

Cellular Automata Simulator

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Proposal

The purpose of this project is to parallelize the calculation of cellular automata. A well-known cellular automaton is Conway's Game of Life. In a cellular automaton, a cell's state in the next time step depends on its previous state, as well as its neighboring cells' states. This locality means this algorithm is highly amenable to parallelization.

A possible way to architect this parallelism would be to subdivide a grid of cells into subgrids, and assign tasks to compute the state of the grid in the next time step. One edge case to handle would be the edge cells which are adjacent to cells in other grids. This means that each subgrid must read adjacent subgrids as well to compute a new subgrid.

The program will feature a way to read in an initial state for the simulation, along with the number of time steps to simulate before finishing. There should be a way to output the results to a file, possibly to be fed back into the program to continue the simulation.

Specifications (not final)

- Can input dimensions and initial state of cellular automaton
- Can simulate to certain time step
- Can print output to file