Math For CP - Intermediate Problem Solving

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Problem 1

Vlad and Candies:

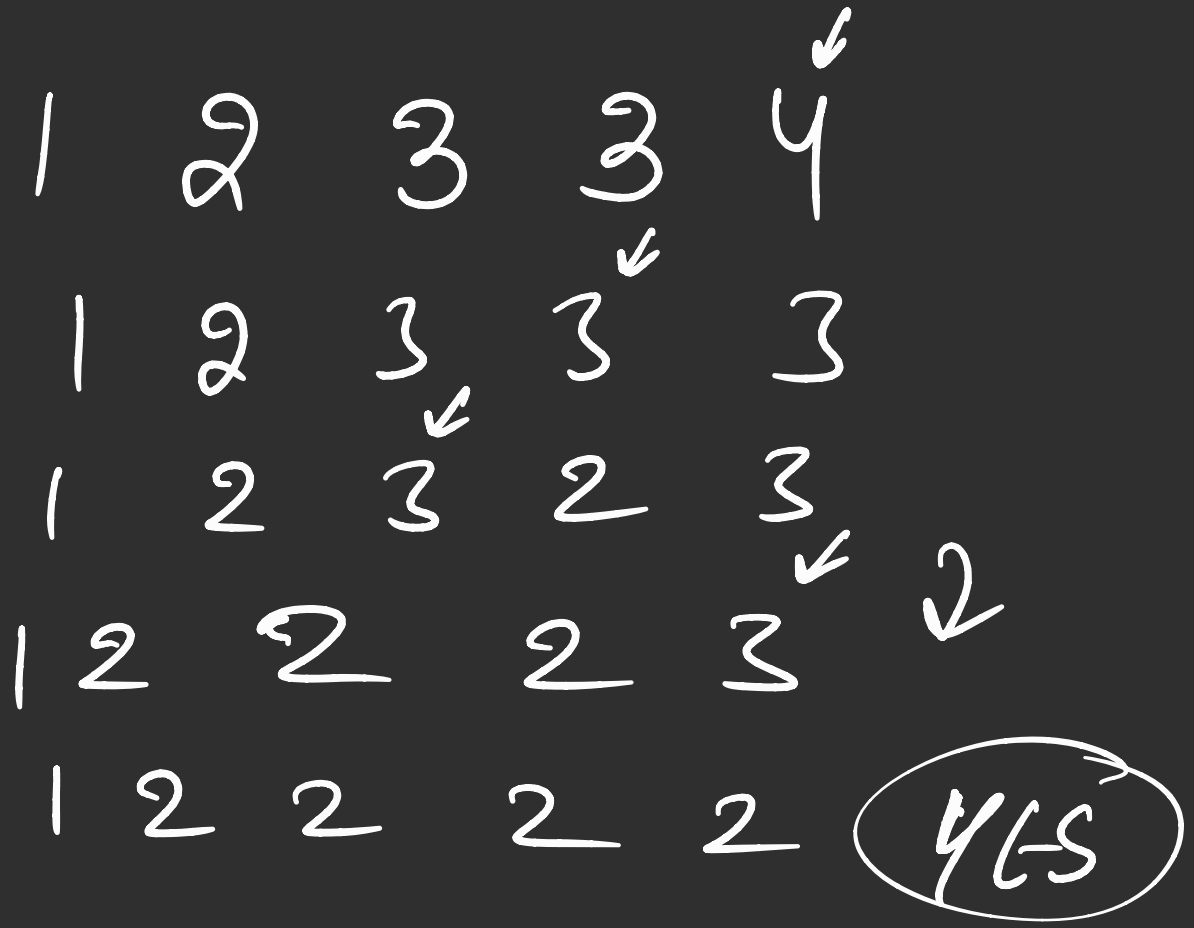
https://codeforces.com/contest/1660/problem/B

N

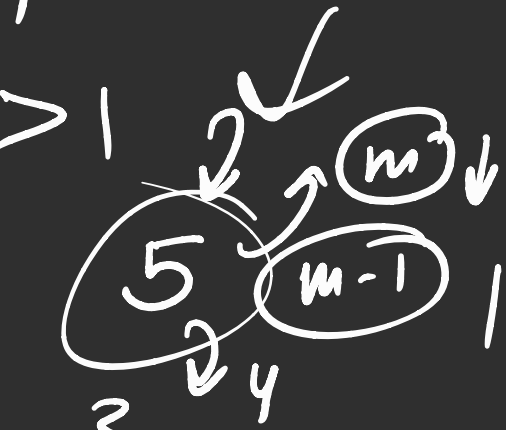
1 2 3 4 ... n

$a = \{a_1, a_2, a_3, a_4 \dots a_n\}$

↳ $a = \{0, 0, 0, 0 \dots 0\}$



Sort the array



1 2 3

1 2 3 3

1 2 2 2

1 2 1 2

1 1 1 2

Base Case → n = 1

1 1 1 1

1 1 0 1

1 0 0 1

1 0 0 0

0 0 0 0

n == 1
a[0] == 1
} YES

d = a - b (a - 1)
d = a - 1 - (b - 1) = a - b

n == 1
a[0] > 1
} NO

c = 1

2 4 6

2 4 5

NO

Problem 2

Longest Divisors Interval:

https://codeforces.com/problemset/problem/1855/B

N

[l, r] ↗ size ↑ largest

↗

i → (N % i == 0)

N = 990990

[9, 10, 11] → 3

990990 % 9 == 0

% 10 == 0

% 11 == 0

990 990

$[9, 10, 11] \rightarrow 3$

$[s_1\ s_2\ s_3] \rightarrow 3$

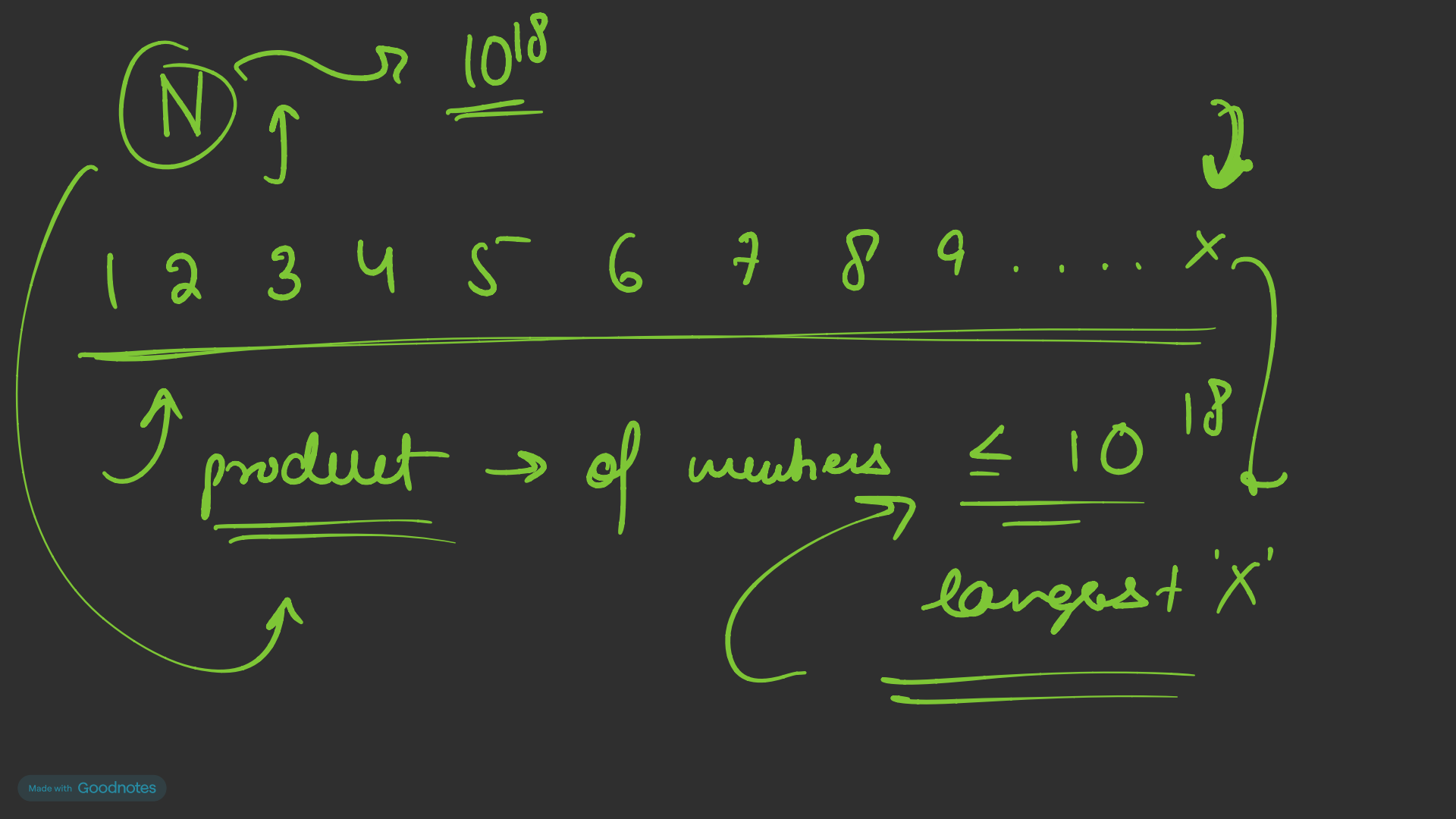
$\|\ \ \|\ \ \|$

$1\ \ 2\ \ 3$

Arg =

$$[\, l \;\; l+1 \;\; l+2 \;\; l+3 \;\; \ldots \;\; r-2 \;\; r-1 \;\; r \,]$$

$$[\, 1 \;\; 2 \;\; 3 \;\; 4 \;\; \ldots \;\; r-l+1 \,]$$



Problem 3

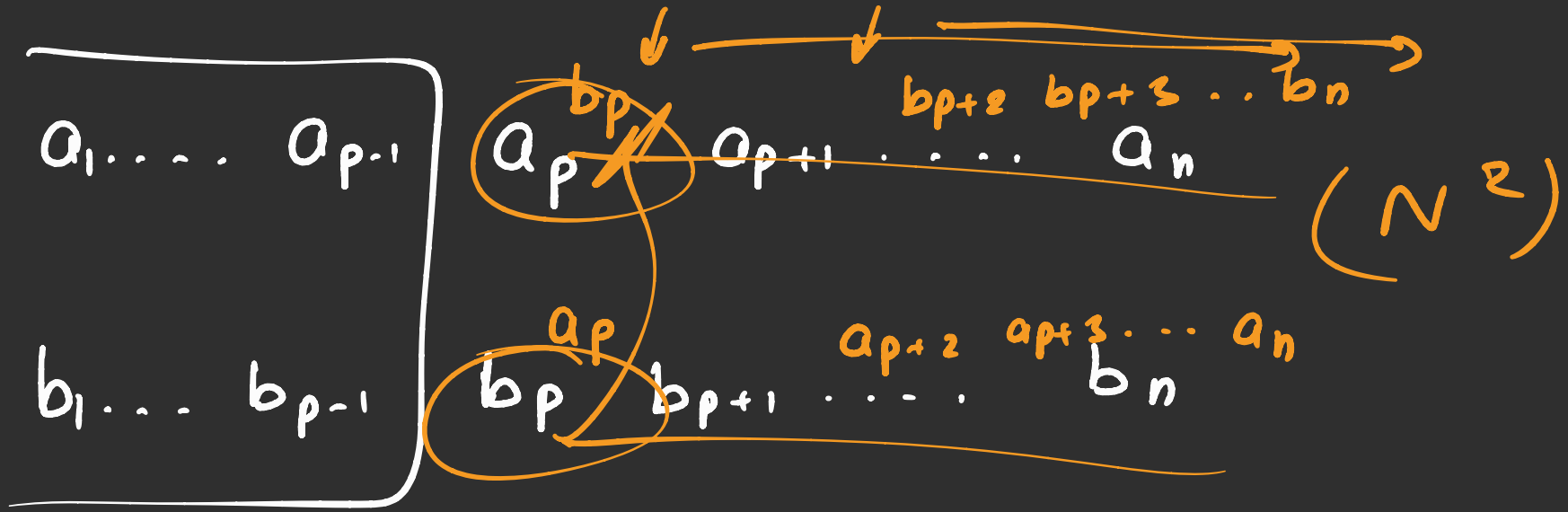
Array Balancing:

https://codeforces.com/contest/1661/problem/A

N

$$a = \{ a_1, a_2, a_3, a_4 \ldots\ldots a_{n-1}\ a_n \}$$

$$b = \{ b_1, b_2, b_3, b_4 \ldots\ldots b_{n-1}, b_n \}$$



not swap

$$S + |a_p - a_{p+1}| + |b_p - b_{p+1}|$$

swap

$$S + |b_p - a_{p+1}| + |a_p - b_{p+1}|$$