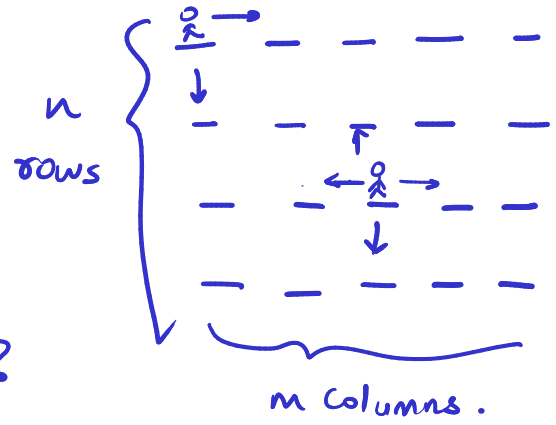
* **Idea:** ① Abstract problem → Template | Eg. 2 numbers ⇒ both odd or not
② Story problems → 3 variations | student swap, choc break, cut board

Q.1 Student Swap Problem

Eg. n = 4 m = 5 (student can swap once)



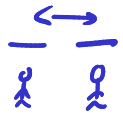
If everyone is allowed to swap

Is it possible that everyone swaps & nobody is at its original position ?

o/p: Yes/No.

n=1 m=1 — NO

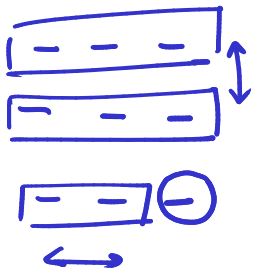
n=1 m=2 — YES



n=2 m=1 — YES

n=2 m=2 — YES

n=3 m=3 — NO.



n rows
m columns

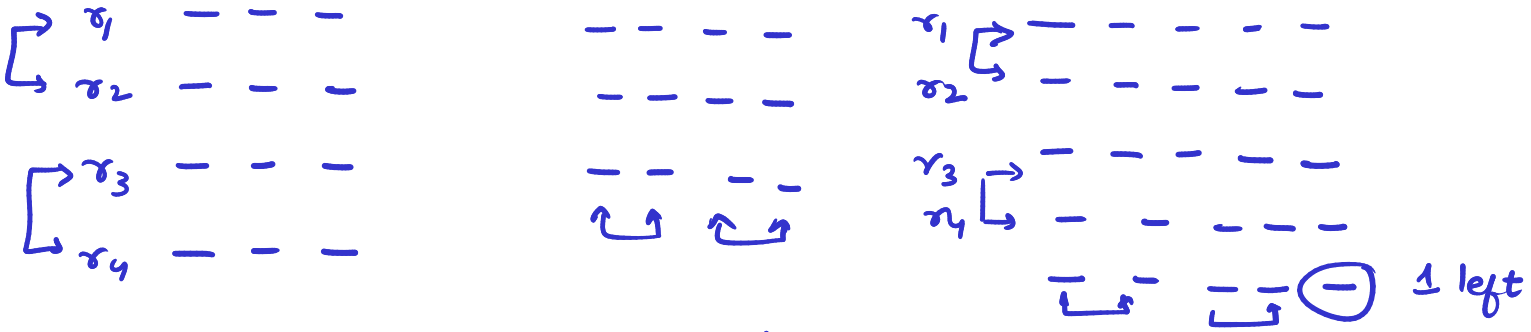
n*m students

Swap (I need to form pairs)

n*m must be even.

n is odd m is odd

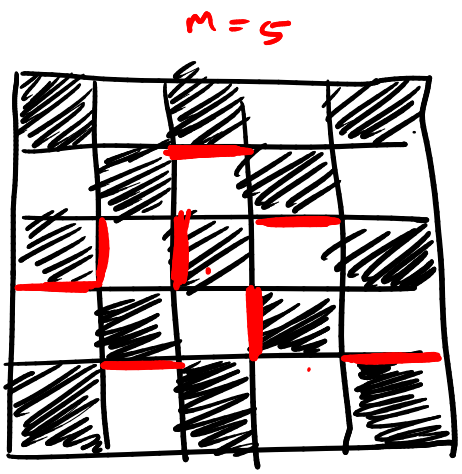
n * m → odd



Basic:

if m%2 != 0 and n%2 != 0 :
print (No)
else print (Yes)

Q.2 Chessboard cutting problem.



Game: A B. | A always starts first.

move: You can pick an edge of a square cell and cut it.

Win cond^n: If you are no longer able to perform a safe cut. If I will cut one more edge, this board will split in 2 parts. Final safe cut ⇒ win!

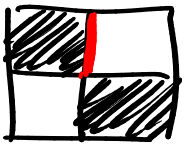
Q. Can A win the game?

Can A win?

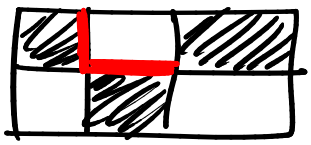
n = 1 m = 1 → No

n = 1 m = 2
n = 2 m = 1 → No

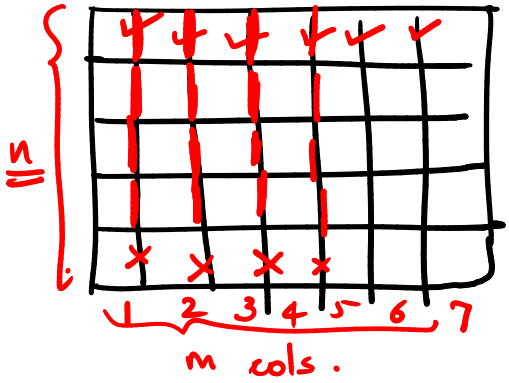
n = 2 m = 2 → YES



n = 2 m = 3 → No.



safe cuts = (n-1) × (m-1)



cond^n:

safe cuts on n × m board = (m-1) × (n-1)

safe cuts should be odd!!

⇒ m-1 & n-1 both should be odd.

```
if (m-1) % 2 != 0 and (n-1) % 2 != 0 :
    print (Yes)
else
    print (No)
```

Q.3 Chocolate break problem

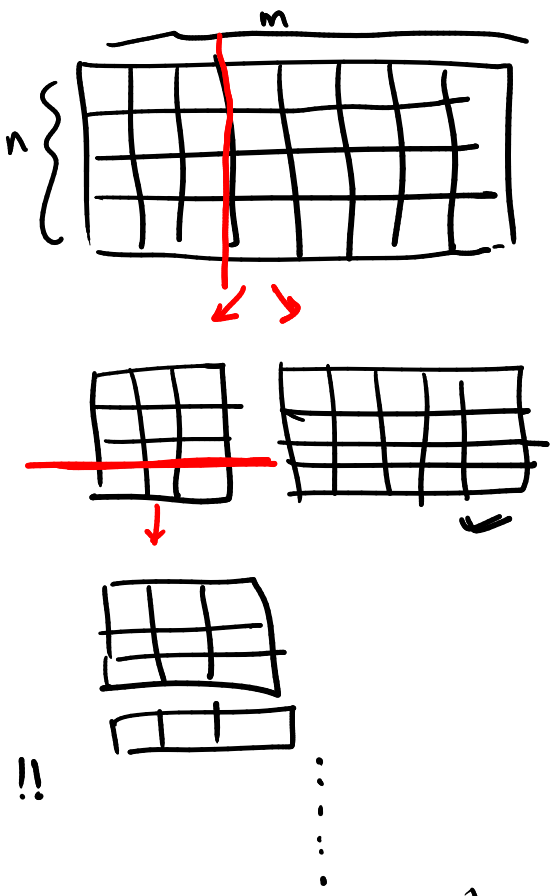
Game A B A goes first

move : You can pick any part and break it along the edge. (horizontal or vertical)

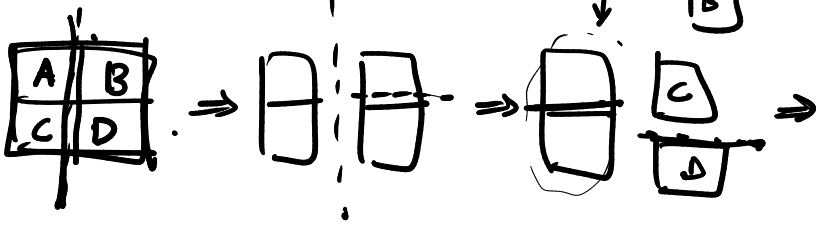
Win cond^n : You can't break any edge further because all edges are broken.

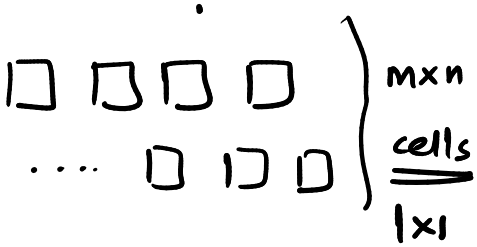
m×n chocolate → m.n 1×1 cells

The person failing to break → loses !!



Q. Can A win ?

		Can A win?
n=1 m=1		NO
n=2 m=1 m=2 n=1		YES
n=2 m=2 4 1×1 cells		YES.



No. of breaks = n*m − 1

Win cond^n: n*m−1 should be odd.

⇒ n*m should be even

⇒ n is even OR m is even

```
if (n%2 !=0 and m%2 !=0)
    print (No)
else
    print (Yes)
```

#1

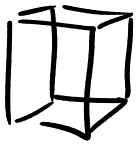
24 → no. of hrs in a day
↓ particular day of a month
data current year
movie & series

Information ✗

abc123...
mistake @ 8055
heycoach 123
blablabla @ 123
voltas @ 786
.apple8910

Information = Data + Context

Scenario 1



4 people
60 kg 50 kg
40 kg 70 kg

C = 200 kg

Q. Can all together go in this lift ?

Scenario 2

market 200 Rs.

Apple	Mangoes	Watermelon	Papaya
70	60	40	50

Q. Can you buy all fruits 1 kg each ?

Logic : Given a sequence of numbers, find their sum & tell if it is greater than a threshold C or not.

↳ Scenario 1, Scenario 2 } To process data, you don't need context.

Reframed : {Given 2 numbers, m and n, tell me if both are odd or not.}

+ Context ⟶ Problem solved !!

P.S.	Problem	Abstract (without context)	Story (with context)
Pro		Single logic can solve multiple problems! Multiplying superpower!	Yes! You are now a great problem solver. Interesting!!
Con		Knowing mere logic, will not tell you when to apply it.	How many qs are you going solve?

#2