Conway's Game of Life

Fall Semester

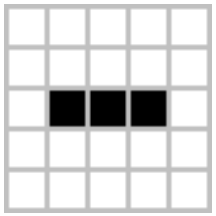
Topic Outline

- Rules
  - Staying alive
  - Returning from the dead
- Formations
  - Blinkers
  - Gliders
  - The glider gun
- Parallel
  - Decomposition: strips
  - Decomposition: cells
  - Verification
- Up Next: Heat Equation

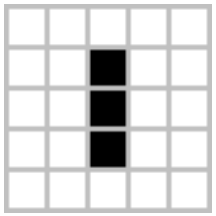
Rules

- Classic:
  - Currently alive? Stay alive if you have two or three alive neighbors (among eight neighbors).
  - Currently dead? Come back to life if you have exactly three alive neighbors.
- Run an entire time-step before updating to the new values.
- Initial configuration may be random or loaded from a file.
- User interaction may set/unset particular cells.
- Values may wrap or not around the edges.

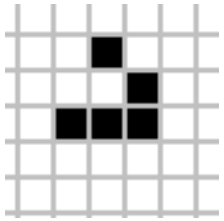
Formations: Blinker (1)



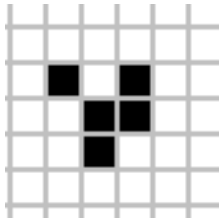
Formations: Blinker (2)



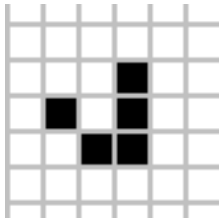
Formations: Glider (1)



Formations: Glider (2)

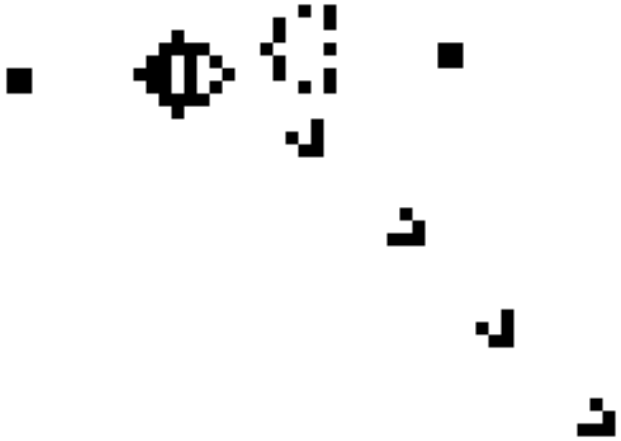


Formations: Glider (3)



Formations: Glider Gun (1)

Formations: Glider Gun (2)



Formations: Glider Gun (3)

Formations: Glider Gun (4)

Parallel: Strips

- Cut only horizontally or only vertically.
- Scales poorly.

Parallel: Cells

- Cut horizontally and vertically.
- Watch for the corner cases.

Parallel: Verification

- If the formations evolve correctly then the communication is probably working correctly.
- If not, there isn't much other than the communication that could be wrong.

Lab Assignment: Conway's Game of Life

- Choose to decompose via strips or cells.
- Run in parallel.
- Do the formations show up correctly?