

# Life Beyond Binary

Will Kirkby

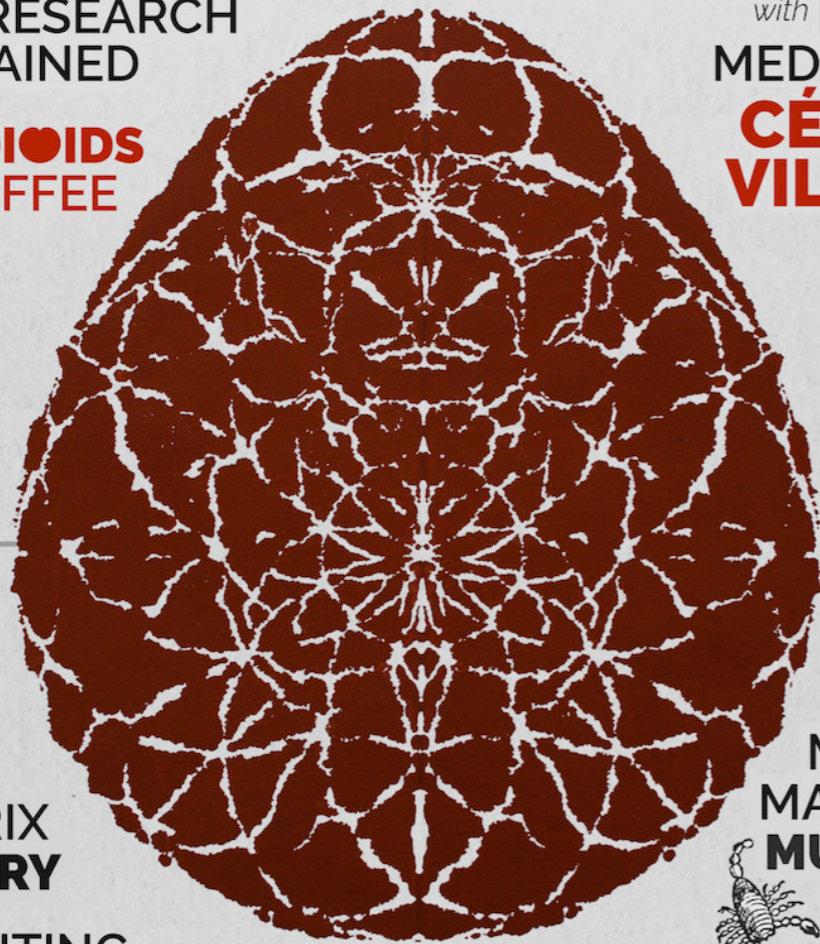
 @willkirkby

# chalkdust

A magazine for the mathematically curious ISSUE 06 // AUTUMN 2017

**MIRZAKHANI:**  
HER RESEARCH  
EXPLAINED

**CARDIOIDS**  
IN COFFEE  
CUPS



**BREAKFAST**  
*with* FIELDS  
MEDALLIST  
**CÉDRIC  
VILLANI**

**MATRIX  
POETRY**

COUNTING  
ON **THREE FINGERS**  
10100011101111

**MATHS,  
MALARIA,  
MURDER**



**+ COMIC**

**+ CROSSNUMBER**

**+ MARCUS DU SAUTOY**

**+ TOP TEN GEOMETRY INSTRUMENTS**

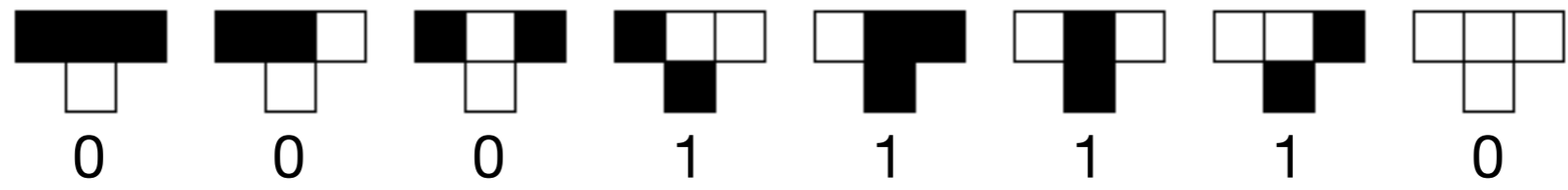
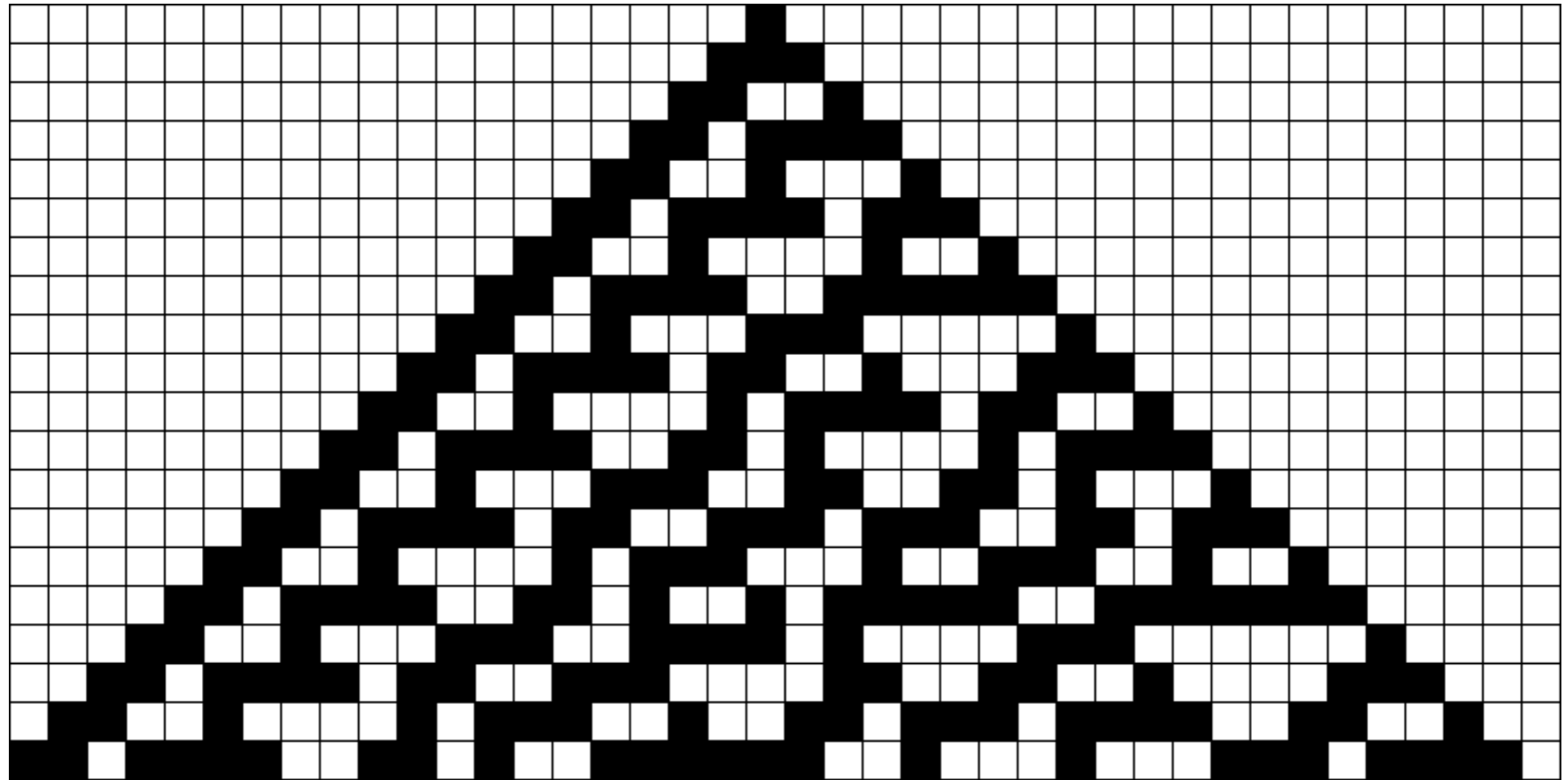
Write for us!

Deadline for issue 07  
2 January 2018

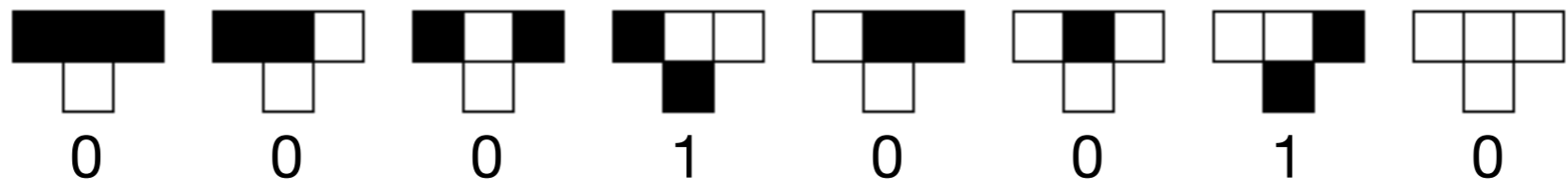
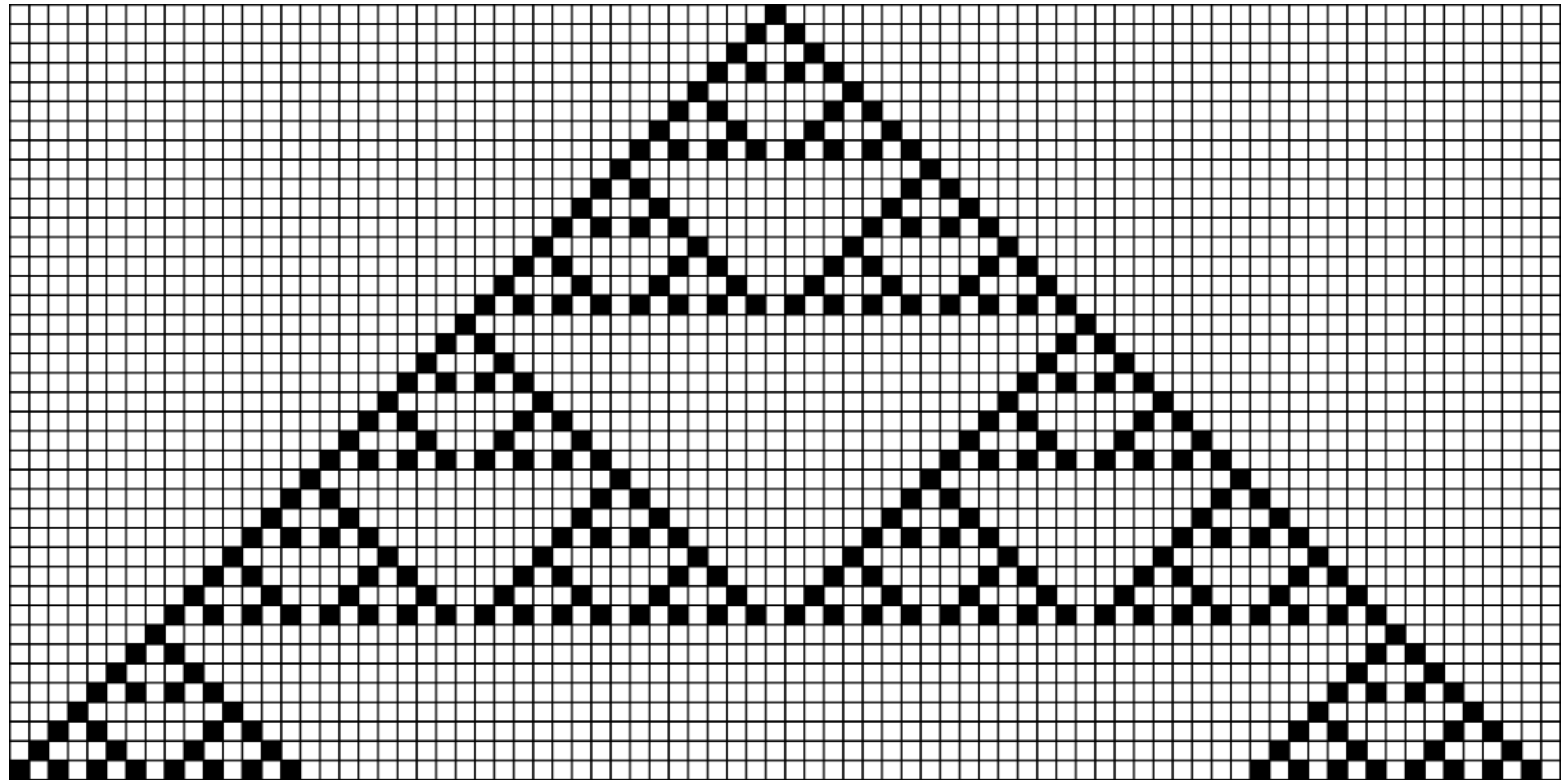
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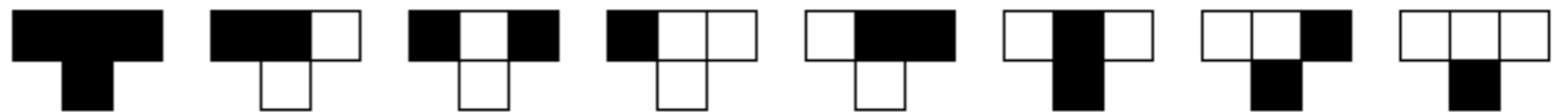
Rule 30



Rule 18

Cambridge North Train Station

Rule 135



6167 025

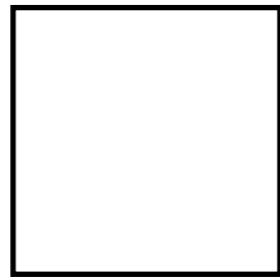
# You ain't seen nothing yet

# Bachman-Turner

# Overdrive Free wheelin'



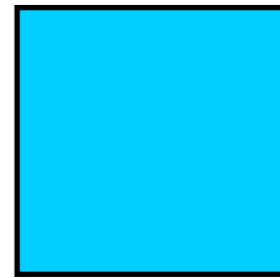
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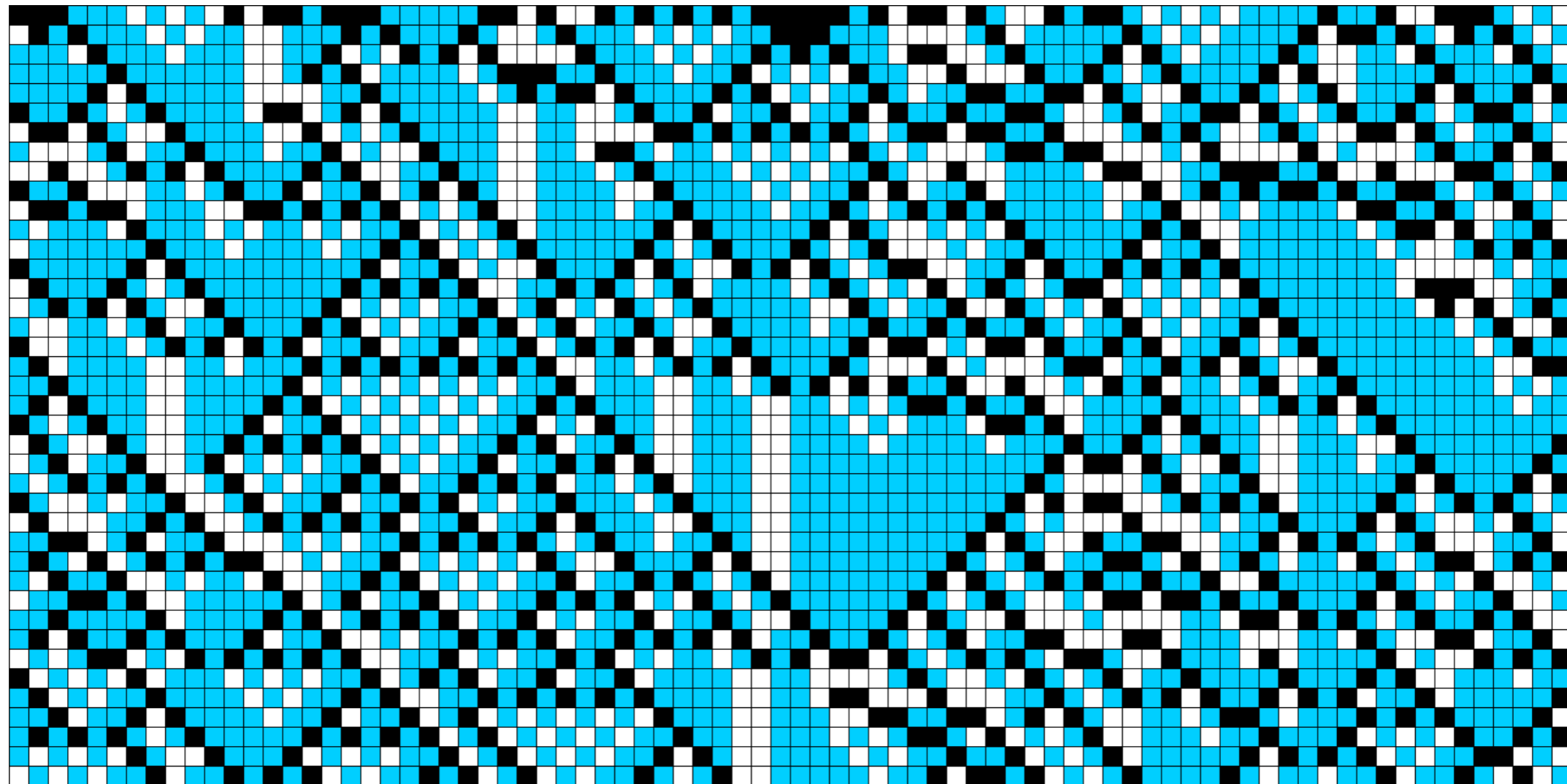


1



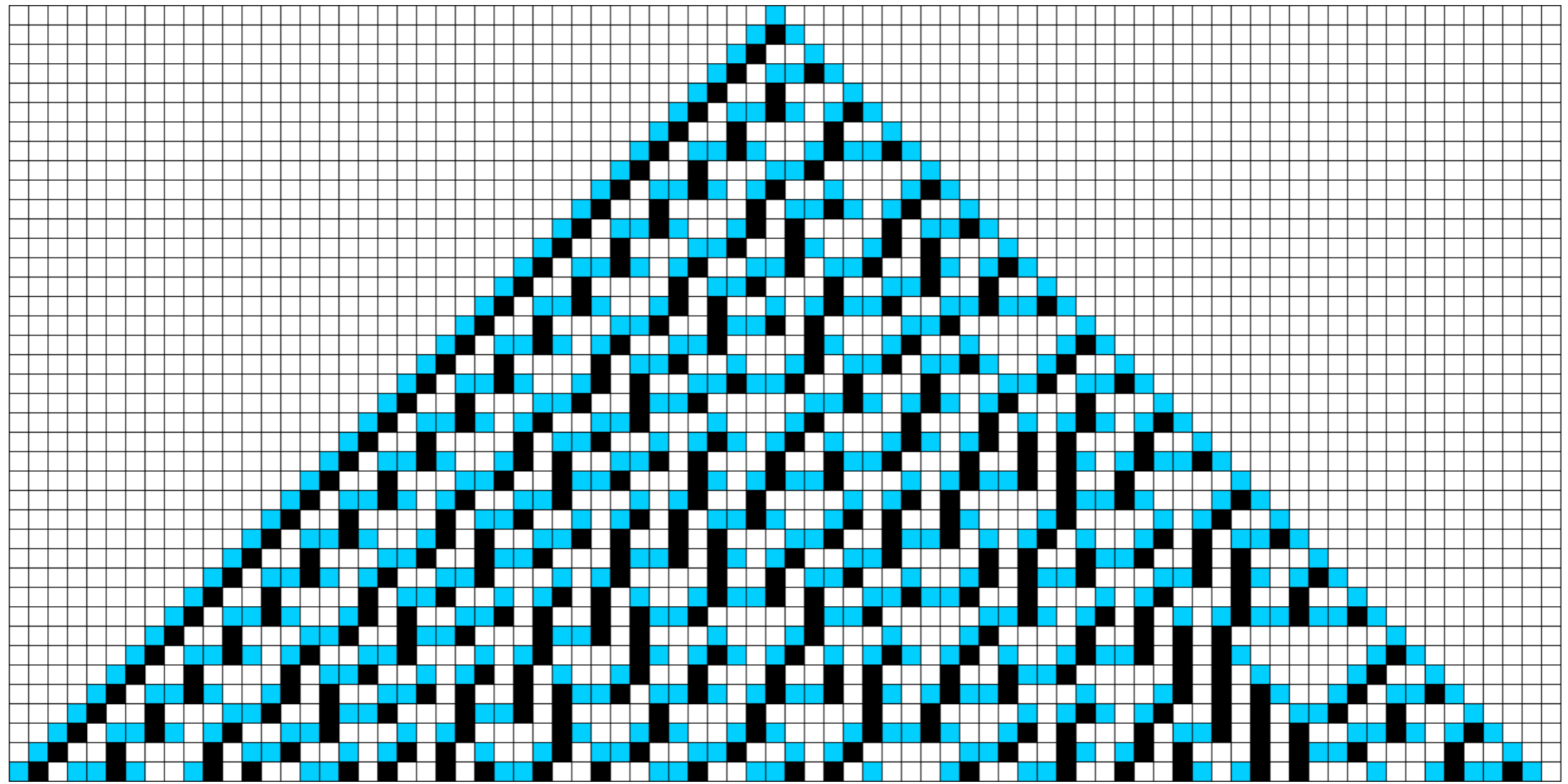
2

Ternary!



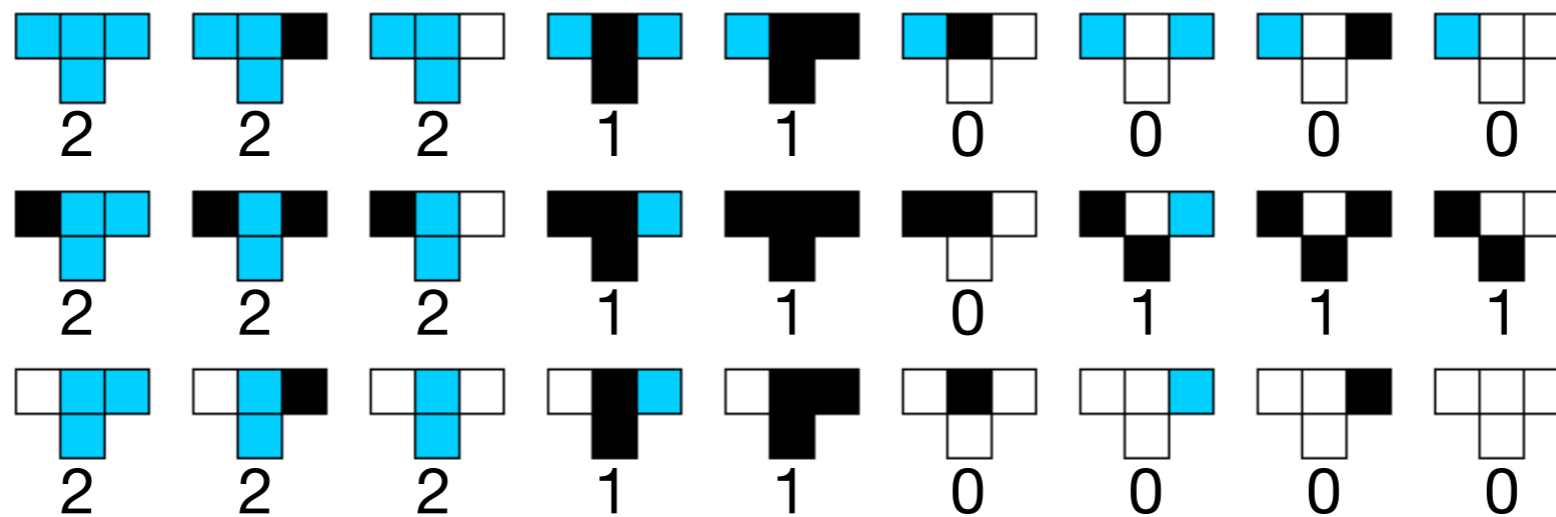
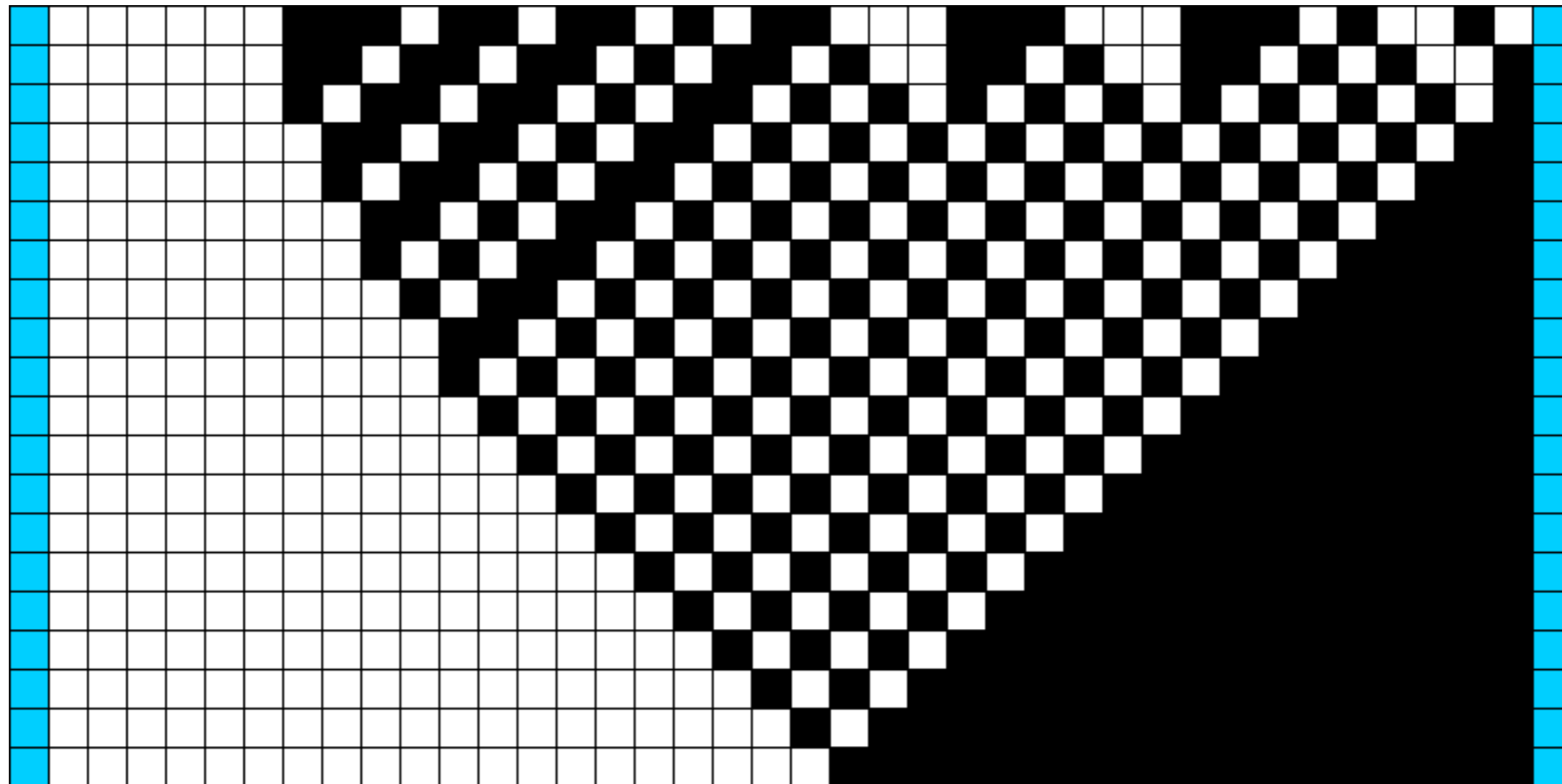
2	1	2	0	2	2	2	2	0
1	2	1	2	1	0	1	0	1
2	0	0	2	0	2	0	2	1

Rule 6,589,101,209,695



0	0	0	0	0	0	0	0	2
0	0	0	0	0	0	0	0	2
1	1	1	1	1	1	2	2	0

Rule 774,890,196



Rule 7,469,071,910,973

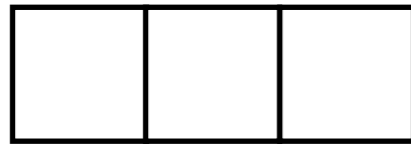
Can such a sorting algorithm  
be created for 3 states,  
in a base 4 automaton?

How about  $N$  states in base  $N+1$ ?

This is not a *Proof By MathsJam*<sup>TM</sup> - I genuinely have no idea!



$P(\textit{alive})$



$\frac{1}{4}$



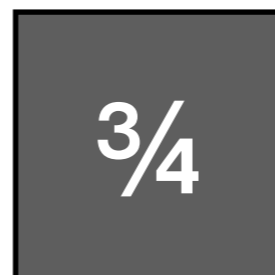
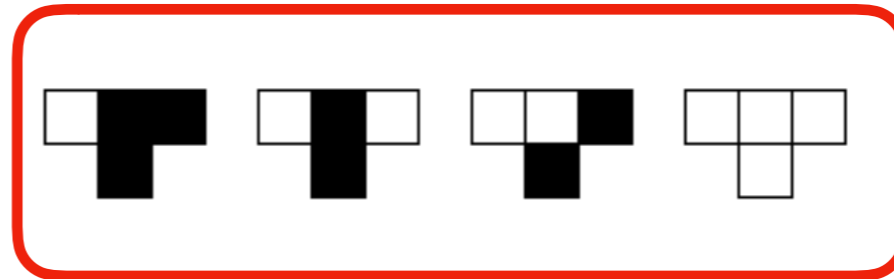
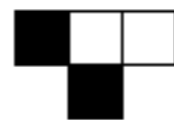
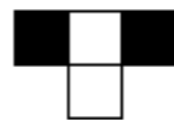
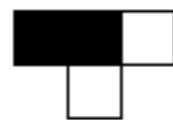
$\frac{1}{4}$

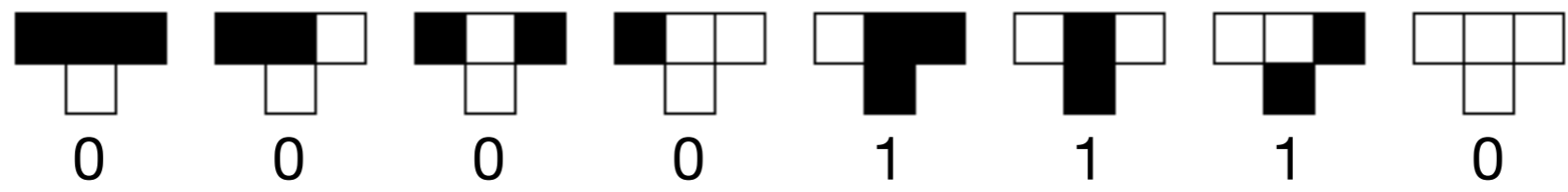
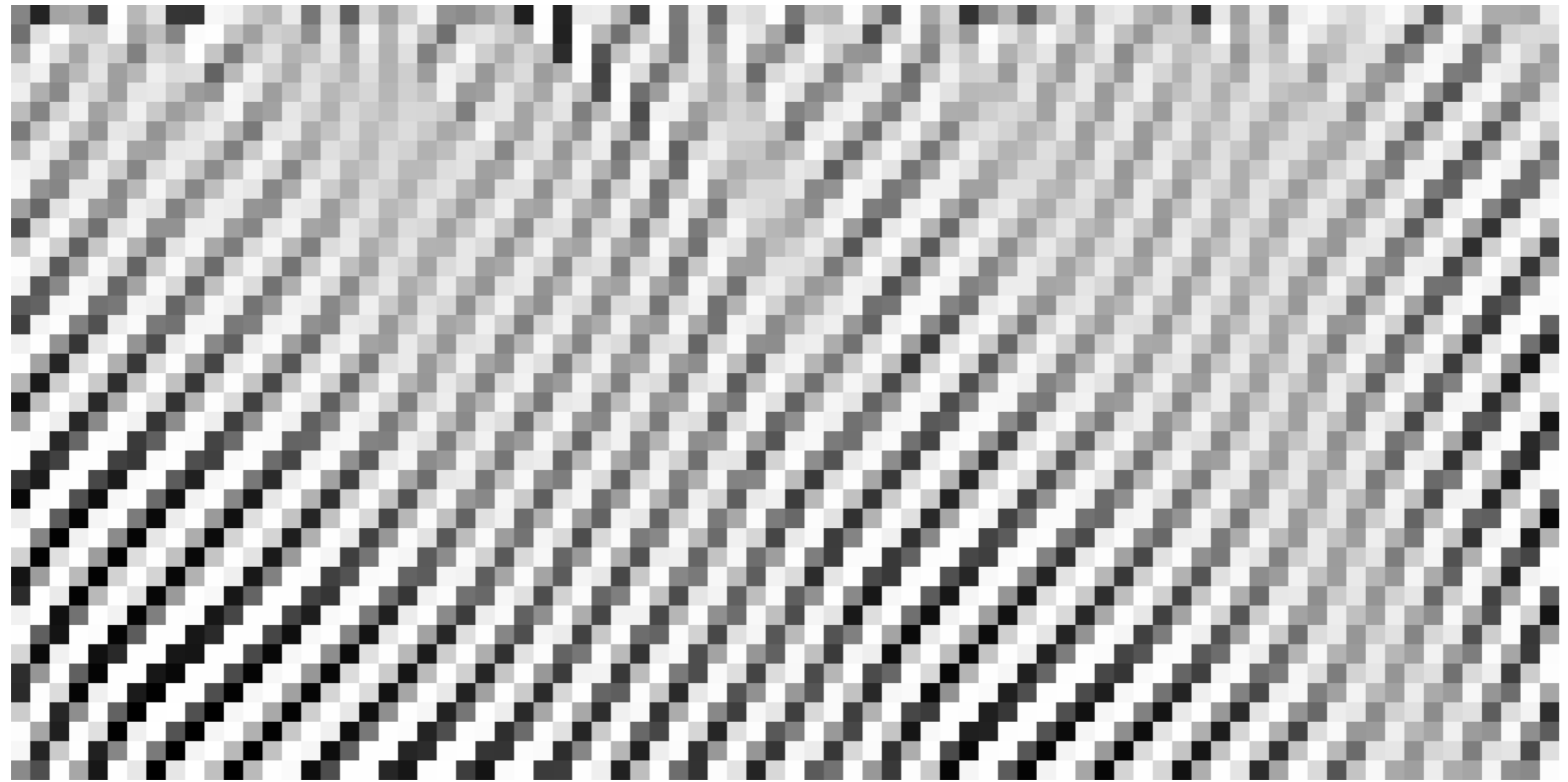


$\frac{1}{4}$

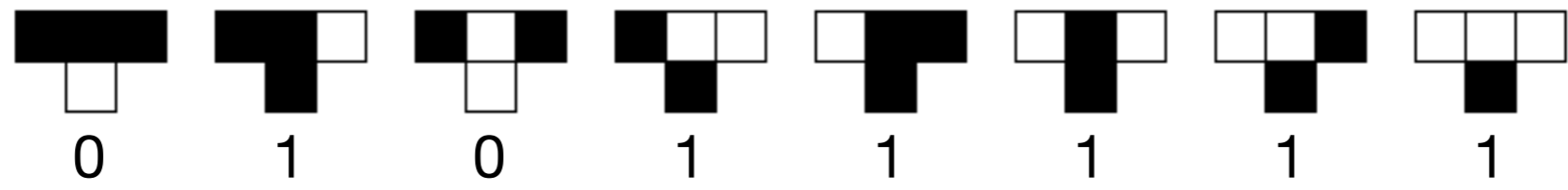
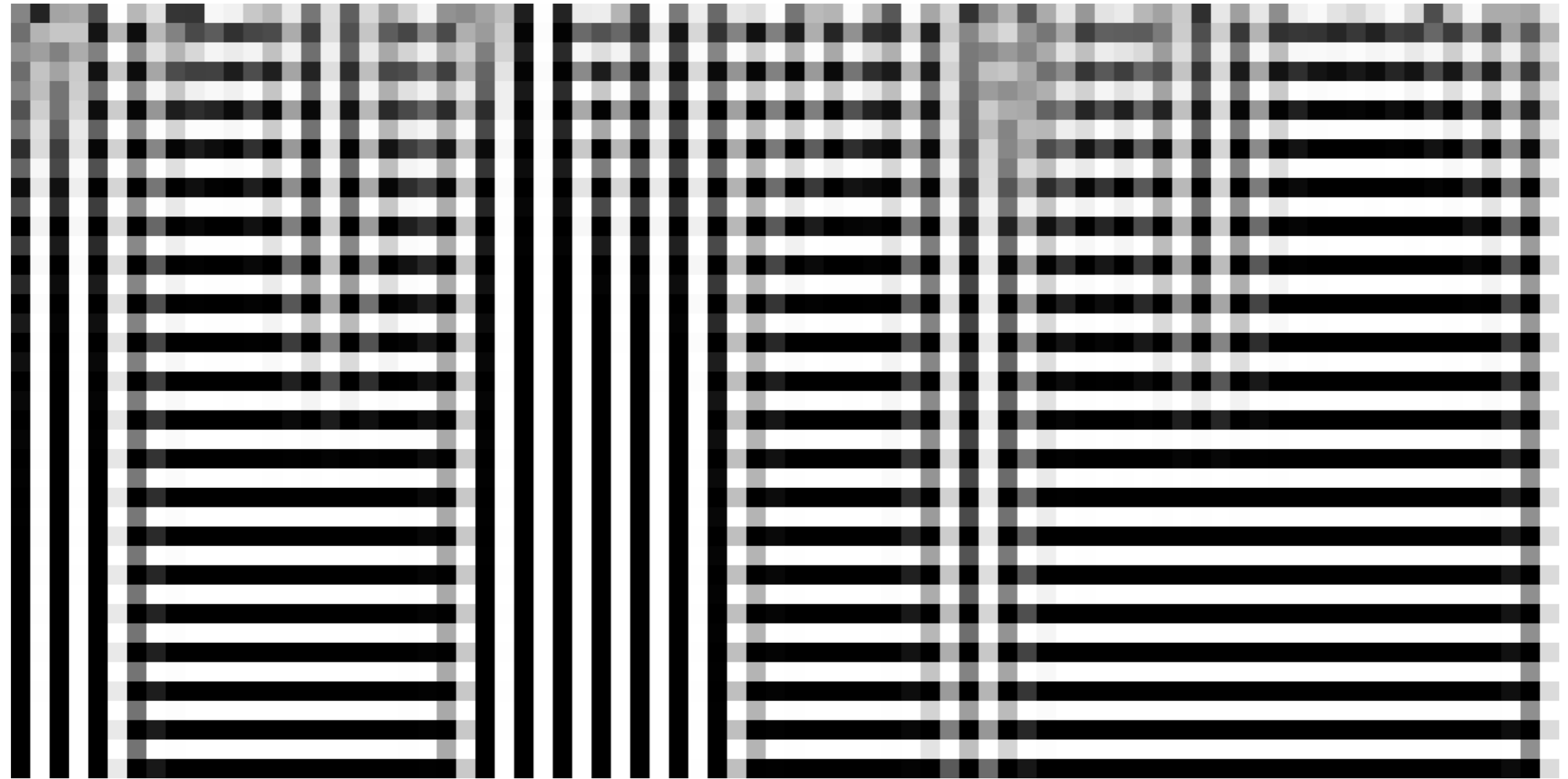


$\frac{1}{4}$

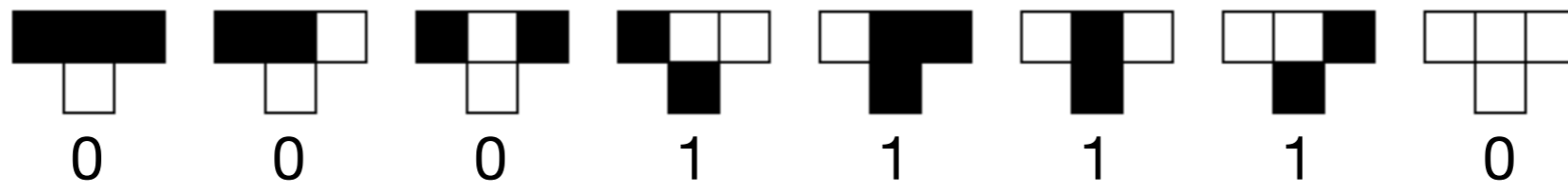




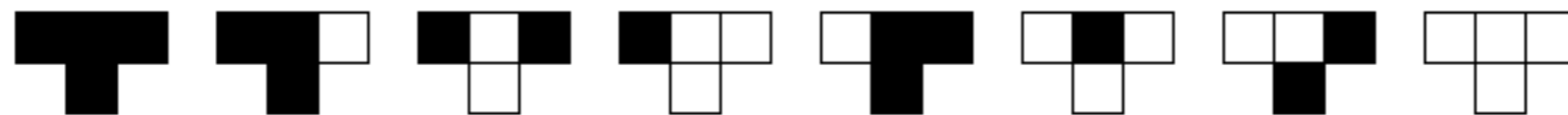
Rule 14



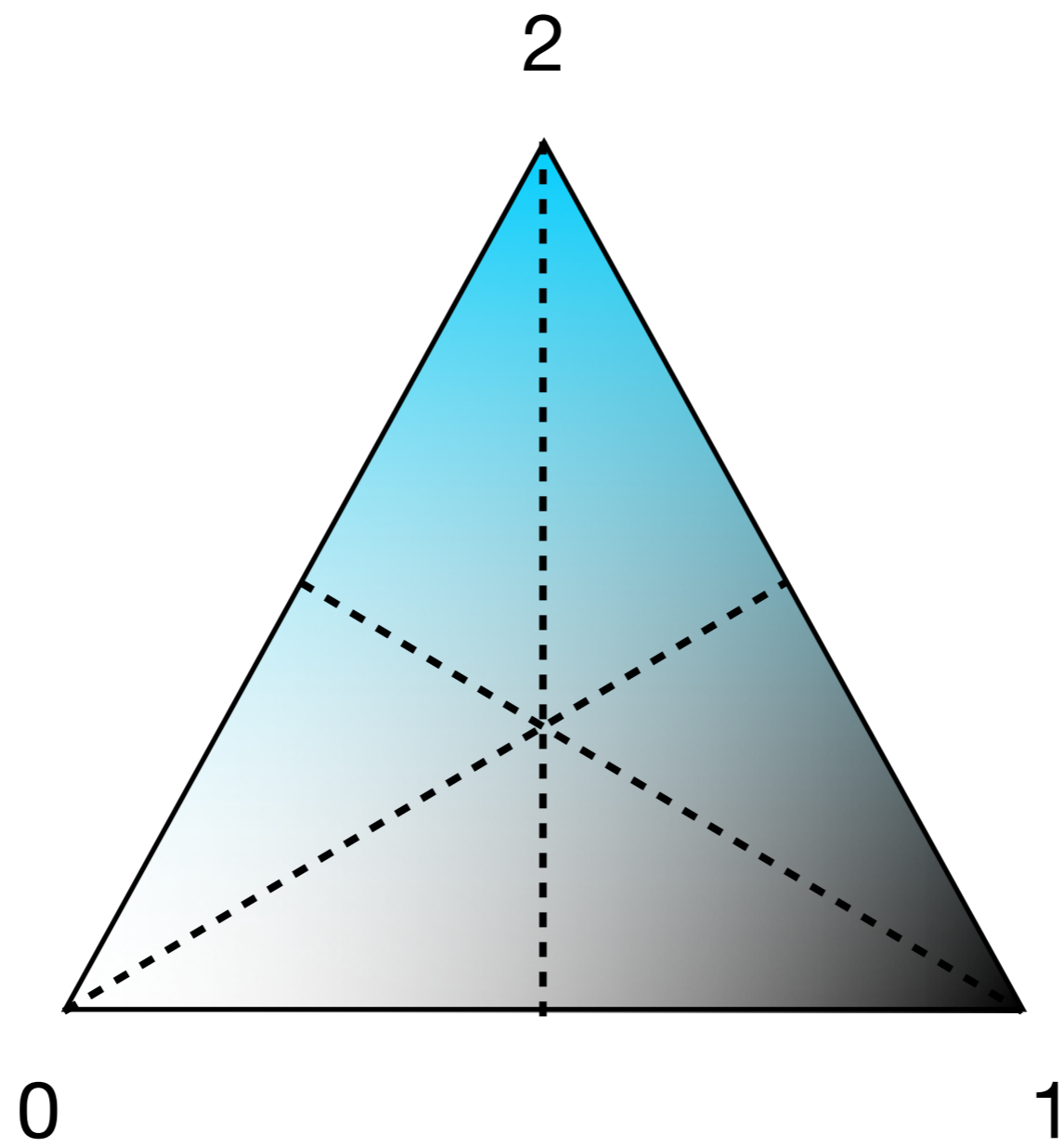
Rule 95

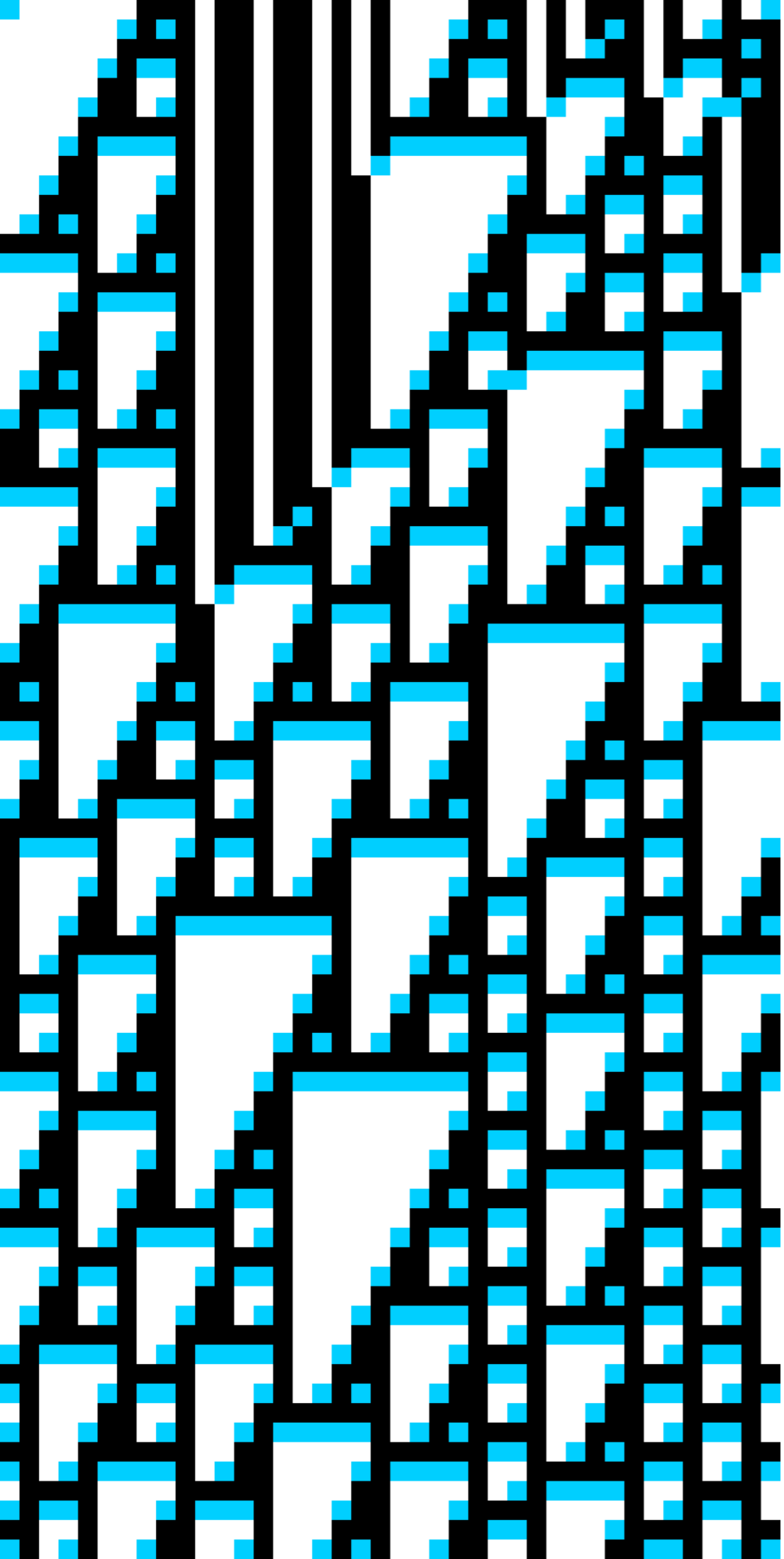


Rule 30



Rule 202





Thanks for  
your time!

Will Kirkby

 @willkirkby