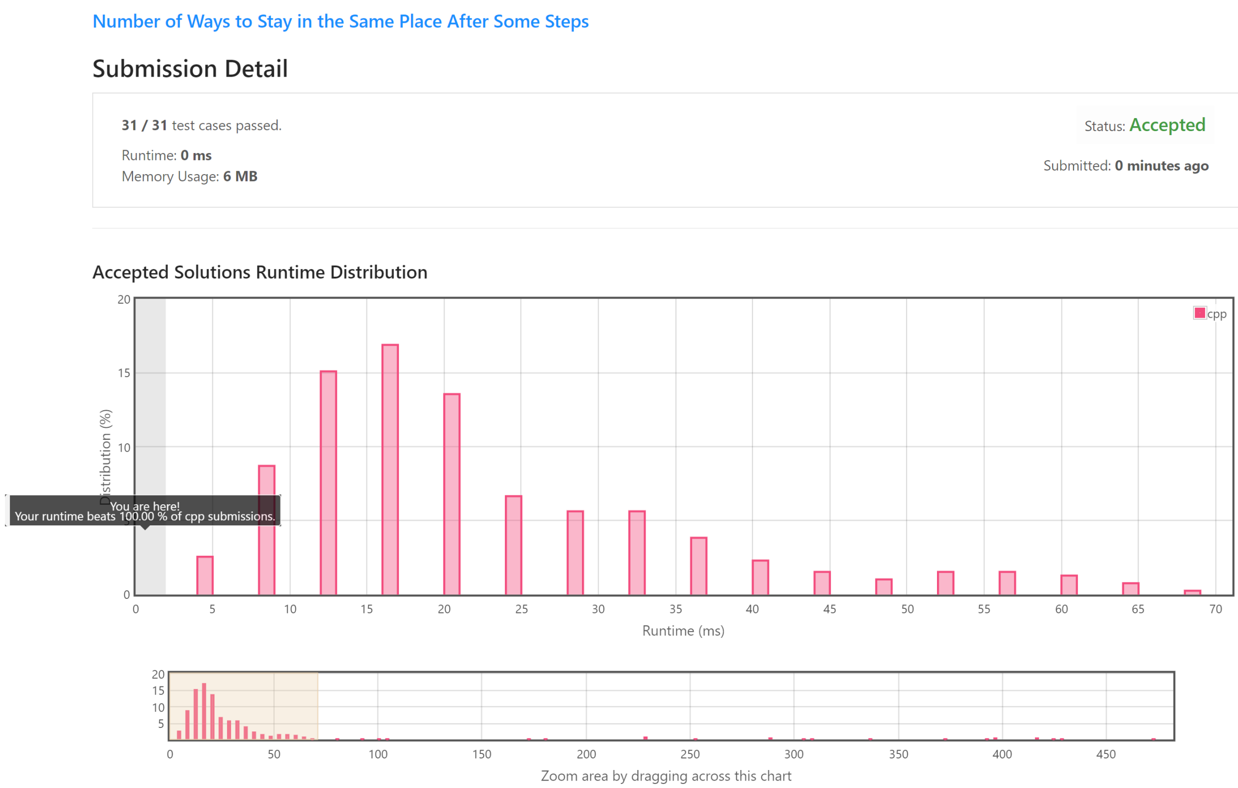
Let n denote the number of steps and let m denote the array length.
1. DP. $O(n \cdot \min(n, m))$.
2. If we cannot stay in the same place: DP, the answer is

$$\binom{n}{n/2} - \sum_{i \geq 1}\left(\binom{n}{n/2-(i-1)m-(2i-1)} - \binom{n}{n/2+im+2i}\right) - \sum_{i \geq 1}\left(\binom{n}{n/2+im+(2i-1)} - \binom{n}{n/2-im-2i}\right).$$

$O(n)$. https://www.zhihu.com/question/346654767/answer/1110765408
Now we can stay in the same place, and the answer is

$$\sum_{n' \leq n,\ n' \text{ even}} \binom{n}{n'}\left[\binom{n'}{n'/2} - \sum_{i \geq 1}\left(\binom{n'}{n'/2-(i-1)(m-1)-(2i-1)} - \binom{n'}{n'/2+i(m-1)+2i}\right)\right.$$
$$\left. - \sum_{i \geq 1}\left(\binom{n'}{n'/2+i(m-1)+(2i-1)} - \binom{n'}{n'/2-i(m-1)-2i}\right)\right].$$

We can compute the solution in $O(n \cdot \frac{n}{m})$ time, by preprocessing factorial mod p and its inverse, then each binomial can be computed in $O(1)$ time.
If $m \leq \sqrt{n}$, use the first algorithm, otherwise use the second algorithm. $O(n\sqrt{n})$.
3. Another way to derive: https://hyper-meta.blogspot.com/2023/10/the-long-journey-from-on2-to-on15.html.
4. $\tilde{O}(\sqrt{n})$ using polynomials or linear recursions. see my article https://zhuanlan.zhihu.com/p/344219746.



References