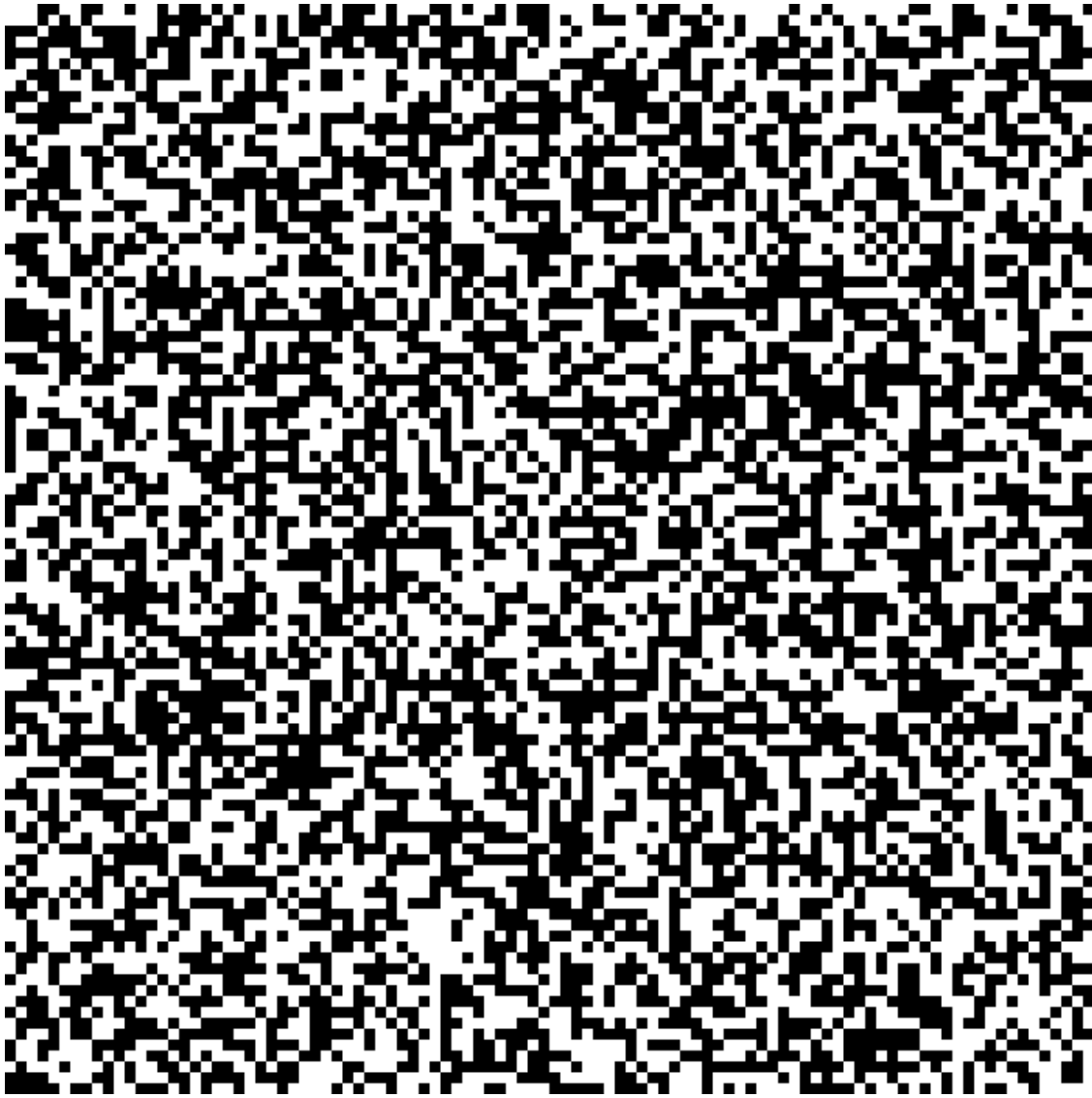


# Conways

November 7, 2019

```
In [6]: from sage.misc.prandom import randrange
        from sage.misc.randstate import current_randstate
        (col,row)=(100,100)
        ar3 = [[randrange(2) for i in range(col)] for j in range(row)]

In [7]: from sage.repl.image import Image
        img = Image('RGB', (600, 600), 'white')
        pixels = img.pixels()
        for j in range(6):
            for i in range(6):
                for x in range(100):
                    for y in range(100):
                        pixels[i+x+x+x+x+x,j+y+y+y+y+y+y] = (255*(ar3[x][y]),255*(ar3[x][y]))
        p=img.show()
        img.save('t--2.png')
```



```
In [8]: ar2 = [[0 for i in range(col)] for j in range(row)]
        for i in range(col):
            for j in range(row):
                if(i!=0 and j!=0 and i!=(col-1) and j!=(row-1)):
                    ar2[i][j]=ar3[i-1][j+1]+ar3[i-1][j-1]+ar3[i-1][j]+ar3[i][j+1]+ar3[i+1][j+1]
                elif(i==0):
                    if(j!=0 and j!=(row-1)):
                        ar2[i][j]=ar3[i][j+1]+ar3[i][j-1]+ar3[i+1][j+1]+ar3[i+1][j]+ar3[i+1][j-1]
                    elif(j==0):
                        ar2[i][j]=ar3[i][j+1]+ar3[i+1][j]+ar3[i+1][j+1]
                    elif(j==(row-1)):
                        ar2[i][j]=ar3[i][j-1]+ar3[i+1][j]+ar3[i+1][j-1]
                elif(i==(col-1)):
```

```

        if(j!=0 and j!=(row-1)):
            ar2[i][j]=ar3[i][j+1]+ar3[i][j-1]+ar3[i-1][j+1]+ar3[i-1][j]+ar3[i-1][j-1]
        elif(j==0):
            ar2[i][j]=ar3[i][j+1]+ar3[i-1][j]+ar3[i-1][j+1]
        elif(j==(row-1)):
            ar2[i][j]=ar3[i][j-1]+ar3[i-1][j]+ar3[i-1][j-1]
    else:
        if(j==0):
            ar2[i][j]=ar3[i-1][j]+ar3[i+1][j]+ar3[i+1][j+1]+ar3[i-1][j+1]+ar3[i][j+1]
        else:
            ar2[i][j]=ar3[i-1][j]+ar3[i+1][j]+ar3[i-1][j-1]+ar3[i][j-1]+ar3[i+1][j-1]
    if(ar3[i][j]==1):
        if(ar2[i][j]==2 or ar2[i][j]==3):
            ar2[i][j]=1
        else:
            ar2[i][j]=0
    else:
        if(ar2[i][j]==3):
            ar2[i][j]=1
        else:
            ar2[i][j]=0

for j in range(6):
    for i in range(6):
        for x in range(100):
            for y in range(100):
                pixels[i+x+x+x+x+x,x+j+y+y+y+y+y+y] = (255*(ar2[x][y]),255*(ar2[x][y]))
img.show()
img.save('t--1.png')

```



```
In [9]: for u in range(40):
        ar3=ar2
        ar2 = [[0 for i in range(col)] for j in range(row)]
        for i in range(col):
            for j in range(row):
                if(i!=0 and j!=0 and i!=(col-1) and j!=(row-1)):
                    ar2[i][j]=ar3[i-1][j+1]+ar3[i-1][j-1]+ar3[i-1][j]+ar3[i][j+1]+ar3[i+1][j]
                elif(i==0):
                    if(j!=0 and j!=(row-1)):
                        ar2[i][j]=ar3[i][j+1]+ar3[i][j-1]+ar3[i+1][j+1]+ar3[i+1][j]+ar3[i+1][j+1]
                    elif(j==0):
                        ar2[i][j]=ar3[i][j+1]+ar3[i+1][j]+ar3[i+1][j+1]
                    elif(j==(row-1)):
                        ar2[i][j]=ar3[i][j]+ar3[i+1][j]+ar3[i+1][j+1]
```

```

        ar2[i][j]=ar3[i][j-1]+ar3[i+1][j]+ar3[i+1][j-1]
elif(i==(col-1)):
    if(j!=0 and j!=(row-1)):
        ar2[i][j]=ar3[i][j+1]+ar3[i][j-1]+ar3[i-1][j+1]+ar3[i-1][j]+ar3[i-1][j-1]
    elif(j==0):
        ar2[i][j]=ar3[i][j+1]+ar3[i-1][j]+ar3[i-1][j+1]
    elif(j==(row-1)):
        ar2[i][j]=ar3[i][j-1]+ar3[i-1][j]+ar3[i-1][j-1]
else:
    if(j==0):
        ar2[i][j]=ar3[i-1][j]+ar3[i+1][j]+ar3[i+1][j+1]+ar3[i-1][j+1]+ar3[i-1][j-1]
    else:
        ar2[i][j]=ar3[i-1][j]+ar3[i+1][j]+ar3[i-1][j-1]+ar3[i][j-1]+ar3[i+1][j-1]
if(ar3[i][j]==1):
    if(ar2[i][j]==2 or ar2[i][j]==3):
        ar2[i][j]=1
    else:
        ar2[i][j]=0
else:
    if(ar2[i][j]==3):
        ar2[i][j]=1
    else:
        ar2[i][j]=0
for j in range(6):
    for i in range(6):
        for x in range(100):
            for y in range(100):
                pixels[i+x+x+x+x+x,x+j+y+y+y+y+y+y] = (255*(ar2[x][y]),255*(ar2[x][y]),255*(ar2[x][y]))
img.save('t-%s.png' % (u))

```