Minotaur's Paradise

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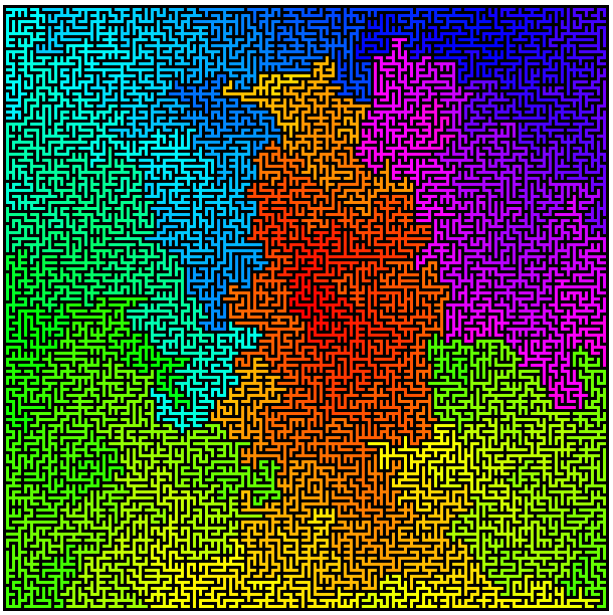
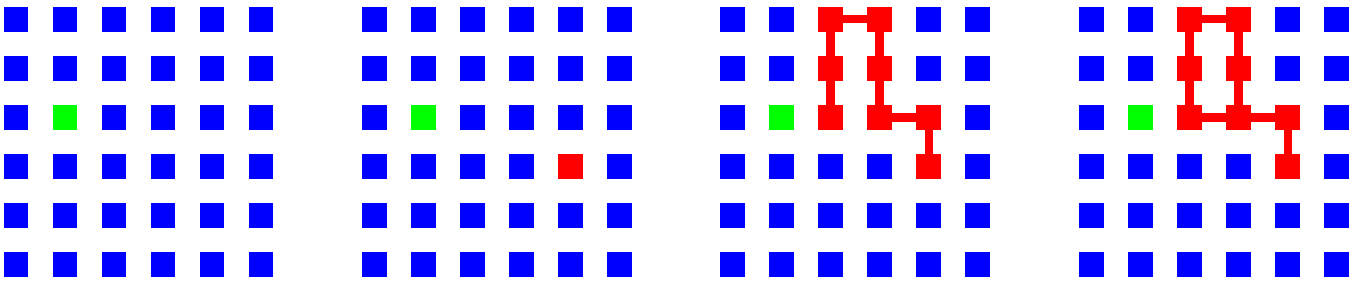


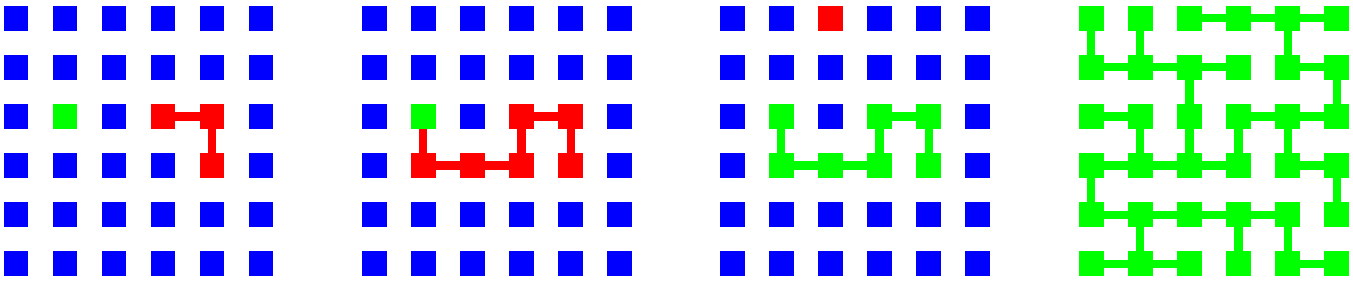
Ever wanted to make your own maze? If you've tried, you might find it's not as easy as you might think. Draw just one long path, and it's too easy; draw lots of small ones and you'll often run into the same problem. If even a small maze is tricky to make, a massive one seems downright impossible — and yet pick up any puzzle book for children and you'll see pages upon pages of them. How do they do it?

Enter Wilson's Algorithm. It's a method that makes maze-making as easy as following a recipe, and what's more, it produces a truly random one — every single possible maze of a fixed size has the same chance of being drawn.

It's not too hard to describe the algorithm. Draw a grid of blue dots and pick a random one to color green. Now pick another random blue dot and color it red. From this red dot, take a single step in a random direction and color that dot red too, drawing a line between the two dots. Now take a single step from that dot, draw another line, and so on. You'll end up with a red path drawing a squiggle across the grid. There are two things that you need to watch out for: first, if you try to color a red dot red, like a failed game of snake, instead backtrack along your red path until you're at the red dot that you were trying to color red again. As you backtrack, turn every red dot you pass back to blue, erase all the lines you pass over, and then start again from the new end of the path.

The other thing to watch out for is hitting a green dot. When you do, turn every red dot and line you've drawn to green, and then pick a new random blue dot and start again. Here's what a few steps might look like for a 6×6 maze:





You can watch the algorithm in action here. This applet uses slightly different colors — black instead of blue and white instead of red and green — and doesn't show the times it has to backtrack so that it doesn't take an incredibly long time to complete. Once the maze is drawn, it colors every point based on the shortest path to the center — red for the short paths and magenta for the longest.