C++ STL Beginner Problem Solving

- Arun Kumar Singh

Problem 1

Different Divisors:

https://codeforces.com/problemset/problem/1474/B

a → divisors - $C \geq 4$

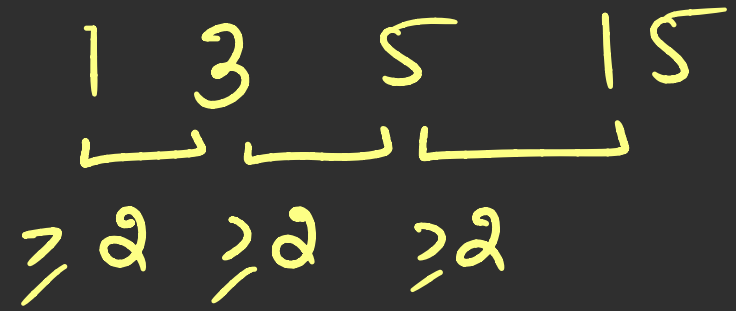
↳ d_1 d_2 d_3 d_4 ....

$abs(d_i - d_j) \geq d$

↳ smallest

$d = 2$

$ans = 15$



$$\frac{10^8}{3 \times 10^3} \Rightarrow \frac{1}{3} \times 10^5$$

$$\Rightarrow 0.33\ldots \times 10^5$$

$$\Rightarrow \underline{3 \times 10^4} \text{ testcase}$$

10^6

$$N = p_1^{a_1} \times p_2^{a_2} \cdots p_m^{a_m}$$

$$N = 2^3 \times 3^2 \times 5^1$$

$2^0\ 2^1\ 2^2\ 2^3$ → 4

$3^0\ 3^1\ 3^2$ → 3

$5^0\ 5^1$ → 2

$4 \times 3 \times 2 = 24$ → divisors

N = no of divisors

$$(a_1+1) \times (a_2+1) \times (a_3+1) \dots (a_m+1) \geq 4 \quad (==4)$$

4 → 1 × 4 → op1 ✓

2 × 2 → op2

opl → 1 X 4

$(a_1+1) \times (a_2+1)$

$a_1+1=1$

$a_1=0$

$a_2+1=4$

$a_2=3$

$N = (\text{prime})^3$

p

$N = p^3$

opp - 2×2

$(a_1+1) \times (a_2+1)$

$N = p \times q$

$a_1 + 1 = 2$ $\quad$ $a_2 + 1 = 2$

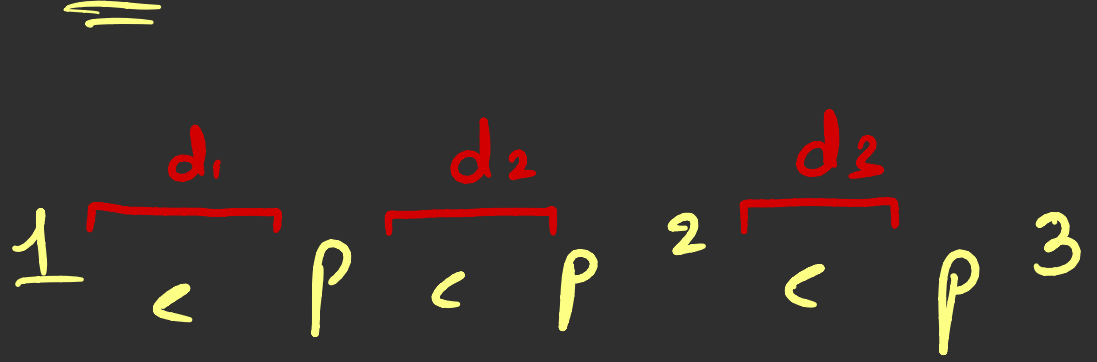
$a_1 = 1$ $\quad$ $a_2 = 1$

$N \rightarrow$ has to look like

$$p^3 \quad \text{OR} \quad pq$$

p & q are primes ≥ 2

Case 1 → p^3 $\quad p \geq 2$



d_1 d_2 d_3 → all are $\geq d$

$p - 1 \geq d$
$p^2 - p \geq d$
$p^3 - p^2 \geq d$

$(p-1) \geq d$
$p(p-1) \geq d$
$p^2(p-1) \geq d$

If (i) is true then (ii) & (iii) are also true

$p = 3$

1	3	9	27
1	p	p^2	p^3

$d = 2$

$\downarrow$

$d+1 = 3$

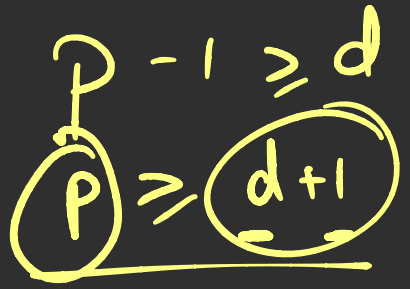
$3 \geq 3$

$p - 1 = 2 \geq 2$

$p^2 - p = p(p-1) = 3 \times 2 = 6 \geq 2$

$p^3 - p^2 = p^2(p-1) = 9 \times 2 = 18 \geq 2$

we want the prime value p which has this condition true i.e



Case 2 → pq (p < q)

(p ≥ 2)

(q ≥ 2)

$p-1 \geq d \rightarrow p-1 \geq d$

$q-p \geq d \rightarrow q-p \geq d$

$pq-q \geq d \rightarrow q(p-1) \geq d$

we now for case 2

want another prime q

Seuch that

$$q - p \geq d$$

$$q \geq d + p$$

P q

(p×p×p , p×q)

Case 1 Case 2

min

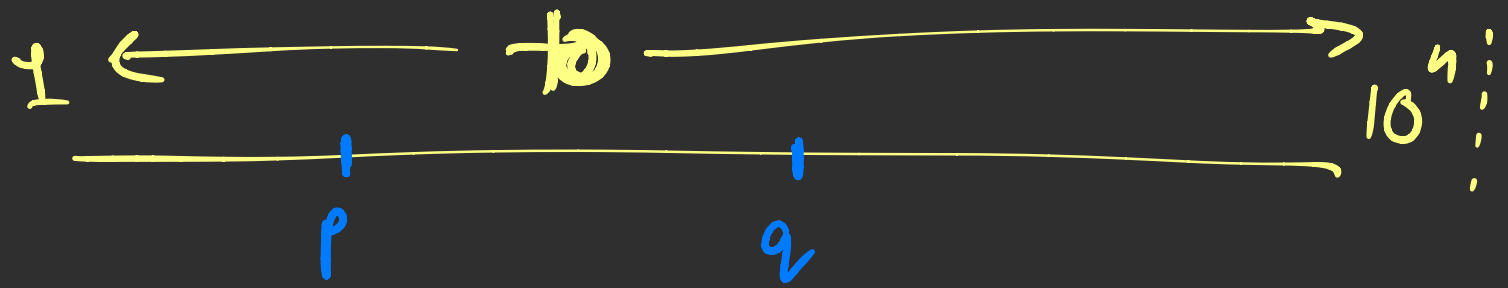
Ans

$d \approx 10^4$

$p \approx 10^5$

$d_1 \quad d_1 > 10^4$

$1 \quad p \quad p^2 \quad p^3$



SQRT method

↓

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for( 1 i to 10^4)
{  SQRT method (i)
}
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$10^4 \times \sqrt{10^4}$

$\Rightarrow 10^6$

precompute → list of primes → 10^6

while (t--)

{

cin >> d

$\log n$ LB(d+1) = p

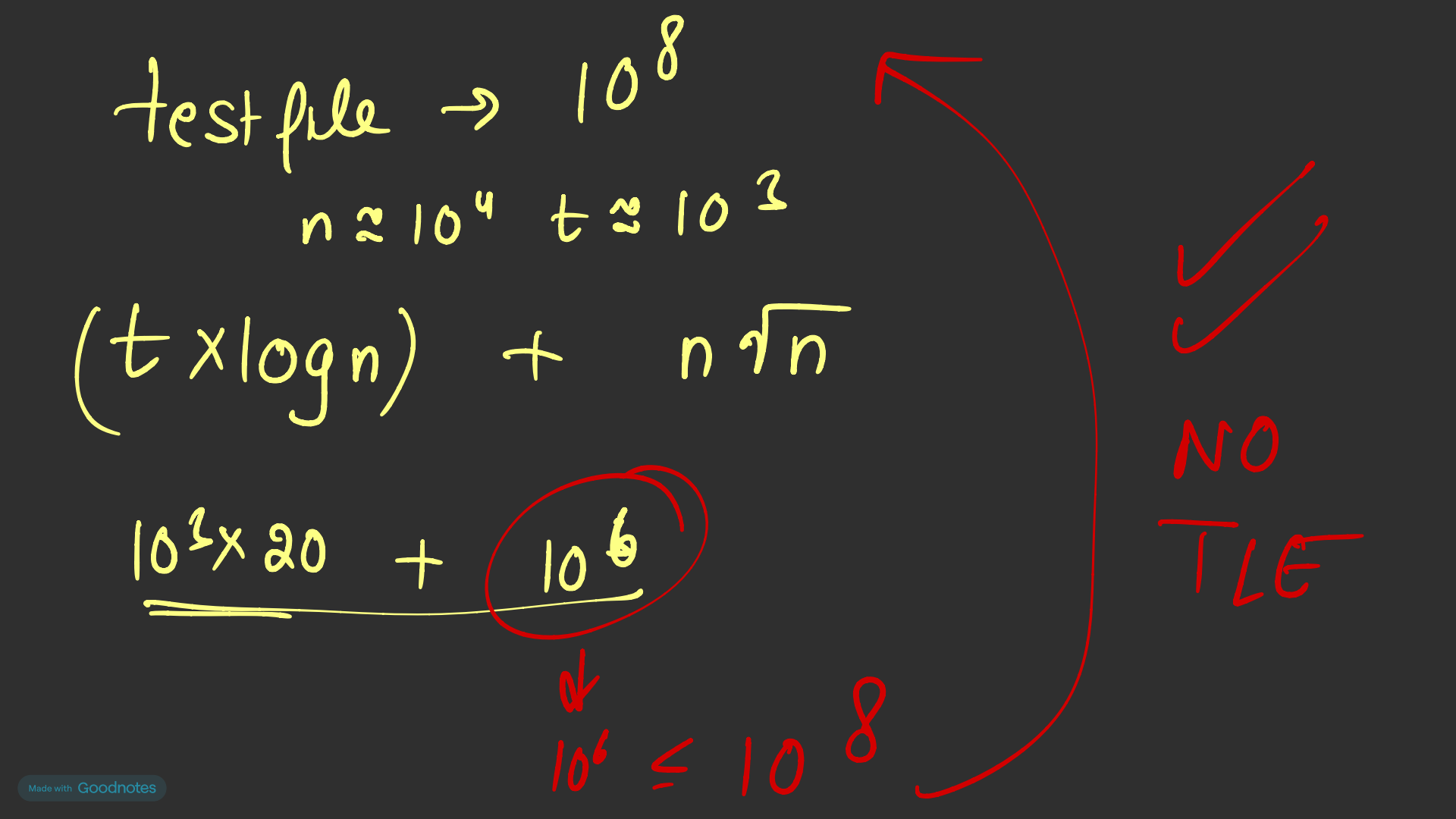
$\log n$ LB(d+p) = q

(p³, qp) → ans

}

($t \log n$)

($\log n$)


test file → 10^8
$n \approx 10^4$ $t \approx 10^3$
$(t \times \log n) + n\sqrt{n}$
$10^3 \times 20 + 10^6$
$10^6 \leq 10^8$
NO
TLE

Problem 2

Helmets in Night Light:

https://codeforces.com/problemset/problem/1877/B

Problem 3

Olya and Game with Arrays:

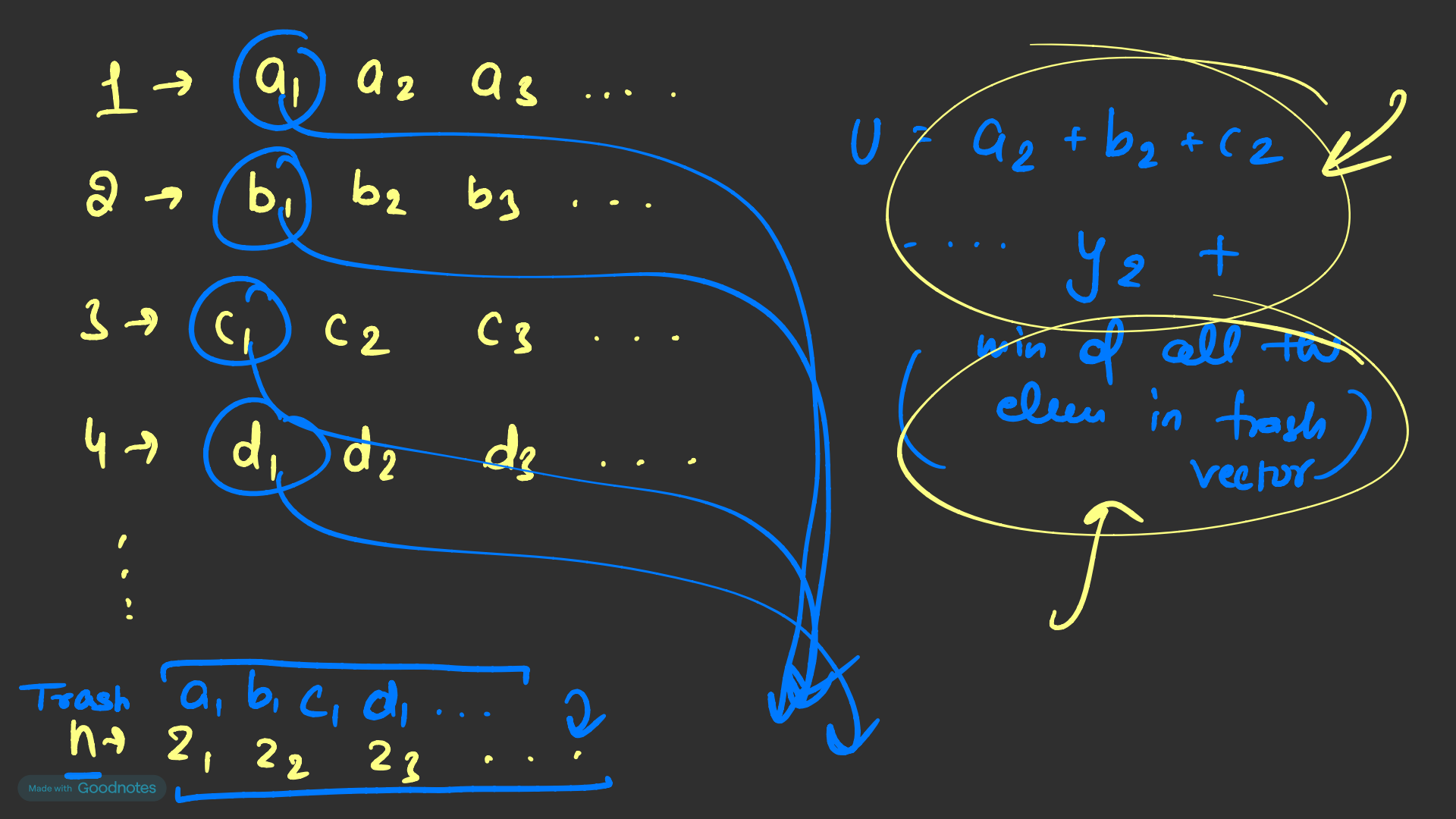
https://codeforces.com/problemset/problem/1859/B

$1 \rightarrow a_1 \quad a_2 \quad a_3 \quad a_4 \quad a_5 \quad \cdots$

$2 \rightarrow b_1 \quad b_2 \quad b_3 \quad b_4 \quad b_5 \quad \cdots$

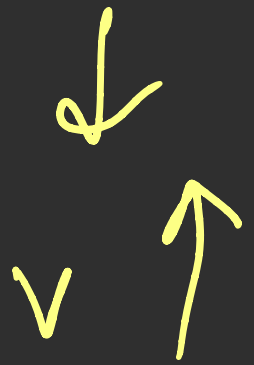
$\vdots$

$n \rightarrow z_1 \quad z_2 \quad z_3 \quad z_4 \quad \cdots$



The array which has the initial 2nd lowest min should be trash

$\leq$ minimums of each array



$$V = \min_1 + \min_2 + \min_3 \ldots \min_n$$