Surjective Cellular Automata of neighborhood size at most 6

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Abstract

We enumerated all surjective cellular automata with neighborhood size at most 6 (radius at most 2.5)

Contents

As many surjective cellular automata are right or left permutive, we excluded these automata from the files.

The result are as follows:

- There are no surjective CA that is not permutive in neighborhood size 1,2,3
- There are 64 surjective CA that are not permutive in neighborhood size 4
- There are 11580 surjective CA that are not permutive in neighborhood size 5 (radius 2)
- There are 69926516 surjective CA that are not permutive in neighborhood size 6

Due to the way HAL works, it is not possible to put a binary file directly. To obtain the result, you should therefore

- Apply the command `base64 -d data.txt > data.tar.xz` to obtain a `tar.xz` file from the txt file. If you are on a Windows machine, the command is `certutil -decode data.txt data.tar.xz`
- Decompress the resulting file. Warning: The result is 600Mb long.

Contents can be extracted from the given files by the following command: `python ca.py N x` where `python` is Python2 (the program is not compatible with Python3), `N` is the neighborhood size, and `x` is the number of the automaton to display.