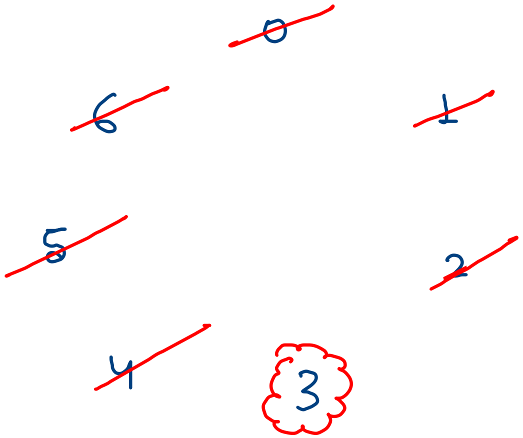
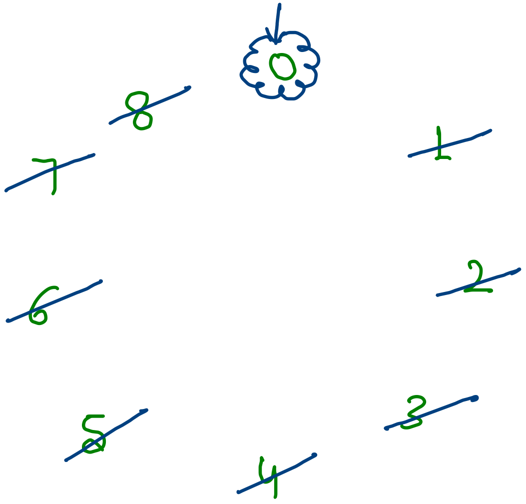
Josephus Problem

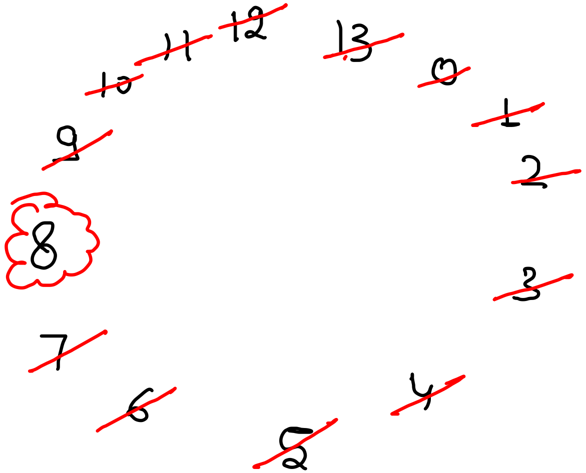
$\underbrace{n=7}$, $k=3$, Rotation killing, Remaining person.



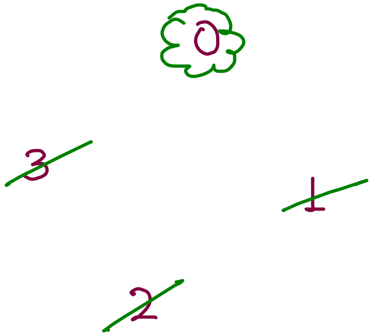
$n=9$, $k=4$



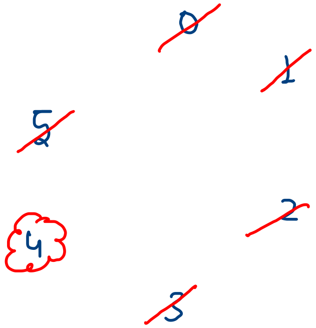
$n=14$ $k=4$

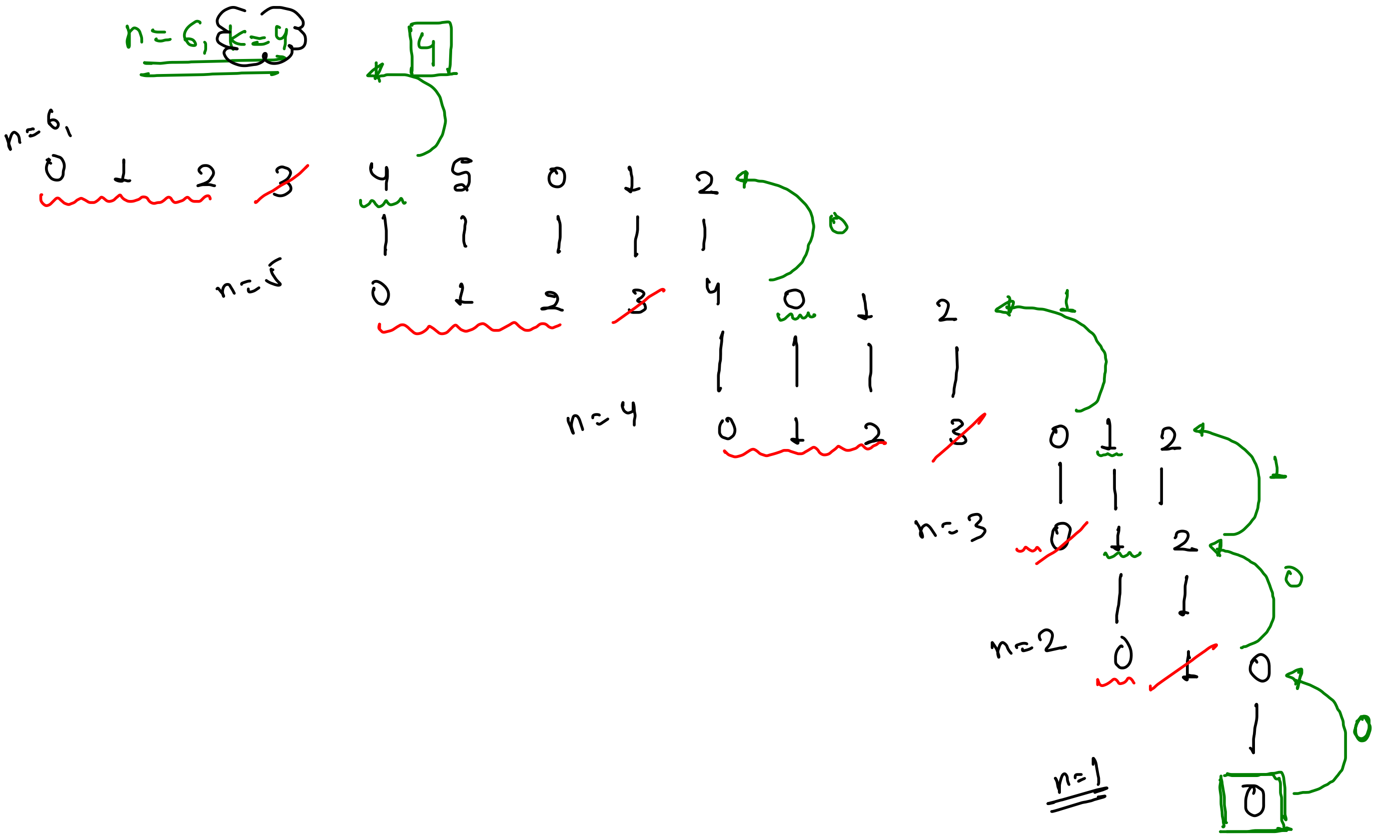


$n=4$, $k=2$



$n = 6,\ k = 4$





$n = 7, \; k = 3$

(n, k)

Base case = $n=1$ return 0

$\boxed{x = (y+k) \% n}$

$n=7$: 0 1 $\cancel{2}$ 3 4 5 6 0 $\boxed{1}$ ← 0 → x

$n=6$ $(n-1, k)$: 0 1 $\cancel{2}$ 3 4 5 0 1 ← 3 → y

$n=5$: 0 1 $\cancel{2}$ 3 4 0 1 ← 0

$n=4$: 0 1 $\cancel{2}$ 3 0 1 ← 1

$n=3$: 0 1 $\cancel{2}$ 0 1 ← 1

$n=2$: $\cancel{0}$ 1 ← 0

$n=1$: $\boxed{0}$

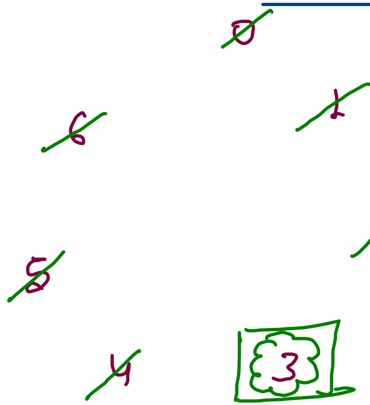
On a particular level → recursion result → y

Number on current level is → 'x'

$\boxed{x = \text{Factor} \times y}$

Factor??

$\boxed{x = (y+k) \% n}$



At $n=7$

$y = 5$.

$x = ?$

$x = (5+3) \% 7$

$\boxed{x = 1}$

$y = 3$

$x = ?$

$x = (3+3) \% 7 = 6$

At $n = 4$

$y = 2$

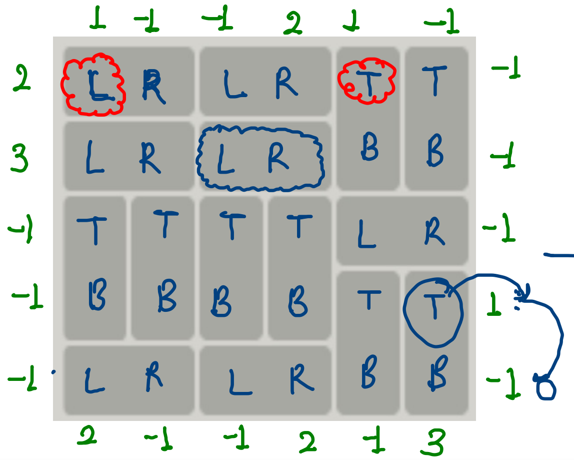
$x = ?$

$x = (2+3) \% 4$

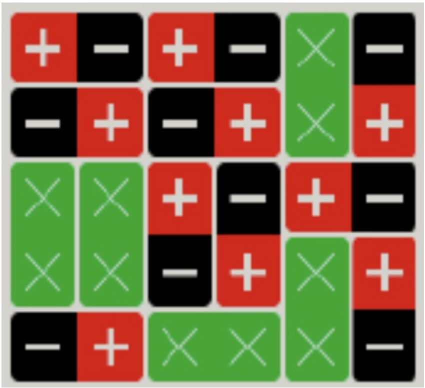
$\boxed{x = 1}$

Magnets Puzzle Problem

" orientation of magnets "



Result → orientation count Management



Top(+ve) 1 -1 -1 2 1 -1

left (+ve) 2 3 -1 -1 -1

right (-ve) -1 -1 -1 1 -1

bottom (-ve) 2 -1 -1 2 -1 3

n queen :] → combination of different kind of problem.

1. You are given n number of domino shaped bipolar magnets.
2. You have to place these magnets in M*N following the conditions.
3. Conditions are -
   a. Each box of 1*2 or 2*1 can contain a magnet or can be empty.
   b. Empty box can be represented by X's and magnets are represented by + and - sign.
   c. Digits along left and top side of the board represents the number of + in corresponding rows and columns.
   d. Digits along right and bottom of the board represents the number of - in corresponding rows and columns.
   e. -1 denotes that the corresponding row and column can have any number of + and - signs.
   f. No two adjacent cell can have the same sign.

+ve

Same poles are repulsive in nature, So physics doesn't allow us to place same pole magnet at adjacent position.

A number M
A number N
M*N characters containing only 'L', 'R', 'T' and 'B'. → orientation
(For 1*2 box 'L' represents left end and 'R' represents the right end)
(For 2*1 box 'T' represents top end and 'B' represents the right end)
N integers representing count of '+' along the top edge.
M integers representing count of '+' along the left edge.
M integers representing count of '-' along the right edge.
N integers representing count of '-' along the bottom edge.

L R → left Right

T B → Top Bottom

Note -> Check out the question video and write the recursive code as it is intended without changing signature. The judge can't force you but intends you to teach a concept.

option when we place magnet →

if(grid[i][j] == 'L') { //Horizontal placement

Two calls

① → [+ | -] success

② [- | +]

}else if (grid[i][j] == 'T') { //vertical placement

Two calls

① [+ / -]

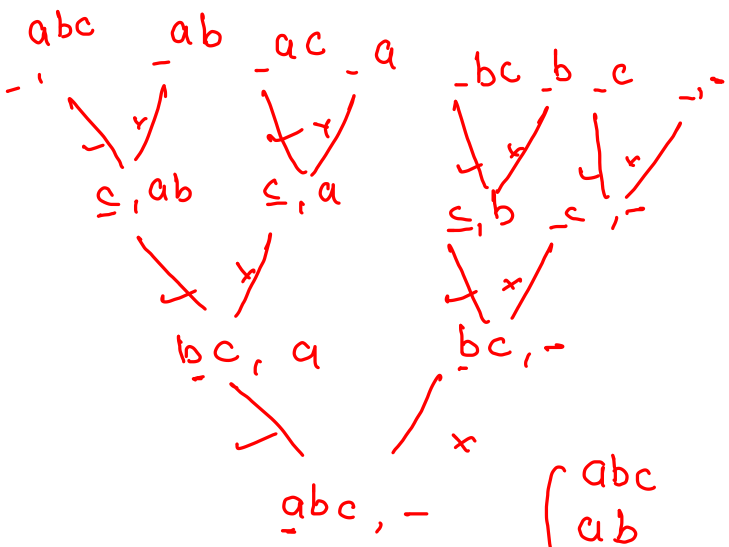
② [- / +]

}

No call → Place Nothing, just move at next cell.

Subseq calls

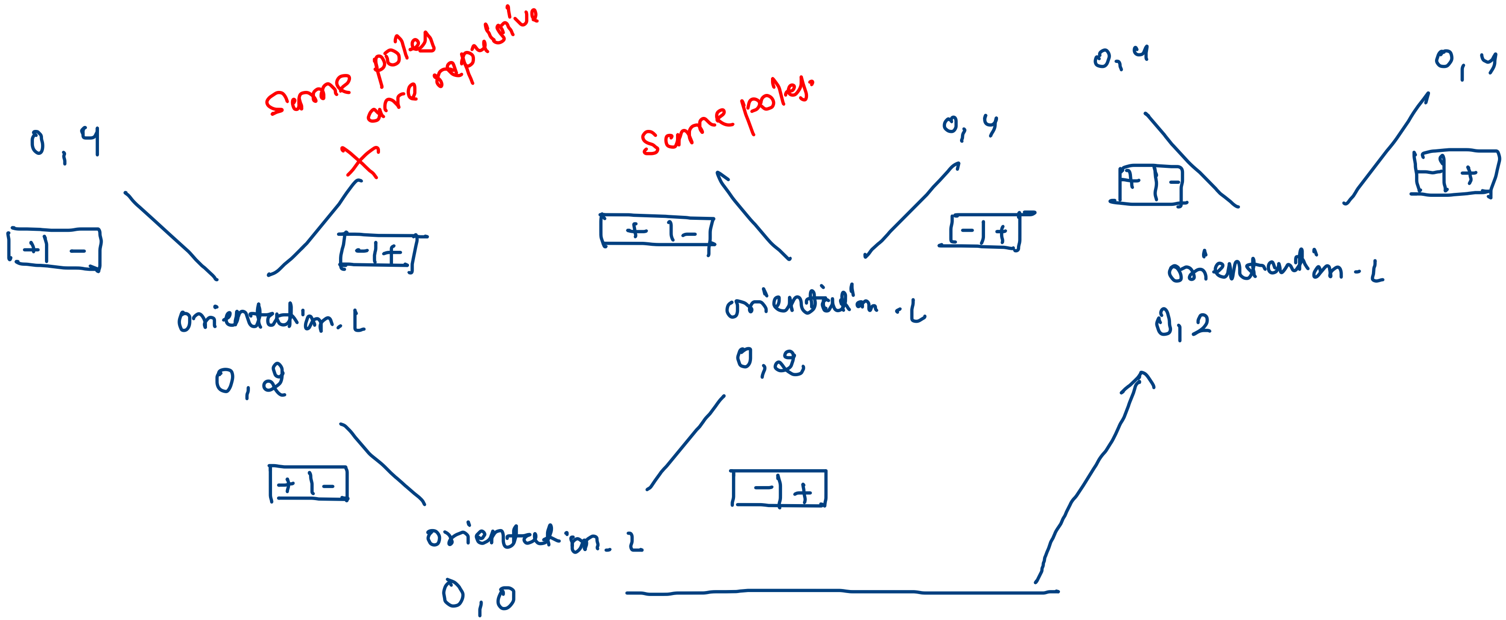
abc



abc
ab
ac
a
bc
b
c
_

q - different queens

Subseq → q_1, q_2, : q_n] Yes call No call


Same poles are repulsive
Same poles.
0, 4
+ | −
− | +
orientation. L
0, 2
0, 4
+ | −
− | +
orientation. L
0, 2
0, 4
0, 4
+ | −
− | +
orientation. L
0, 2
+ | −
− | +
orientation. L
0, 0