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TM Cella Rule 150 Complexity Order
Team MPP

The bottleneck of this application is in draw-stuff.js, in the function draw_cells(rctx).

There is one double for-loop in this function: one to initialize all of the arrays and create the cell objects. The loop size is determined by the input height (n) and width (m) of the grid.
In this double for-loop, the following significant operations occur:

- Initialize n+m arrays: O(n)
- Create cell objects at every index of the 2D array: O(n^2)

By nature of dominating terms, this double for-loop is O(n^2).

The rest of the function is dedicated to manipulating the TM head to move, read, and write new cell states.

The TM head operations all run in O(1) time. To write a new cell state, the TM head performs 8 operations. The TM head performs n writes per row. Once it reaches the end of the row, the TM head performs n operations to return back to the left side of the grid. It does this for m rows.

The overall time complexity of this application is O(n^2).