(0, self.sizey):
                if y==0: y_down = self.sizey-1
                else: y_down = y-1
                if y==self.sizey-1: y_up = 0
                else: y_up = y+1
                sum = cells[x_down][y].state + cells[x_up][y].state + \
                    cells[x][y_down].state + cells[x][y_up].state + \
                    cells[x_down][y_down].state +
                    cells[x_up][y_up].state + \
                    cells[x_down][y_up].state +
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cells[x_up][y_down].state
        cells[x][y].setNextState(sum)
    for row in cells:
        for Cell in row:
            Cell.stepToNextState()
    print(self.calc())

def clear(self):
    for row in self.cells:
        for Cell in row:
            Cell.displayState(Cell.DEAD)

def modify(self, Coord):
    self.clear()
    for (x,y) in Coord:
        self.cells[x][y].displayState(Cell.LIVE)

def calc(self):
    n=0
    for row in self.cells:
        for Cell in row:
            if Cell.state==Cell.LIVE:
                n=n+1
    return n

def multistep(self):
    text1=KBvar1.get()
    try:
        ns=int(text1)
    except ValueError:
        ns = 1
    text2=KBvar2.get()
    try:
        delay=int(text2)
    except ValueError:
        delay = 0
    for a in range(ns):
        time.sleep(delay)
        self.step()
        self.update()

def update(self):
    for row in self.cells:
        for Cell in row:
            Cell.update_idletasks()

#===== Programme principal =====
root = Tk()
if __name__ == "__main__":
    Figures=[("Blinker",((0,1),(1,1),(2,1))),("Glider",((0,2),(1,0),(2,1),(
    1,2),(2,2))),("R-Pentomino",((0,1),(1,0),(1,1),(1,2),(2,0)))]

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upframe = Frame(root)
upframe.grid(row=0,column=0)
middleFrame =Frame(root)
middleFrame.grid(row=1,column=0)
bottomFrame= Frame(root)
bottomFrame.grid(row=2,column=0)
gr = Grid(upframe,30,30)

for i,fig in enumerate(FIGURES):
    Button(middleFrame,
           text=fig[0],
           command=lambda toto=fig:
                gr.modify(toto[1])). \
        grid(row=i,column=0)

###ajout
textlab1=Label(middleFrame, text='Number of steps:', width=15,
height=2, fg="black")
textlab1.grid(row=0,column=1)
KBvar1=StringVar()
KB1=Entry(middleFrame,textvariable=KBvar1,width=5)
KB1.grid(row=0,column=2)
textlab2=Label(middleFrame, text='Delay(sec):', width=15, height=2,
fg="black")
textlab2.grid(row=1,column=1)
KBvar2=StringVar()
KB2=Entry(middleFrame,textvariable=KBvar2,width=5)
KB2.grid(row=1,column=2)
###
buttonStep = Button(bottomFrame,text="Step",command=gr.multistep)
buttonStep.grid(row=1,column=1)
buttonCalc = Button(bottomFrame,text="Calculate",command=gr.calc)
buttonCalc.grid(row=1,column=2)
buttonClear = Button(bottomFrame,text="Clear",command=gr.clear)
buttonClear.grid(row=1,column=3)
buttonQuit = Button(bottomFrame,text="Quit",command=root.destroy)
buttonQuit.grid(row=1,column=4)

root.mainloop()
```

## Références

- <http://www.exolete.com/code/life>
- [http://fr.wikipedia.org/wiki/Jeu\\_de\\_la\\_vie](http://fr.wikipedia.org/wiki/Jeu_de_la_vie)
- [http://en.wikipedia.org/wiki/Conway%27s\\_Game\\_of\\_Life](http://en.wikipedia.org/wiki/Conway%27s_Game_of_Life)

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Last update: **2021/03/09 11:29**

