Class 23

Monday, July 5, 2021 10:07 PM

CBABA $n^2 \cdot \log(n)$

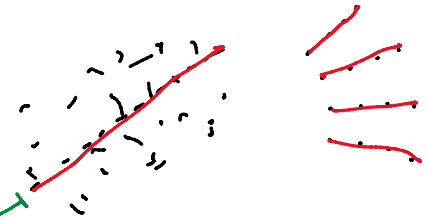
Randomized Approach

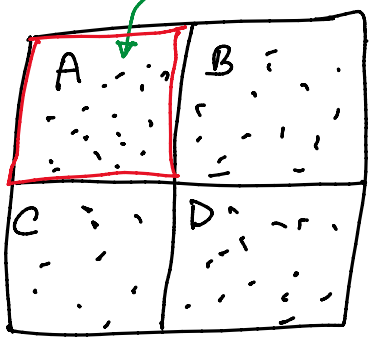
#1 N টা পয়েন্ট / 2D point (x, y)

at least N/4 সংখ্যক পয়েন্ট collinear

$1 \le N \le 10^5$

$1 \le x, y \le 10^9$



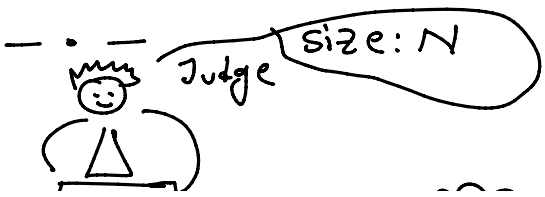


$(N^2 \cdot N) \rightarrow O(N^3)$

$\frac{1}{4} \times \frac{1}{4} = \frac{1}{16}$

$\frac{15}{16} \times \frac{15}{16} \times \frac{15}{16} \times \cdots \times \frac{15}{16} = \left(\frac{15}{16}\right)^{10}$

$300 \times N \rightarrow O(300 \times N)$



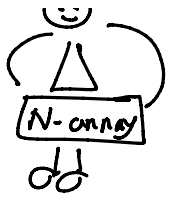
#2 $1 \le N \le 10^5$

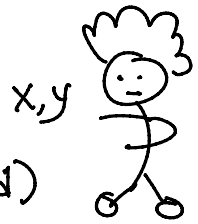
#2

$1 \le N \le 10^5$

$1 \le d \le 10^{18}$

$1 \le Q \le 103000$





$60 \approx \log(d)$

10 5 18 8

10 $O(N \cdot \log(d))$

x_1 x_2 x_3 x_4

10

n!

$(x,y) \rightarrow [a_x \ge y]$ → True / False

$[1, 10^{18}]$

$\log(10^{18}) \approx 60$

$\log(d_{max})$

[1 ~ 100] → 50

[1 - 49] → 25

[1 - 24] → 12

[1 - 11] → 6

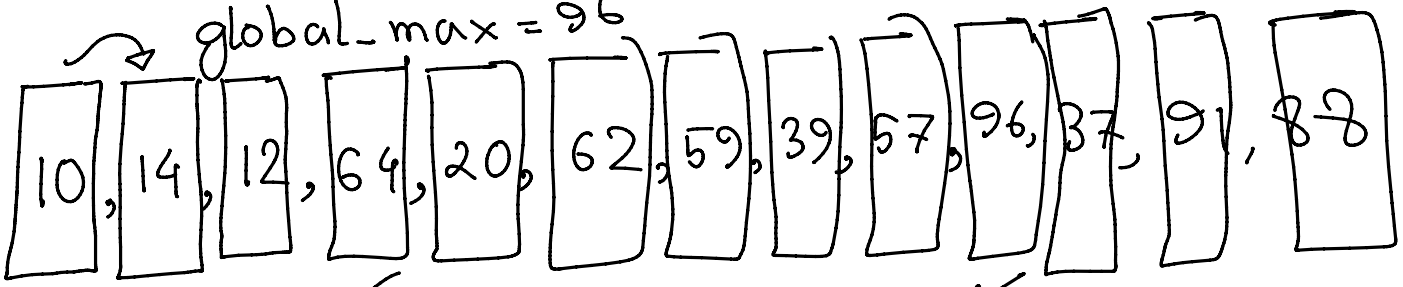
[7 - 11]

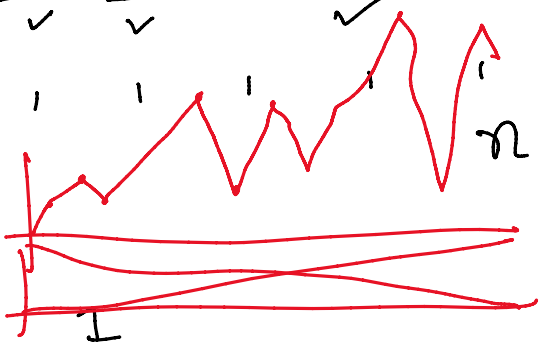
$n + (\log(n) \times \log(d))$

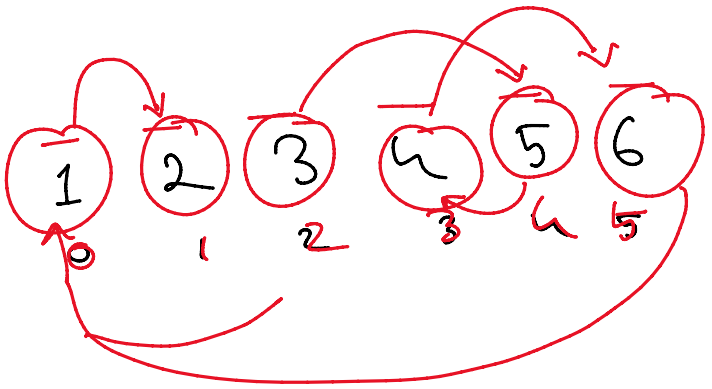
17 × 60

$a_2 \ge 14$

global_max = 96







(2) (4) (3) (5) (0) (1)

1

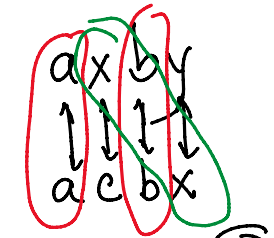
1

a_0 a_m a_1 a_2 a_4 a_3 a_7

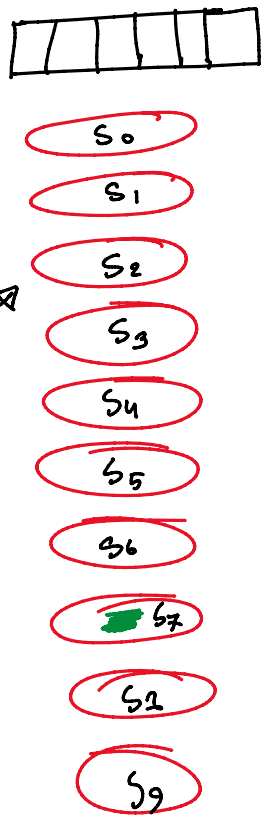
$1 + 1 + 1$

Bulls & Cows $N = 10^6$

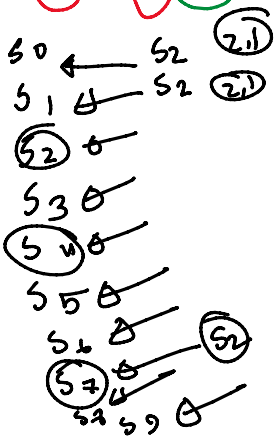
(2,1)

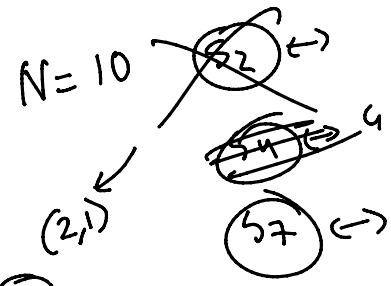


acbx

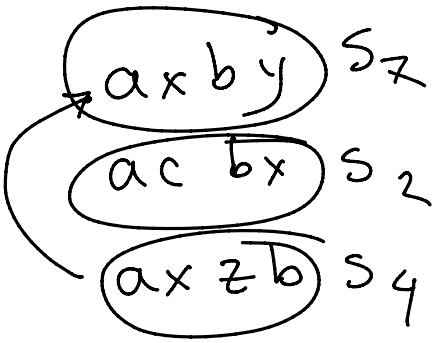


(2,2)





6



Monte Carlo