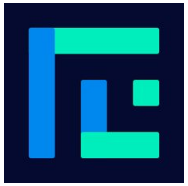
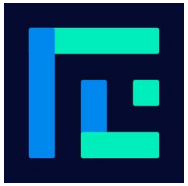


Problem Solving

Math for CP

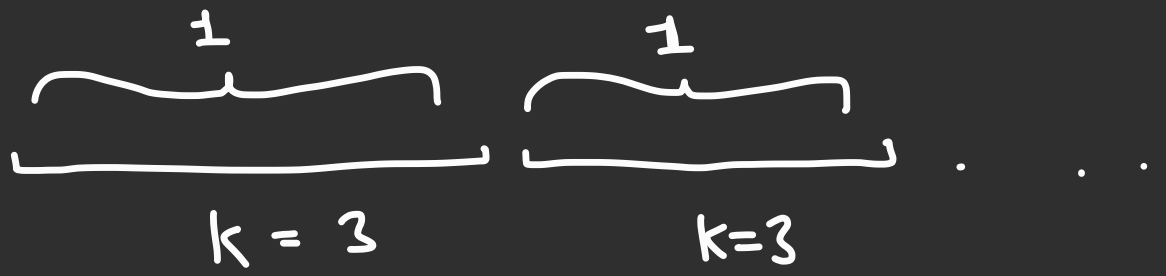
- Viraj Chandra

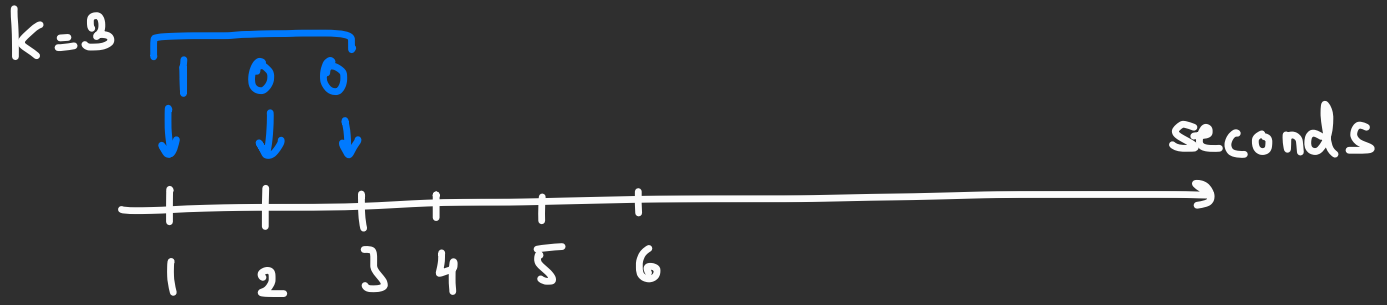
Problem 1 - Upload More RAM

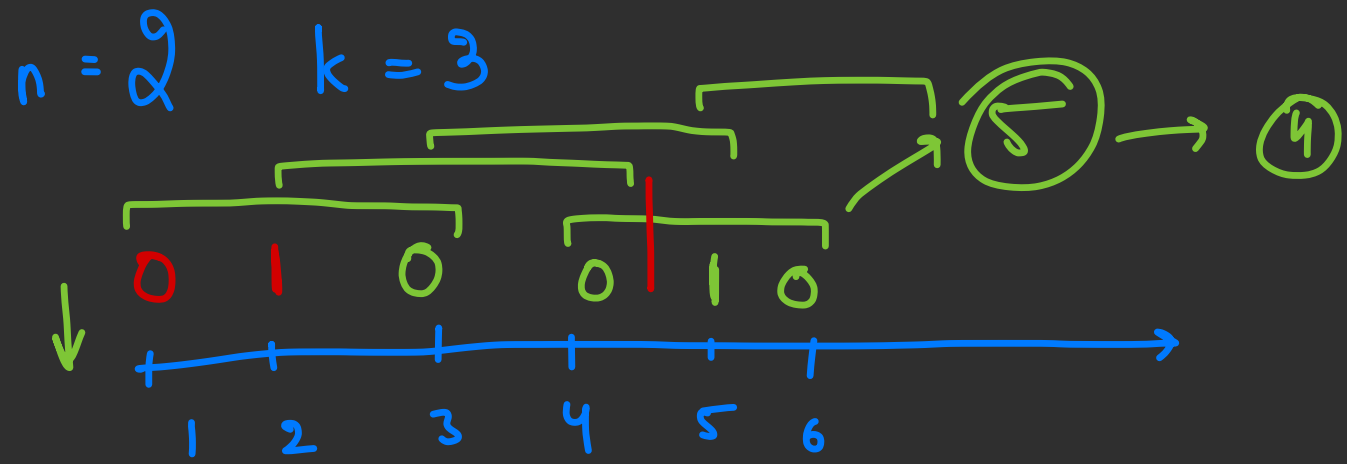


n = 8

1 sec - 0, 1 RAM



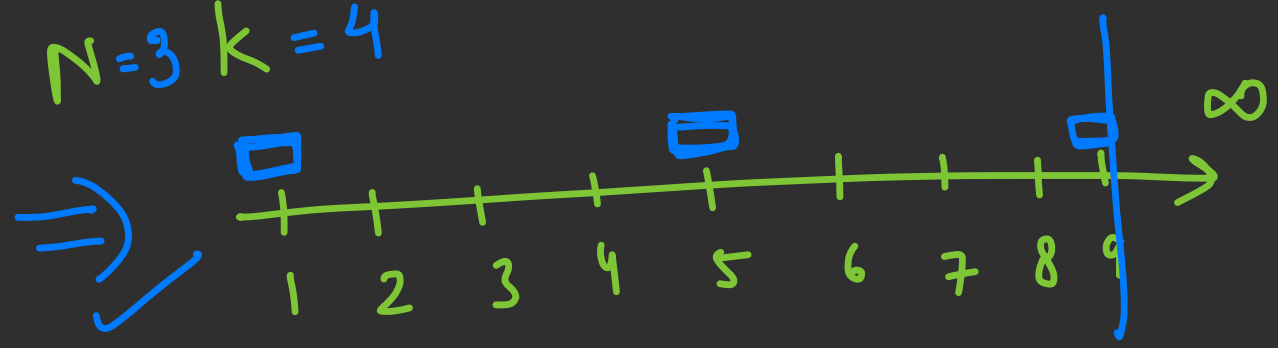




$O(N^2) \rightarrow O(N) \rightarrow O(1)$

↑

$N = 3 \quad k = 4$



$N \approx 10^9$

$O(\log N)$

$O(1)$

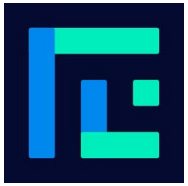
AP $= \quad 1 \quad k+1 \quad 2k+1 \quad 3k+1 \quad \ldots\ldots$

N

$\Rightarrow T_n = a + (N-1)\,d$

$= 1 + (N-1)\,k$ ✓ $O(1)$

Problem 2 - Maximum Multiple Sum



N

N = 17

$2 \leq X \leq N$

$X = 2 \cdots$ $X = 4$ $X = 5$ $X = 6$ $X = 7 \cdots$ $X = N$

$4 + 8 + 12 + 16 =$ Sum

↓

X

$O(N^2)$ → $O(1)$

for(2 . . . N)^i

sum=0

{ for(i   i += i)

{ if (m ≤ n)

} Sum += m

Sum => max

}

$2 \le X \le N$

$N = 7$

$X = 2 \rightarrow 2 + 4 + 6 = 12$

$X = 3 \rightarrow 3 + 6 = 9$

$X = 4 \rightarrow 4$

$X = 5 \rightarrow 5$

$X = 6 \rightarrow 6$

7

$N = 13$

$kx \le n$

$k \le \frac{n}{x}$

2

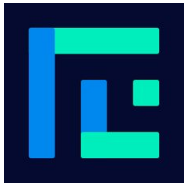
$$AP_{sum} = \frac{n}{x}\frac{}{2}\left(2x + \left(\frac{n}{x}-1\right)d\right)$$

$$\Rightarrow n + \frac{n^2}{x^2}(x-1)\,d$$

Hence Proved

k = terms

Problem 3 - Large Addition



1 3 3 7

5, 6, 7, 8, 9 ↓

$5 \le d \le 9$

large

n

a = ...999 / .555

b = ...999 / ..555

1998 / 1110

119

"NO"

108

"NO"

X = ___ X 1 → "NO"

X = ≥ 8 → "NO"

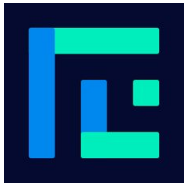
X = not last not first → $1 \le d \le 9$

a = $\_ \ge 9$ ✓

b = $\_ \ge 9$

0 8

Problem Links -



1. https://codeforces.com/problemset/problem/1987/A
2. https://codeforces.com/problemset/problem/1984/B
3. https://codeforces.com/problemset/problem/1985/B
4. https://codeforces.com/problemset/problem/1987/B