Problem 1259: Handshakes That Don't Cross

Problem Information

Difficulty: Hard
Acceptance Rate: 60.00%
Paid Only: Yes
Tags: Math, Dynamic Programming

Problem Description

You are given an **even** number of people `numPeople` that stand around a circle and each person shakes hands with someone else so that there are `numPeople / 2` handshakes total.

Return _the number of ways these handshakes could occur such that none of the handshakes cross_.

Since the answer could be very large, return it **modulo** `109 + 7`.

Example 1:

Input: numPeople = 4 **Output:** 2 **Explanation:** There are two ways to do it, the first way is [(1,2),(3,4)] and the second one is [(2,3),(4,1)].

Example 2:

Input: numPeople = 6 **Output:** 5

Constraints:

* `2 <= numPeople <= 1000` * `numPeople` is even.

Code Snippets

C++:

```
class Solution {
public:
int numberOfWays(int numPeople) {

}
};
```

Java:

```
class Solution {
public int numberOfWays(int numPeople) {

}
}
```

Python3:

```
class Solution:
def numberOfWays(self, numPeople: int) -> int:
```