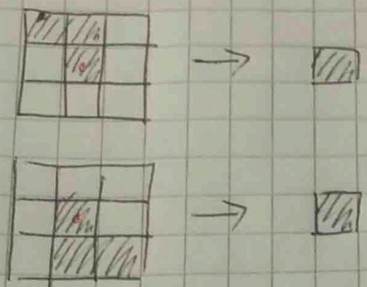
A.16 Characterize the rule of Conway's Game of Life.

• Silent State

• Symmetric : symmetric patterns have same number of alive neighborhood.

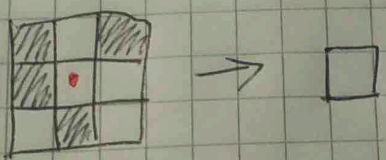
e.g.



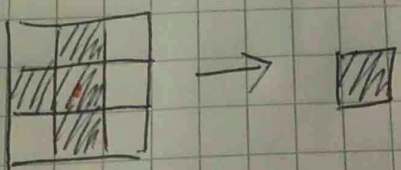
• legal : symmetric rule and has a silent state.

• Totalistic : NOT Totalistic.

~~Because~~

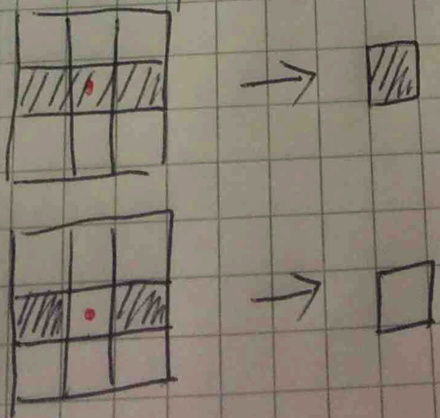


sum of neighborhood =4



sum of neighborhood = 4

• Peripheral : NOT Peripheral



~~Con glom infine~~

A.17 Gosper's Glider Gun proved that there exists patterns that can grow infinitely.

A.18. r-pentomino.

class IV. Complex, Patterns, "Self Organization"

∴ The pattern is stabilised at ~~1103~~ generation 1103, meanwhile it generates 6 gliders.

~~It shows~~ ~~complex~~

The pattern shows that the cells are interacting with other cells continuosly.

It generates several patterns that are in several different classes, but they ~~made~~ make variations due to the interaction with other patterns.

e.g. A toad forms at generation 737 and a beacon at generation 744, (both are oscillators) but both are destroyed by the activity at 751 and 754 respectively.

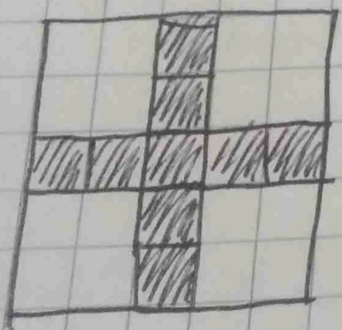
1. Two dimensional Cellular Automata are used for random number generation.

~~It shows~~ ~~complex~~
The pattern shows that the cells are interacting with other cells continuously.
It generates several patterns that are in several different classes, but they ~~made~~ make variations due to the interaction with other patterns.
e.g. A toad forms at generation 737 and a beacon at generation 744, (both are oscillators) but both are destroyed by the activity at 751 and 754 respectively.

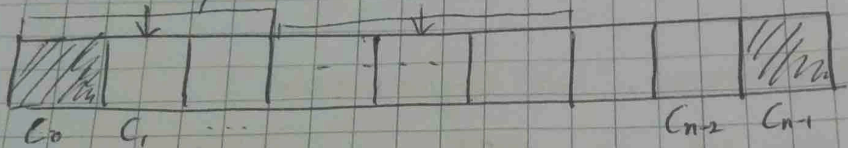
A.21. Two dimensional Cellular Automata are used for random number generation.

reference: Tomassini, M.; Sipper, M.; Perrenoud, M. (2000). "On the generation of high-quality random numbers by two-dimensional cellular automata". IEEE Transactions on Computers 49 (10): 1746-1757.

A.22



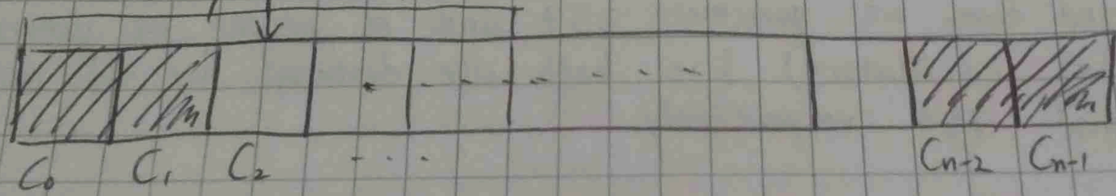
A.23. ⊙ Fixed Boundary. $d=1$, $k>2$, $r=2$



- C_0, C_{n-1} are fixed values.
  - $C_0(t+1) = C_0(t)$
  - $C_{n-1}(t+1) = C_{n-1}(t)$
- others are decided by neighbors.

$$C_i(t+1) \Leftarrow C_{i-1}(t),\ C_i(t),\ C_{i+1}(t)$$

⊙ Fixed Boundary. $d=1$, $k>2$, $r=3$

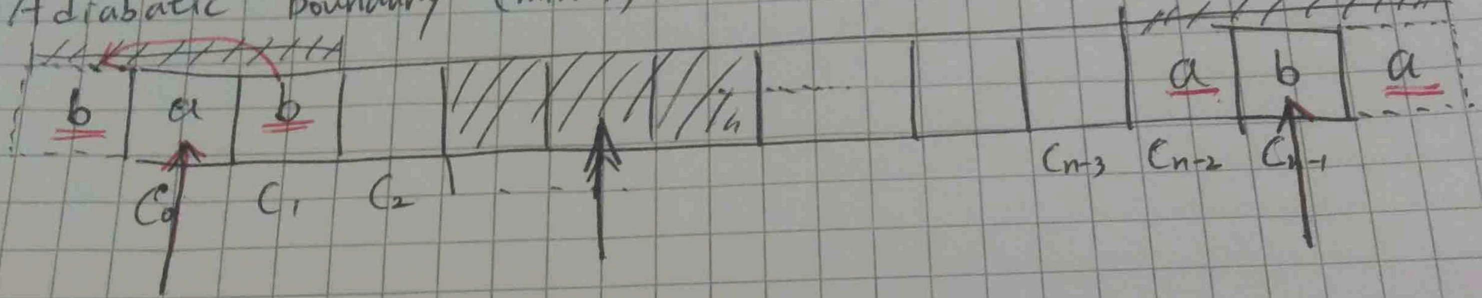


- C_0, C_1, C_{n-2}, C_{n-1} are fixed values
  - $C_0(t+1) = C_0(t)$
  - $C_1(t+1) = C_1(t)$
  - $C_{n-2}(t+1) = C_{n-2}(t)$
  - $C_{n-1}(t+1) = C_{n-1}(t)$
- others are decided by neigbors

$$C_i(t+1) \Leftarrow C_{i-2}(t),\ C_{i-1}(t),\ C_i(t),\ C_{i+1}(t),\ C_{i+2}(t)$$

A.23 Continue.

① Adiabatic Boundary (mirror) $d=1,\ k\geq 2,\ r=2$



② Adiabatic Boundary (mirror) $d=1,\ k\geq 2,\ r=3$