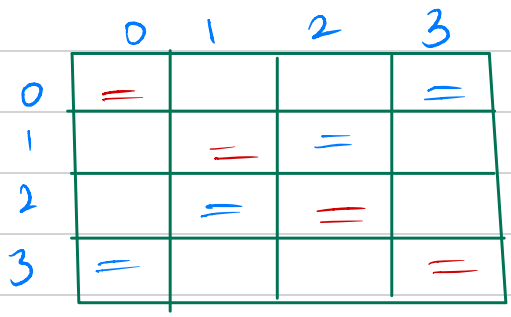
August 06, 2025

DOUBT SESSION

Ques 1. Matrix (2D-Arrays) https://maang.in/problems/Matrix-1144



Absolute diff. of 2 diagonals.
Output = |Red - Blue|

Brute Force : $O(N^2)$

```
for (i=0; i<4; i++)    Red += a[i][i]
for (i=0; i<4; i++)    Blue += a[i][n-i-1]
```
→ O(N)

- → Use of single loop
- → Compute Red, Blue
- → Output the absolute difference.

Ques 2. URL https://maang.in/problems/URL-1201

Given a string S that represents a **URL** request. Print five lines contains the following format: "X : Y" where X is the parameter and Y is the parameter's value.

Note: The parameters of the **URL: username, pwd, profile, role** and **key**.

Ex: use info after '?'

```
/service?username=test&pwd=test&profile=developer&role=ELITE&key=manager
```

username : test
pwd : test
profile : developer
role : ELITE
Key : manager

```
void solve()
{
    string s;
    cin >> s;
    int flag = 0;
    for (auto i : s)
    {
        if (i == '?') ← use info after '?'
        {
            flag = 1;
            continue;
        }
        if (flag == 1)
        {
            if (i == '&')cout << endl; ← keyword
            else if (i == '=')cout << ":";
            else cout << i; ← value
        }
    }
}
```

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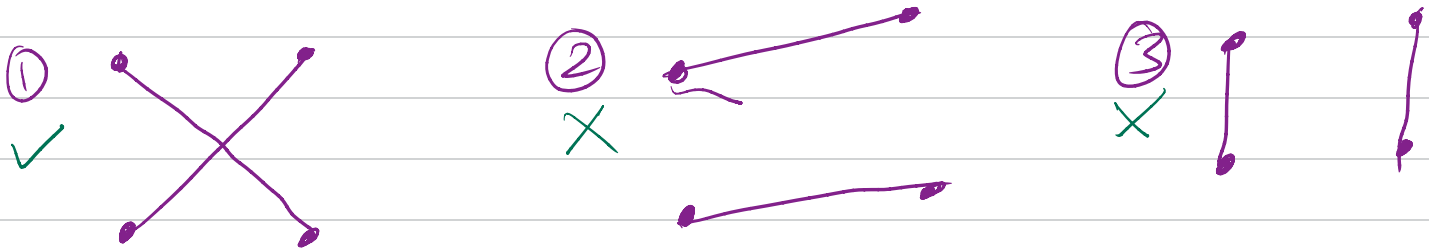
Ques 3. Number of Intersecting Diagonals

https://maang.in/problems/Number-of-Intersecting-Diagonals-69

Have to figure out 4 points for intersecting diagonals

How many way to choose these points

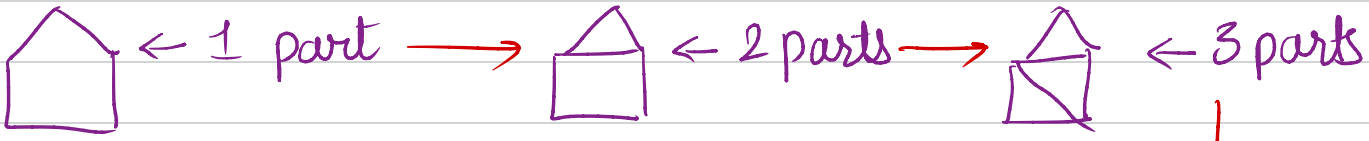


$^{N}C_4$ ways to choose but it is important to not only ① will contribute towards an intersection

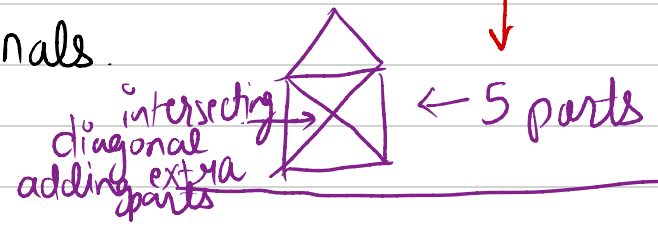
$\Rightarrow {}^{N}C_4 * 1$

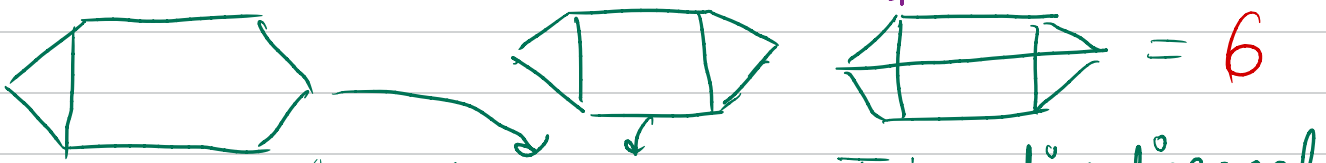
Ques 4. No. of parts in Convex Polygon

https://maang.in/problems/Number-of-Parts-in-Convex-Polygon-70



No. of parts = 1 + # of diagonals





Non intersecting = 1 + 1 + 1 = 3

Intersecting diagonal → intersects at 2 points

No. of parts = 1 + # of diagonals + # intersection in a diagonal

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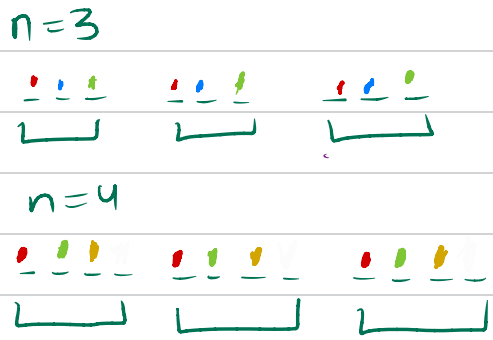
Ques 5. Konya & Tanya

https://codeforces.com/problemset/problem/584/B

Kolya loves putting gnomes at the circle table and giving them coins, and Tanya loves studying triplets of gnomes, sitting in the vertexes of an equilateral triangle.

More formally, there are $3n$ gnomes sitting in a circle. Each gnome can have from 1 to 3 coins. Let's number the places in the order they occur in the circle by numbers from 0 to $3n - 1$, let the gnome sitting on the i-th place have a_i coins. If there is an integer i $(0 \le i < n)$ such that $a_i + a_{i+n} + a_{i+2n} \neq 6$, then Tanya is satisfied.

Count the number of ways to choose a_i so that Tanya is satisfied. As there can be many ways of distributing coins, print the remainder of this number modulo $10^9 + 7$. Two ways, a and b, are considered distinct if there is index i $(0 \le i < 3n)$, such that $a_i \neq b_i$ (that is, some gnome got different number of coins in these two ways).



n=1 (1, 2, 3) any no can be picked from this

3 options 3 options 3

Total = 3^3

Times when the sum will result in 6 = 7 such triplets

Ans = $3^3 - 7$

= $3^{3(1)} - 7^{(1)}$

Generalising

$\Rightarrow 3^{3n} - 7^n$

Ques 6. Sum of Digit

http://maang.in/problems/Number-Sum-of-Digit-26

N = 20 , S = 3

	Diff		Diff
1 - 10	9 - 9 0	16 - 7	9
2 - 20	10 - 1 9	17 - 8	9
3 - 30	11 - 2 9	18 - 9	9
4 - 40	12 - 3 9	19 - 10	9
5 - 50	13 - 4 9	20 - 2	18
6 - 60	14 - 5 9		
7 - 70	15 - 6 9		
8 - 80			

>3

Value - Sum >= S