Starting with a row of n coins all heads up, repeatedly flip over a coin which is heads and its neighbor to the right. If the chosen coin is the rightmost coin, there is no neighbor to flip.

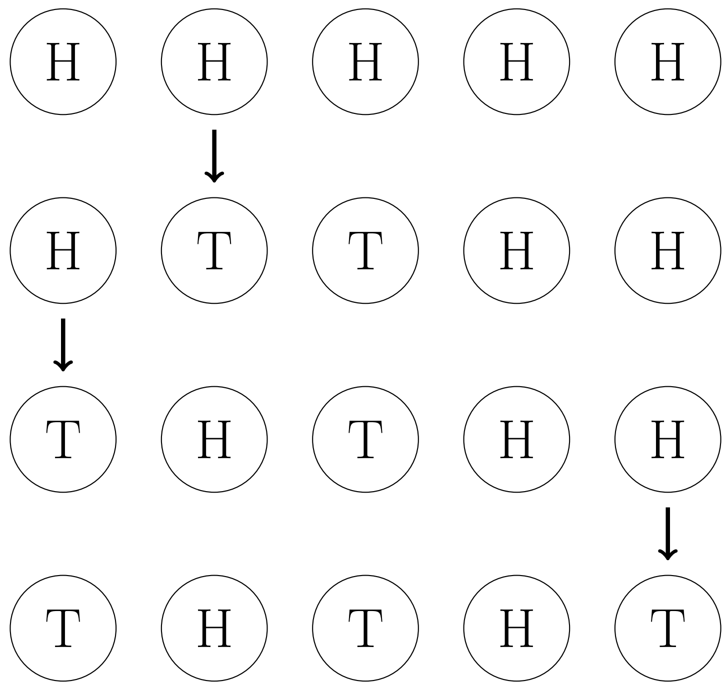

Figure 1: Since the sequence of coin flips strictly increases lexicographically (with $T > H$), the process must eventually halt.

Question. If the puzzle is modified so that when a coin is chosen, either the right or left neighbor is chosen (with probability p and $1 - p$ respectively), what is the optimum strategy for maximizing the total number of flips?

Related.

1. What is the strategy for minimizing the number of flips?
2. What is the expected number of total flips under optimal play?
3. What if the direction is randomly chosen, and then you choose which coin to flip? (i.e. you know the direction before you make your choice.)
4. What if the (infinite) sequence of choices have to all be made ahead of time?
5. What if this is done on a different geometry, such as a circle or grid?
6. What if one, neither, or both neighbors have some probability of being flipped?
7. What if coins have more than two states? (e.g dice instead of coins)
8. What if you can flip over a contiguous section of heads?

References.

Problem 79.