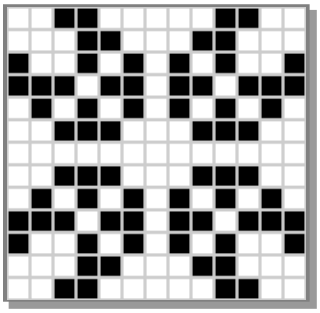
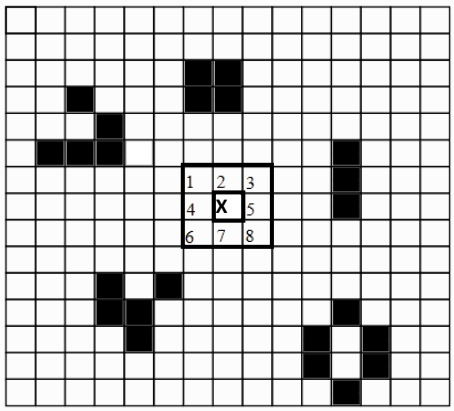


Project: LifeSim(GameOfLife)

General Information

LifeSim is a simple life simulation program. The simulation takes place on a two-dimensional grid of 16x32 square cells. Each square cell can be either alive or dead (full/"o" or empty/".").

The simulation is carried out with generation steps; at every step, all the cells on the area can switch from dead to alive, or alive to dead, depending on four simple rules that only depend on a given cell's eight immediate neighbours.



Evolution Rules

- **Birth:** Any dead cell with exactly three live neighbours becomes a live cell.
- **Survival:** Any live cell with two or three live neighbours lives in the next generation.
- **Death by loneliness:** Any live cell with fewer than two live neighbours dies, as in under-population.
- **Death by overcrowding:** Any live cell with more than three live neighbours dies, as in over-population.

Special Particles

Simulation begins with empty 16x32 cell grid. User can place some special particles (3*3) by using cursor movements and special keys at any simulation step. Cells can overlap (by using OR operation) with the existing cells. Cells out of border are ignored.

The particles that are shown below, will be created statically (Particle-Q, W, E) and randomly (Particle-R). Number of alive cells (o's) for Particle-R should be assigned randomly as 4, 5 or 6.

Particle-Q	Particle-W	Particle-E	Particle-R
Rotation: 1	2		4

- **Particle placement (Q, W, E, R):** Particles are placed (key Q, W, E, R) into the simulation area based on the center of the particle using **direction** keys (right, left, up, down).
- **Particle rotation (1, 2, 4):** Key 1, 2, 4 can be used to rotate a specific particle (particle Q, W, R) 90 degrees in clockwise direction.

- **Cell deletion (3):** Key **3** is used to delete a single cell where cursor is on.
- **Clear screen (0):** Key **0** is used to clear simulation area.
- **Generate new random particle (T):** User can generate new particle-R using key **T**.
- **Generate new random particle and place randomly (Y):** User can generate new particle-R and place randomly by using key **Y**.
- **Generate next step (space):** When user presses **space** key, the next iteration of the simulation is calculated and printed.

Sample Simulation Screens