



The diagram illustrates a hierarchical tree structure representing a sequence of splits in a four-letter code (A, B, C, D). The root is a cluster of A, B, C, and D. It splits into two branches: one with B, C, and D, and another with A and a dashed circle. The B, C, D branch splits into B and D, and C and D. The A and dashed circle branch splits into A, C, and D, and A, B, and D. The A, C, and D branch splits into A, C, and D, and A, B, and D. The A, B, and D branch splits into A, B, and D, and A, C, and D. The final state is a cluster of A, B, C, and D.

**Question.** In general, given  $n$  coins starting in a “spiral” configuration, how many polyhexes can be reached by the above procedure?

1. What if this is done with hyperspheres in  $\mathbb{R}^d$ ?
2. Is there a sensible way to categorize non-connected configurations?
3. Which polyhexes require the greatest amount of moves?

[https://en.wikipedia.org/wiki/Polyhex\\_\(mathematics\)](https://en.wikipedia.org/wiki/Polyhex_(mathematics))  
[https://www.youtube.com/watch?v=\\_pP\\_C7HEy3g](https://www.youtube.com/watch?v=_pP_C7HEy3g)  
 Martin Gardner, SciAm, Feb 1966