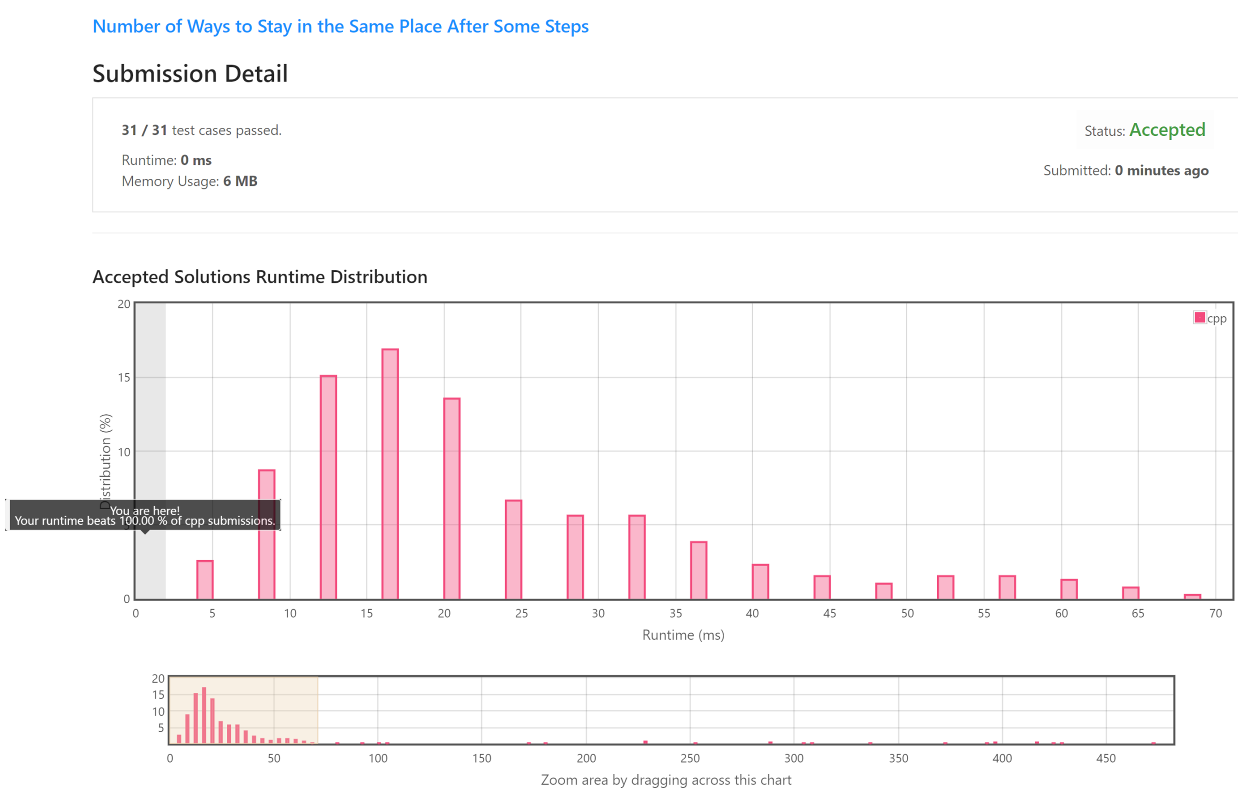
Let n denote the number of steps and let m denote the array length.
1. DP. $O(n \cdot \min(n, m))$.
2. If we cannot stay in the same place: DP, the answer is

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

$O(n)$. 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. $O(n\sqrt{n})$.



References