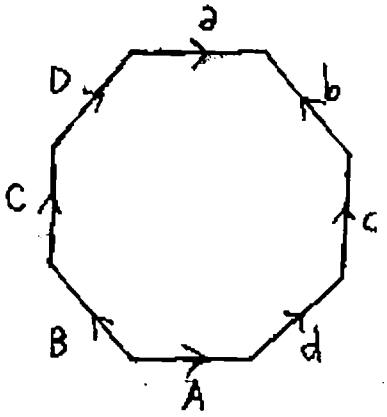
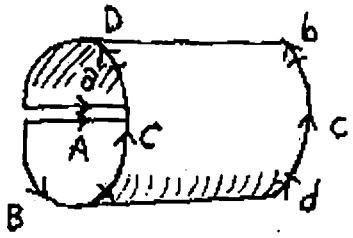
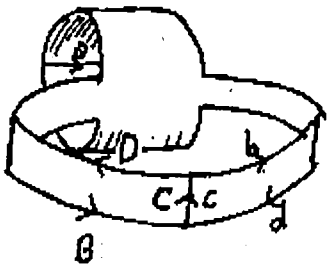
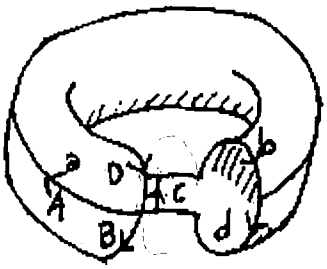
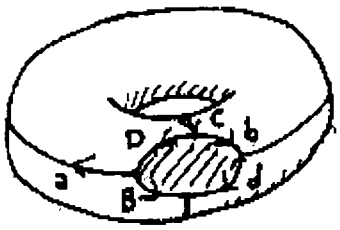
Dec 1 Review 1

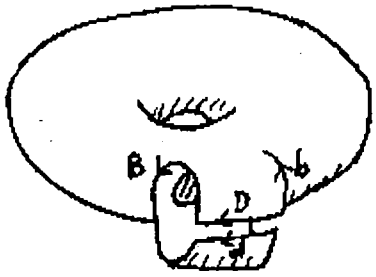


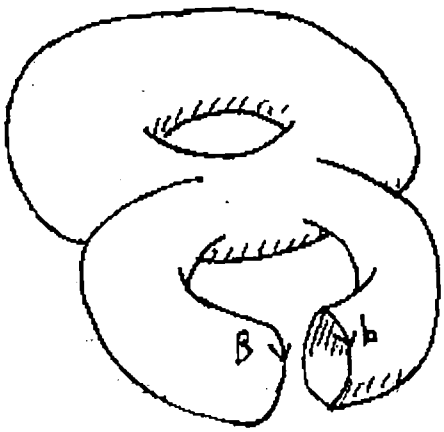


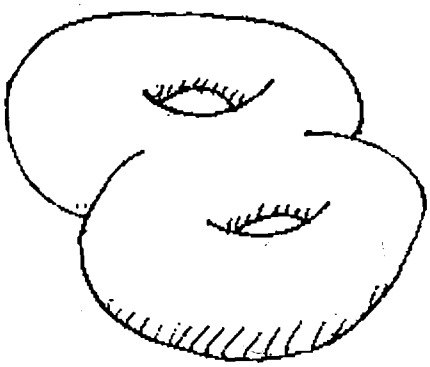












Wolfram classes of CA behavior

Class 1. homogeneous - after an initial transient period, everything dies (or everything becomes alive)

Class 2. periodic. after an initial transient period, a repeating pattern occupies the state space

Class 3. chaotic. Complicated pattern of triangles, of different sizes, exhibiting sensitivity to initial conditions: changing a single cell in the initial distribution gives rise to an ever-growing difference between the first run of the CA and the modified run.

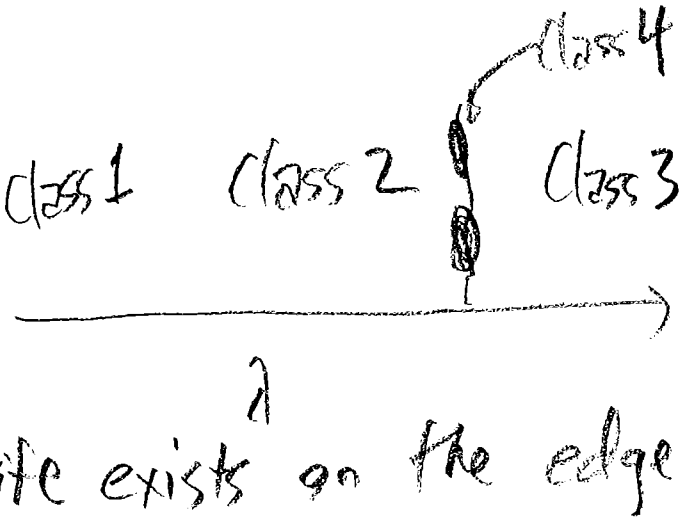
Class 4. Complex. "Life-like" Transport patterns across the state space (gliders in Life), and the background is stable patterns (blocks in Life)

gliders ⟷ transmit information

blocks ⟷ memory

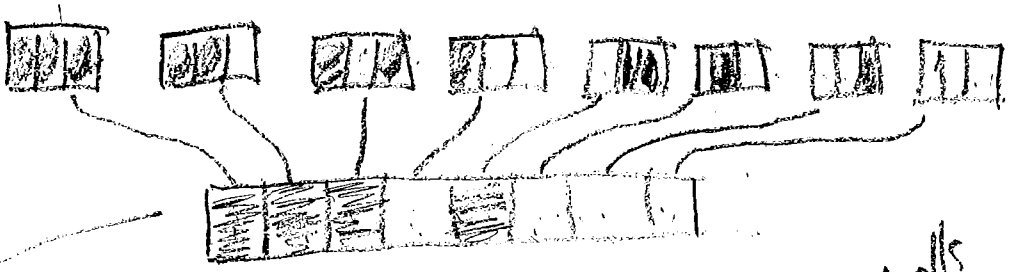
Langton's Lambda parameter

$$\lambda = \frac{\text{number of nbhd configs giving live cell}}{\text{total number of nbhd configs}}$$



Life exists on the edge of chaos

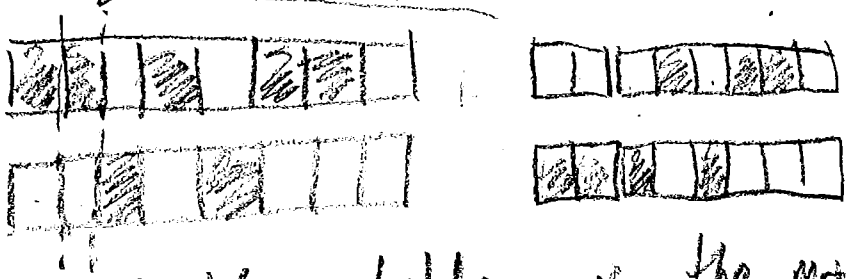
N=3 CA



majority rules CA: If 2 or 3 nbhd cells are alive, in the next gen the central cell lives.
If 0 or 1 nbhd cells are alive, in the next gen the central cell dies.

This is the genotype of the majority rules CA

Find a crossover point for these two CA



majority rules.

so one of their children is the majority rules CA.