Steven Miller poses a riddle:

> A square has a quarter in each corner. You are blindfolded and must get all quarters to be heads up or all to be tails up. You will be told when you have done this. You may flip however many you want, then ask if you are done (this constitutes a turn). The square is then rotated/spun an undisclosed number of times. You then get another turn and so on
> Is there a strategy that is guaranteed to work in a finite number of moves, and if so, what is that smallest number of moves you need to be 100% you'll be able to have all heads up or all tails up?

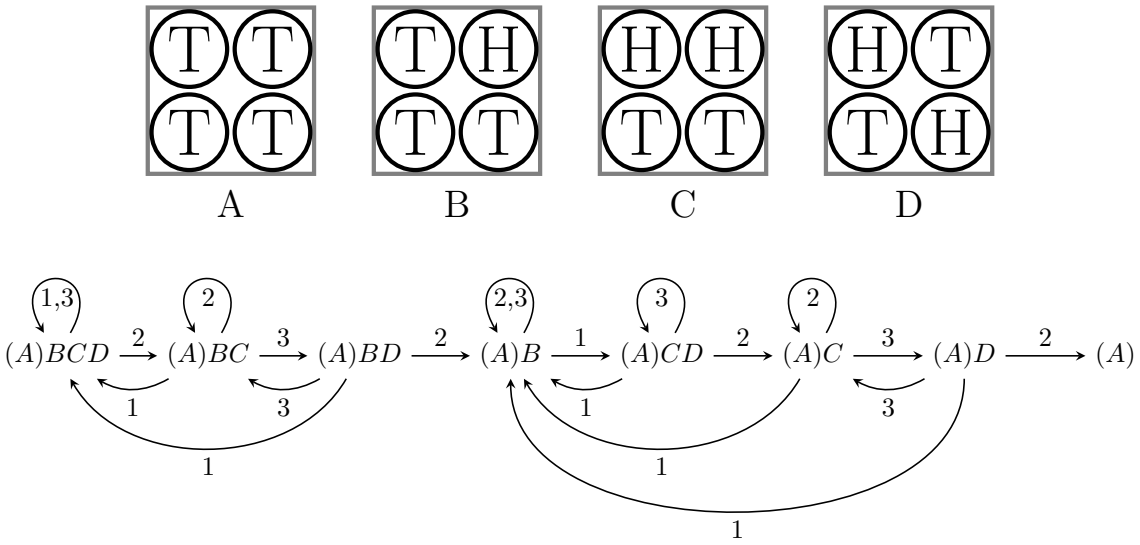

Figure 1: A equilateral triangle made of 3-trapezoids.

Question. If the three moves are (1) flipping a corner, (2) flipping two opposite corners, or (3) flipping over two adjacent corners, then the graph shows that all heads or all tails can be guaranteed in a minimum of seven moves.

Related.

1. Can this be generalized to an arbitrary n-gon?
2. Can this be generalized to multiple dimensions (e.g. a tetrahedron)?
3. What if the coins need to end up all heads?
4. What if the coins have k sides that are changed randomly? Changed sequentially?
5. What if the operator scrambles (but does not flip) the coins after each move?
6. What if the operator tells you how many coins are up after a given move?

References.

`http://mathriddles.williams.edu/?p=77`