

For the arrangement below, is it possible to successively Flip pairs of adjacent coins so that all coins have heads Facing up?

(H) (T) (H) (H)

Let s be the number of tails showing. Currently $s=1$, we want to get to $s=0$. If we Flip two coins, we have the following cases:

- ① Both heads. Then s increases by 2
- ② Both tails. Then s decreases by 2
- ③ One head, one tail. Then s stays the same.

So s has started off as an odd number and after any change we make will remain odd. Therefore it is impossible to make $s=0$.

Generalisation: For the arrangement below, is it possible to flip over pairs of adjacent coins s.t. all coins have heads facing up?

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Initially, we have $s = 5$. Using the parity argument above, it is again impossible to achieve $s = 0$.