

Utilizing JSXGraph to Implement John Conway's Game of Life

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What is game of life? :

The Game of Life is a cellular automation model devised by the mathematician John Horton Conway from Cambridge University. It came to become well-known for the article published at Scientific American in 1970.

Rules of the Game of Life: The universe of the Game of Life is an infinite, two-dimensional orthogonal grid of square cells, each of which is in one of two possible states, alive and dead, (or populated and unpopulated, respectively). Every cell interacts with its eight neighbors, which are the cells that are horizontally, vertically, or diagonally adjacent. At each step in time, the following transitions occur:

1. For a box with a live cell:

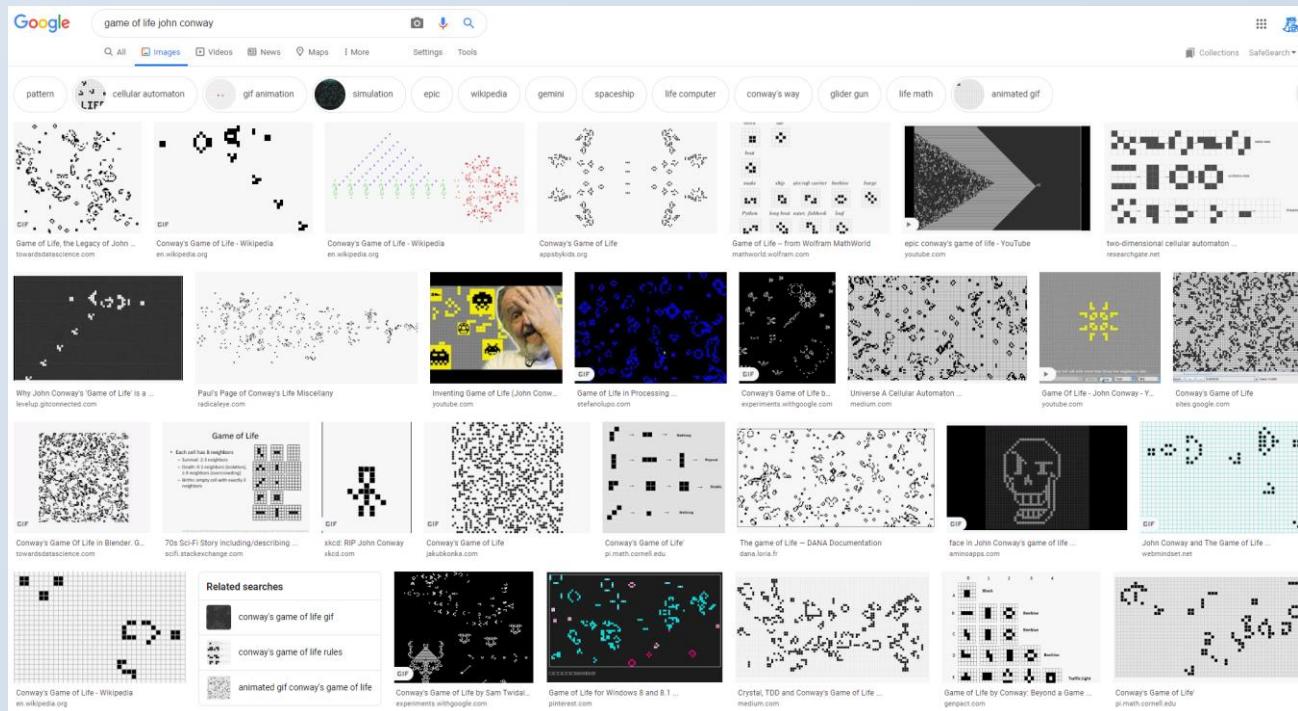
1. There existing fewer than two live neighbors, the cell dies, due to isolation.
2. There existing more than three live neighbors, the cell dies, due to over-crowding.
3. There existing two or three live neighbors, the cell lives on to the next generation.

2. For an empty box or a box with a dead cell:

1. There existing three live neighbors, the box generates a new live cell, as if by reproduction.

MOTIVATION:

Not able to spot an elegant and appealing implementation of game of life when searching in google



Just use vanilla box
to represent cell?

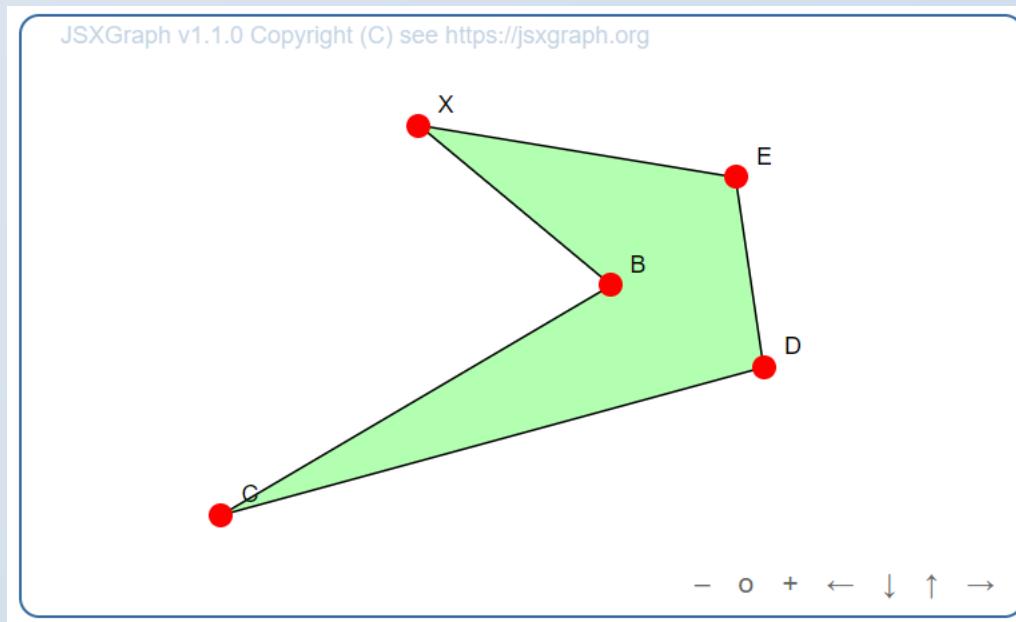
&

Always Black and White?

Bad User Experience!

MOTIVATION:

Came across JSXGraph by chance and
be obsessed with its fabulous UI



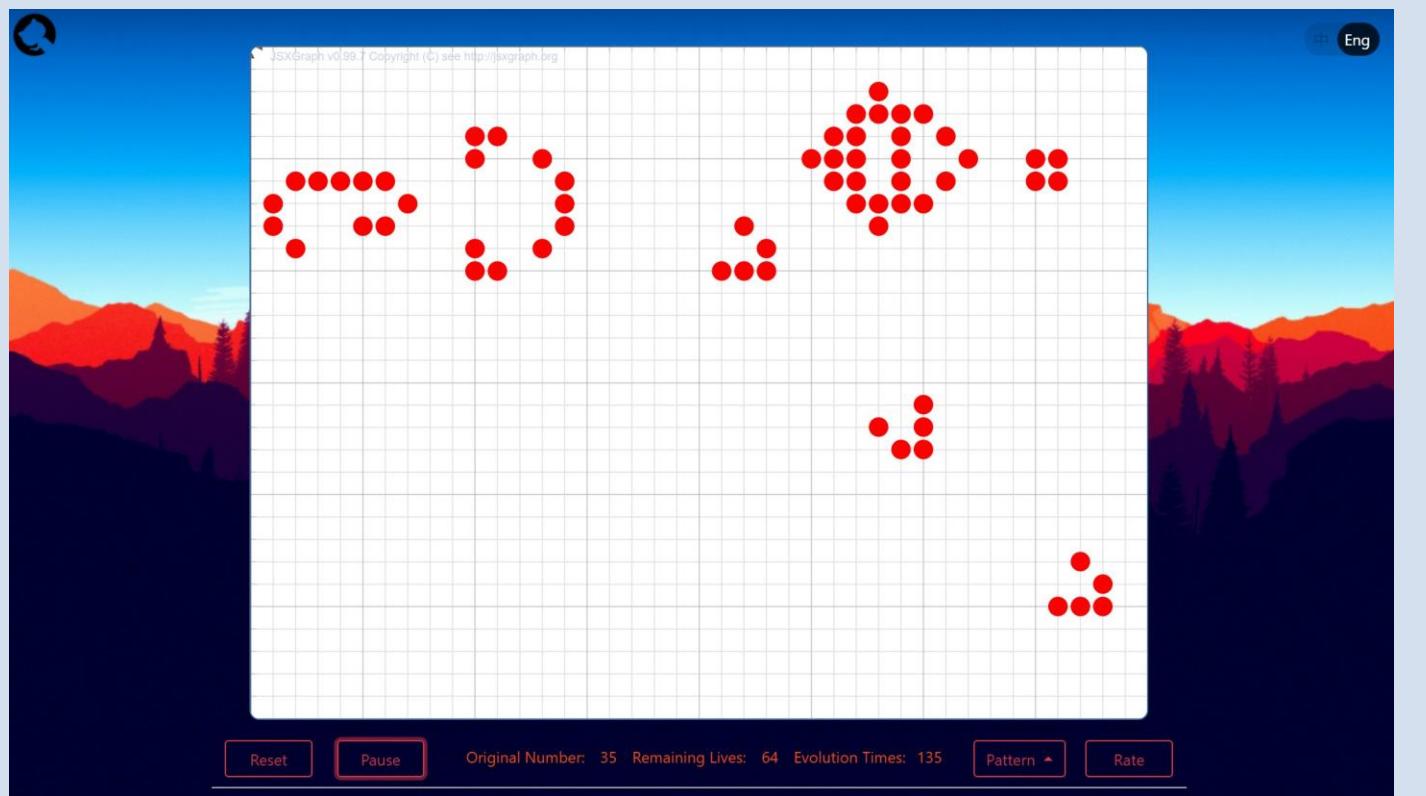
Impressed by the red point element
Nice to represent cell

&

Overwhelmed by JSXGraph's detailed
documentation and examples

Just do it!

RESULT: <https://playgameoflife.live>



PEACEFUL LAYOUT

CONSIDERATE
INTERACTIVITY

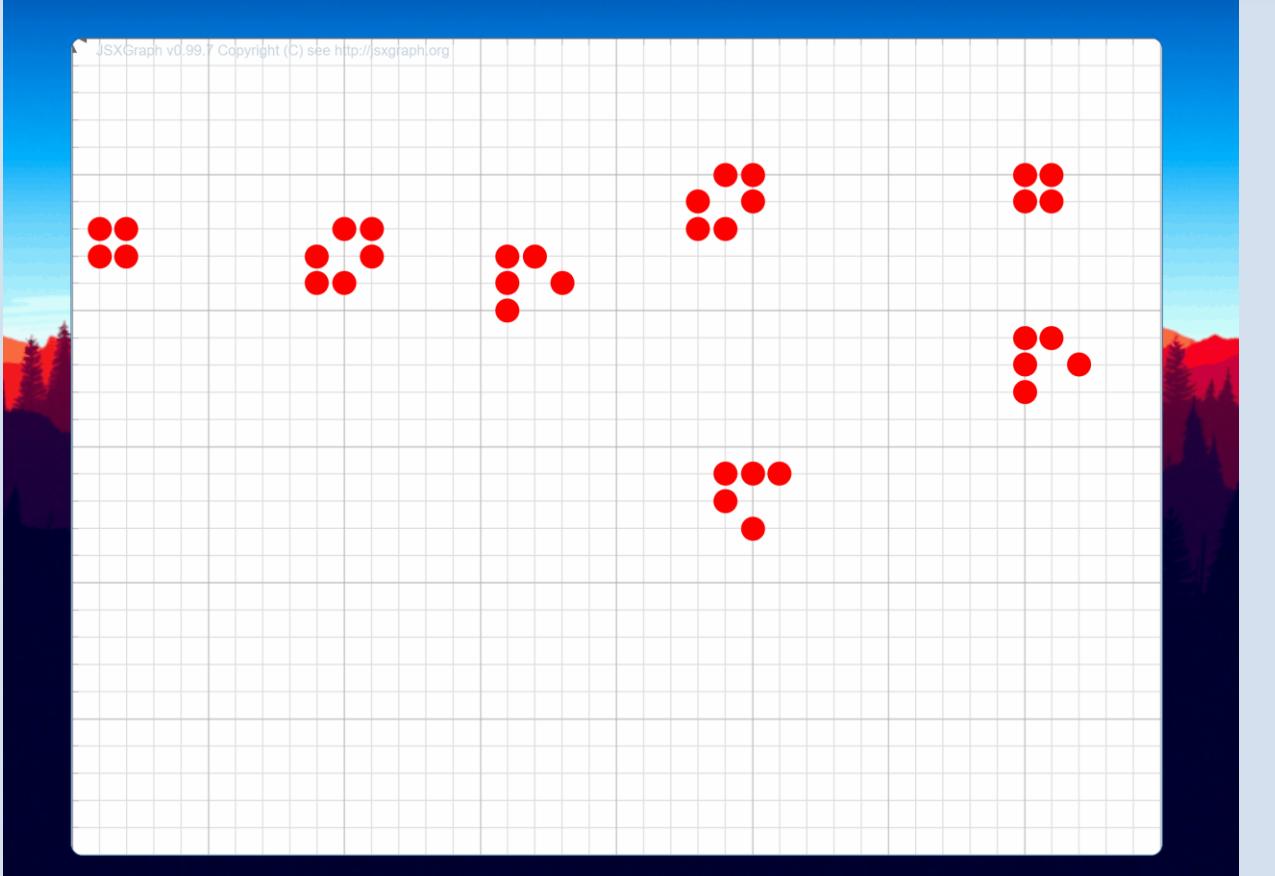
INTEGRATE
GAME OF LIFE
LEXICON

OPEN SOURCE

ANYWAY

COOL~

RESULT: <https://playgameoflife.live>

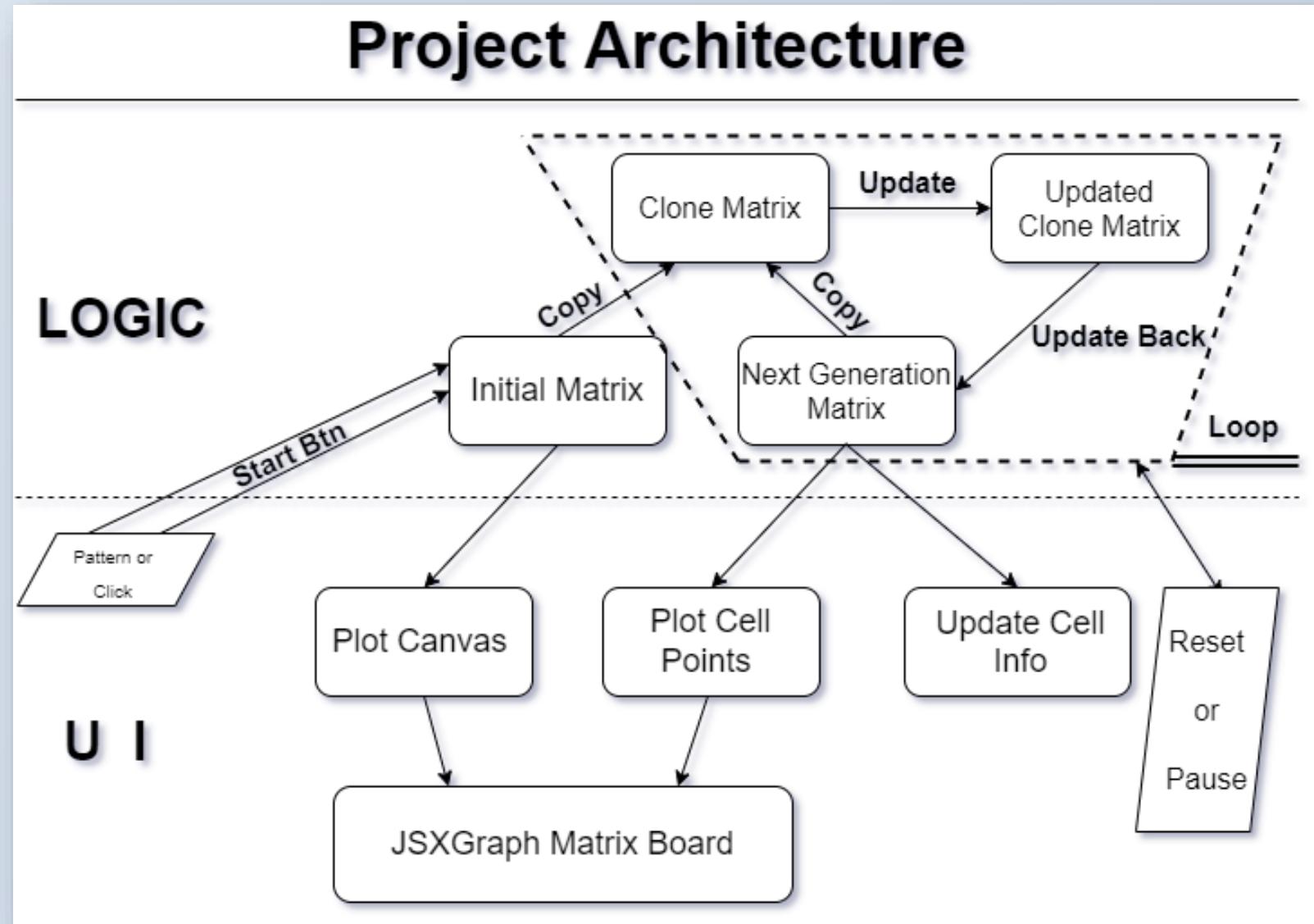


← ANIMATION
ILLUSTRATION

[GITHUB](#)
[README](#)

[YOUTUBE](#)
[VIDEO](#)

TECHNICAL PART – HOW I DEVELOP IT



TECHNICAL PART – HOW I DEVELOP IT

```
Game of Life > public > js > JS gameofLife.js >  nextGeneration

103
104  var board = JXG.JSXGraph.initBoard("box", {
105    boundingbox: [0, 0, -40, -30],
106    keepaspectratio: true,
107    axis: true,
108    grid: true,
109    showCopyright: true,
110    shownavigation: false,
111    pan: {
112      //panning interaction(i.e.moving the origin)
113      enabled: false, // disallow panning
114      needTwoFingers: false, // panning could not be done with two fingers on touch devices
115      needShift: false, // mouse panning needs pressing of the shift key
116    },
117    zoom: {
118      factorX: 1, // horizontal zoom factor (multiplied to JXG.Board#zoomX)
119      factorY: 1, // vertical zoom factor (multiplied to JXG.Board#zoomY)
120      wheel: false, // allow zooming by mouse wheel or
121      // by pinch-to-zoom gesture on touch devices
122      needShift: true, // mouse wheel zooming needs pressing of the shift key
123      min: 1, // minimal values of JXG.Board#zoomX and JXG.Board#zoomY, Limits zoomOut
124      max: 1, // maximal values of JXG.Board#zoomX and JXG.Board#zoomY, Limits zoomIn
125      pinchHorizontal: false, // Allow pinch-to-zoom to zoom only horizontal axis
126      pinchVertical: false, // Allow pinch-to-zoom to zoom only vertical axis
127      pinchSensitivity: 0, // Sensitivity (in degrees) for recognizing horizontal or vertical pinch-to-zoom gestures.
128    },
129  });
130
```

TECHNICAL PART – HOW I DEVELOP IT

```
Game of Life > public > js > JS gameofLife.js > nextGeneration

375
376     //Update back the state of next generation cell from clone matrix to original matrix, and plot
377     board.suspendUpdate();
378     for (i = 0; i < matrixRow; i++) {
379         for (j = 0; j < matrixColumn; j++) {
380             matrix[i][j] = copyMatrix[i][j];
381             if (matrix[i][j] == 1) {
382                 if (plotMatrix[i][j] != "") {
383                     board.removeObject(plotMatrix[i][j]);
384                 }
385                 plotMatrix[i][j] = board.create("point", [-j, -i], {
386                     size: cellSize,
387                     name: "",
388                     fixed: true,
389                 });
390             } else {
391                 board.removeObject(plotMatrix[i][j]);
392                 plotMatrix[i][j] = "";
393             }
394         }
395     }
396     board.unsuspendUpdate();
397 
```

TECHNICAL PART – HOW I DEVELOP IT

FRONTEND

BACKEND

<%= EJS %>

Bootstrap

jQuery
write less, do more.

JSXGraph

node.js®

Express JS

HEROKU

mongoDB.[®]
Atlas

GREAT THANKS FOR HELP FROM MR. ALFRED WASSERMANN

 stackoverflow

How to delete the created point when using JSXGraph?

Asked 1 year, 2 months ago Active 1 year, 2 months ago Viewed 225 times

0 upvotes

JSXGraph elements are removed by calling `board removeObject(object);` or `board removeObject([array of objects]);`. Your example would look like:

```
var p = board.create('point', [-3,1]);
var q = board.create('point', [-3,1], {face:'x', size:16});
board.removeObject(p);
board.removeObject(q);
// or
board.removeObject([p, q]);
```

share edit follow

answered Jun 16 '19 at 13:59

 Alfred Wassermann
1,358 ● 1 ● 7 ● 8

[add a comment](#)

FINALLY, IN MEMORY OF JOHN CONWAY

 **The Mathematical Association** @Mathematical_A · Apr 12
We're devastated to hear of the death of one of our Honorary Members, John Horton Conway. Here's a nice profile from The Guardian from 2015. theguardian.com/science/2015/j...



15 286 317

 **Leslie Wong** @LeslieWongH1 · Apr 13
Just implemented an interesting website project for Game of Life not long ago. It is also devastated of me to hear the death of John Conway. 😢😢😢
lesliewong.cn/gameoflife/

Thanks for devising such a wonderful cell automation world
(• - •)