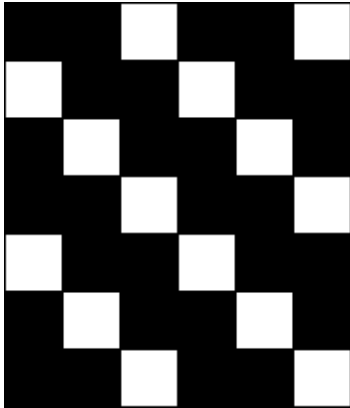
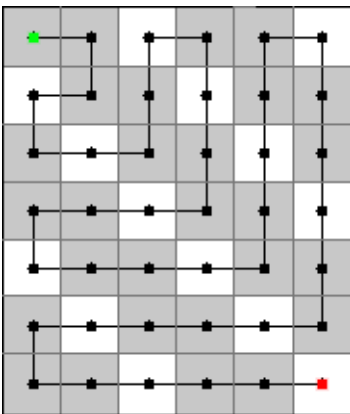


Pattern Tours, Part 1: Basic Concepts

The patterns considered here are black and white and represented by a rectangular grid of cells. Here is a typical pattern:



A sequence of cell locations is called a *path*. A path that includes every cell of a grid exactly once is called a *tour*. The focus here is on tours. Here is an example of a tour on the pattern shown above:



The green dot indicates the start of the tour and the red dot, the end.

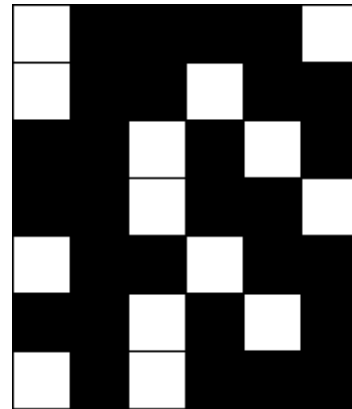
The sequence of colors of the cells along a tour is called a *band*. Here is the band for the example above:



A tour and the corresponding band completely characterize a pattern in the sense that the tour and band can be used to construct the pattern.

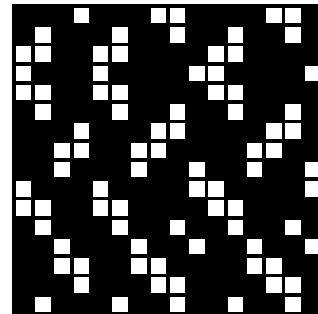
The process of producing a band from a pattern and a tour on it is called *reading out* the band. Conversely, given a blank grid, a tour, and a band, a pattern can be constructed by *reading in* the band. A band read out according to one tour and written in according to a different tour generally produces a different pattern. For example, here is the pattern

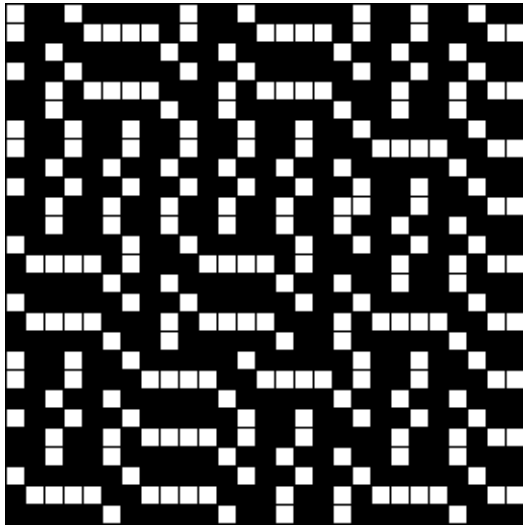
that results from reading in the band show previously with the tour in reverse order:



Tours and bands can be constructed independently of any pattern. This allows the possibility of constructing interesting and perhaps unexpected patterns.

Here are three patterns produce by tours and bands created mathematically but independently.





These are just some results from the first experiments. They are by no means the most interesting patterns that can be created by the methods described here.

Subsequent articles will explore the subjects of tours and bands in some depth and then go on to show how they can be used to produce interesting patterns.

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