



The Snake Cube is

a mechanical puzzle, a chain of 27 or 64 cubelets, connected by an elastic band running through them. The cubelets can rotate freely. The aim of the puzzle is to arrange the chain in such a way that they will form $3 \times 3 \times 3$ or $4 \times 4 \times 4$ cube.

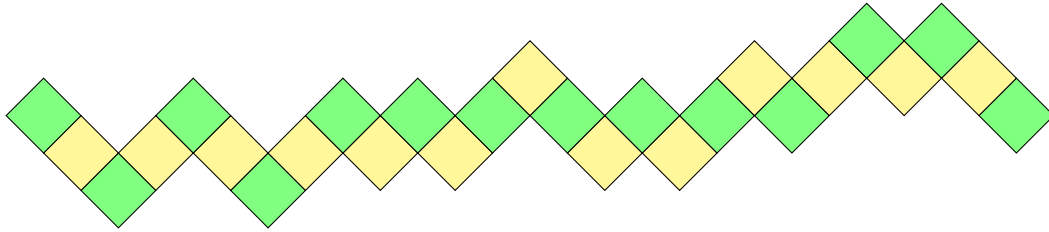


Figure 1: The most common instance of the Snake Cube.

Question. How many chains exists for an $n \times n \times n$ cube?

Related.

1. How about for an $n \times m \times p$ rectangular prism?
2. Can the “hardest” puzzles be quantified? Perhaps those with the greatest or fewest number of solutions?
3. Can this be generalized to higher dimensions?
4. Can this be generalized to other polytopes?

References.

Problem 48.

Problem 101.

https://en.wikipedia.org/wiki/Snake_cube

<https://github.com/scholtes/snek> (Counts solutions to Rubik’s Snake)