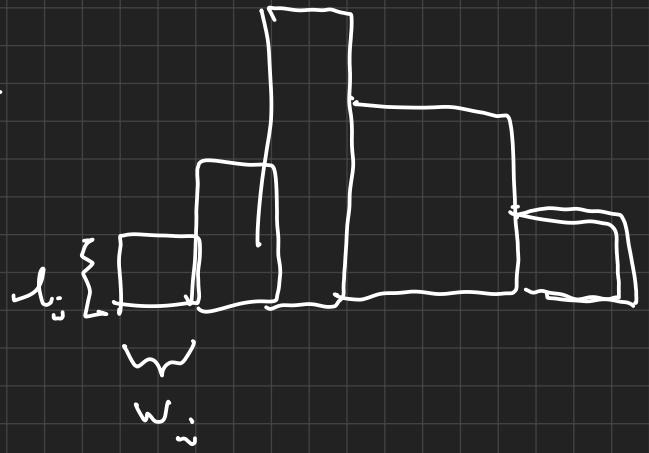
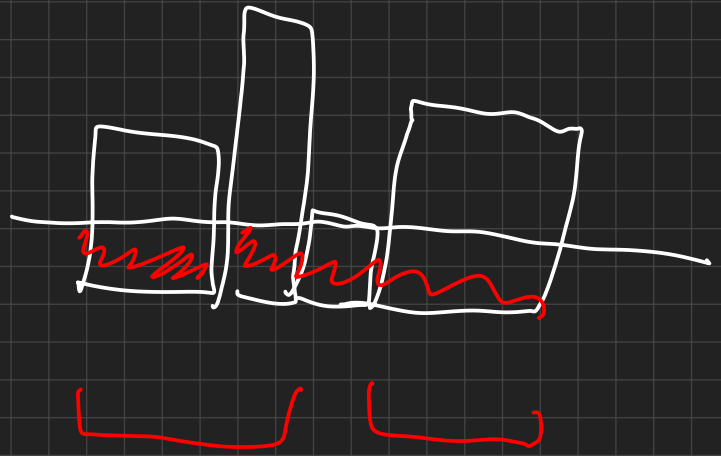
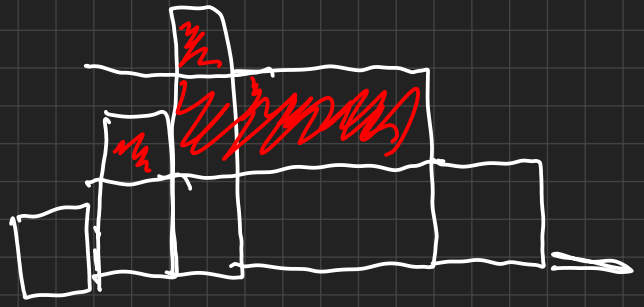
ASPRO CEOI 20 FancyFence





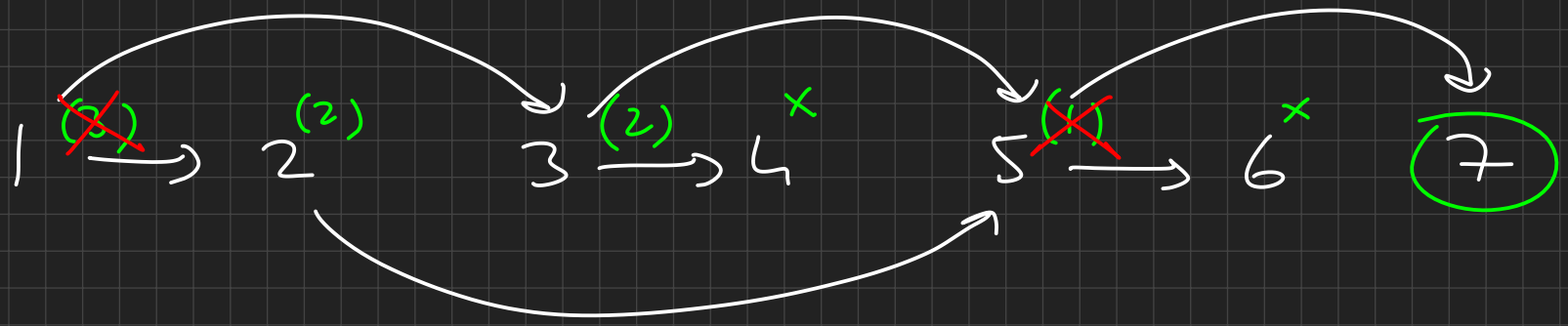
$O(N \ell_{opt} N)$



$O(N)$

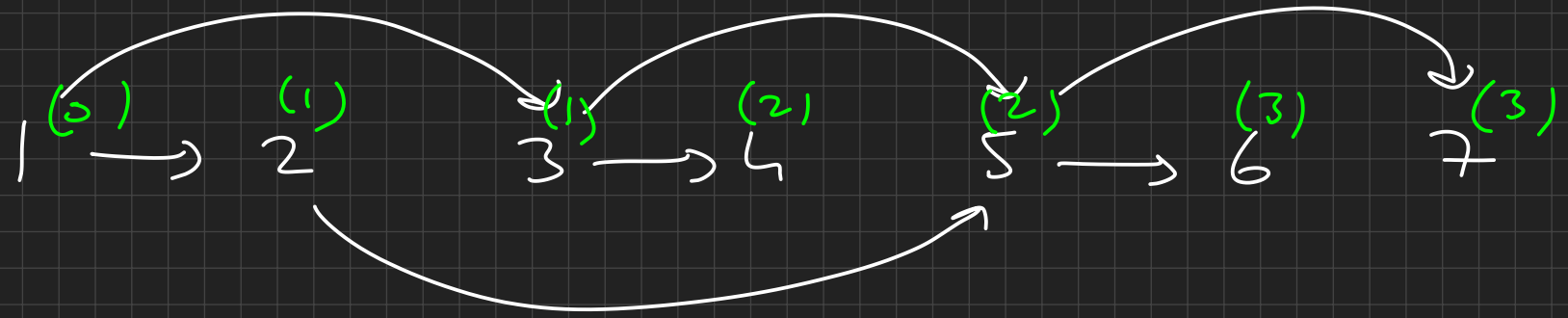
SALATO

(aka JOI 2018 _ Bitaro)



dp(i) = longest path che finisce in i

→



- nodi bannati $\geq C$

  stessa dp senza partire dai nodi bannati

  $O(n+m)$

  quante volte ho questo caso?

  $\frac{\sum Y}{C}$ volte

- nodi bannati $< C$

  caso brutto: il longest path usa un nodo bannato $\Rightarrow$

  $\Rightarrow$ provo il second longest path

  caso ancora più brutto:

  il $^{\text{second}}$longest path usa un nodo bannato

  ⋮

  [fino a C volte]

$dp(i)$ = longest path che finisce in i (lunghezza $\leq C$)

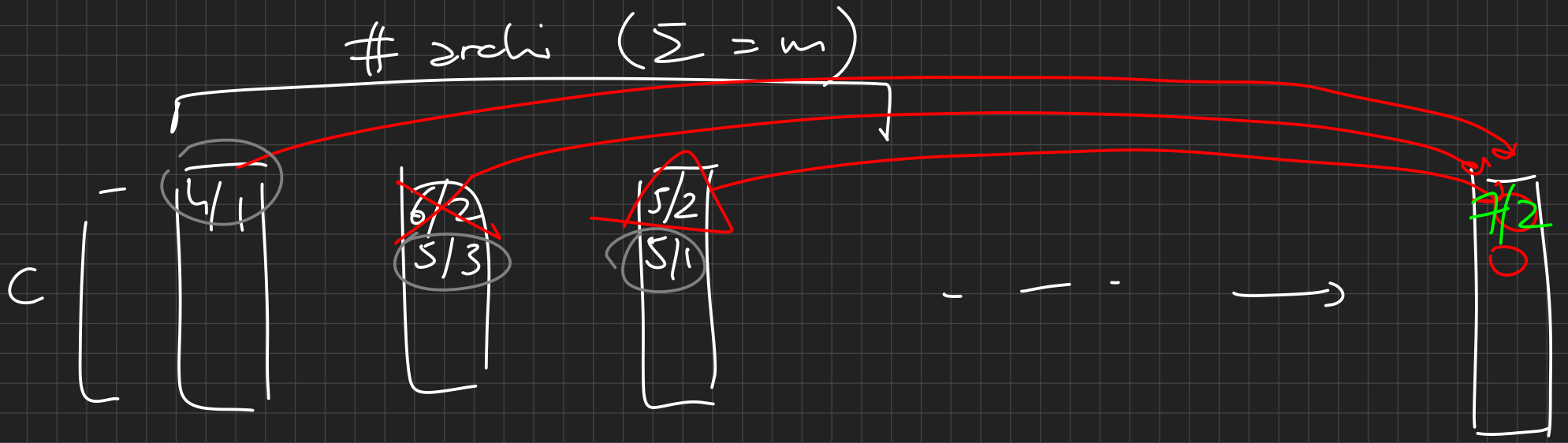
e controllo il primo non bannato

$O((n+m)\,C)$

totale: $O\left((n+m)\,C + \frac{(n+m)\,\Sigma\bar{y}}{C}\right)$

$C = \sqrt{\Sigma\bar{y}} \longrightarrow O\left((n+m)\sqrt{\Sigma\bar{y}}\right)$

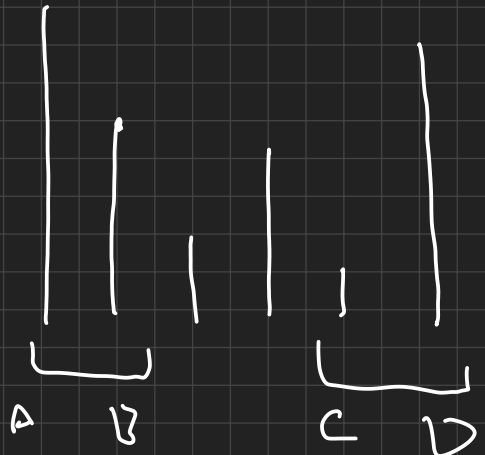
$$dp(i) = \bigcup_{\text{esiste } j \to i} dp(j)$$



$O(archi \cdot C) \longrightarrow O((n+m)C)$

AMARO

APIO 2021 JUMPS



A=B C=D

finché salto massimo $< H_c$ salto al massimo

dopo mi muovo sempre a destra

per ogni k → altezza massima partendo da i
con 2^k salti (salto sempre verso →)

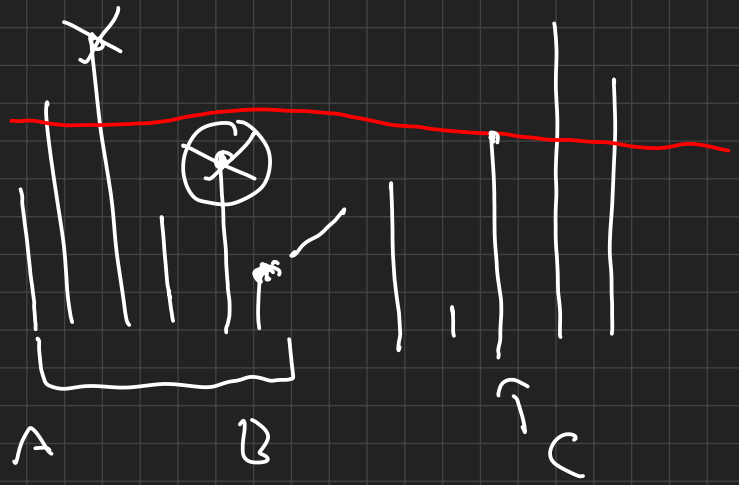
stesso binary lifting muovendosi a dx
a sx

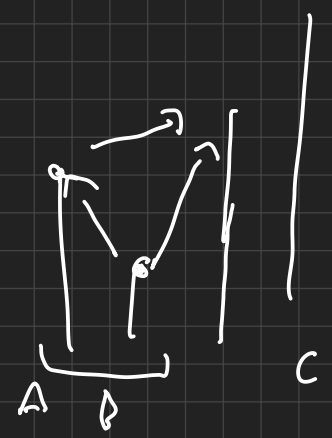
trovo max in $\log N$, poi i salti per arrivare a C in $\log N$

provo a saltare di 2^k con k decrescente

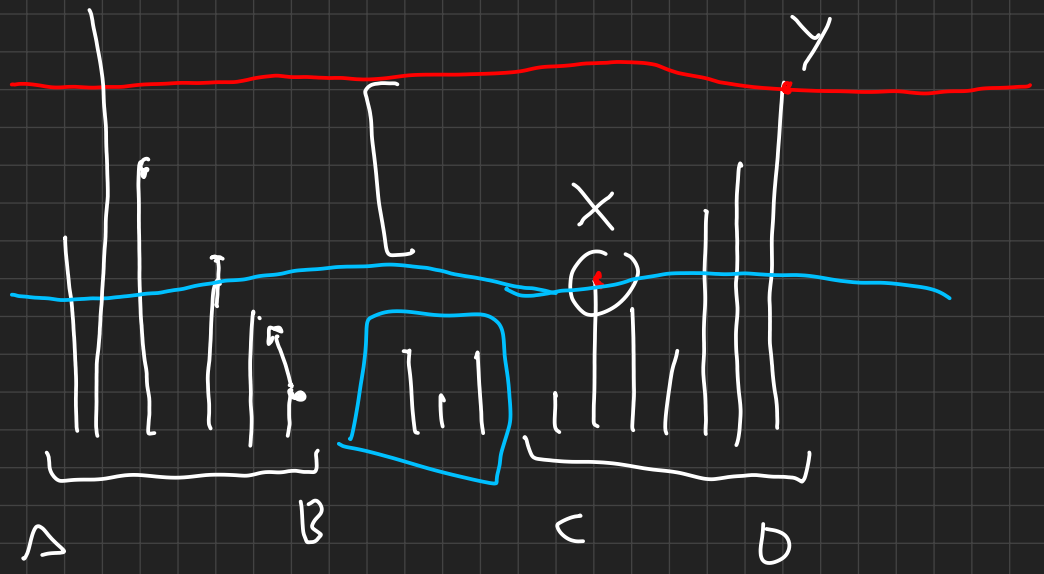
- se $h > h_c$ → non salto
- se $h < h_c$ → salto

Caso C=D





Full



caso 1: arrivo a X → sol per C=D

caso 2: cerco il max salto la linea rossa → el rampe

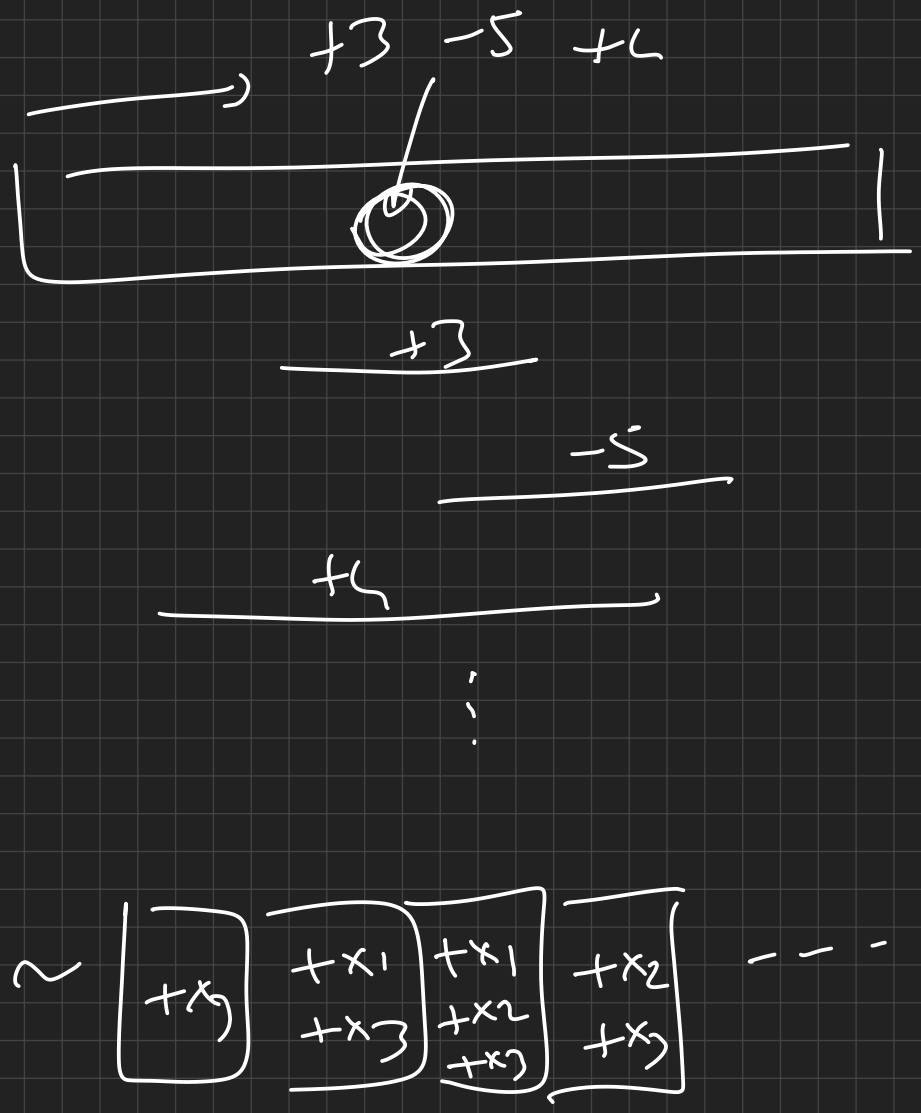
binary lifting fino

DOLCE (aka IOI21_Candies)

- range add x (x pos. o neg.)
  - dopo il range add, tutti gli el. vengono riportati tra 0 e c_i
- trova l'array alla fine

  ↓?

- trova il 1° el., il 2° el., il 3° el., ---

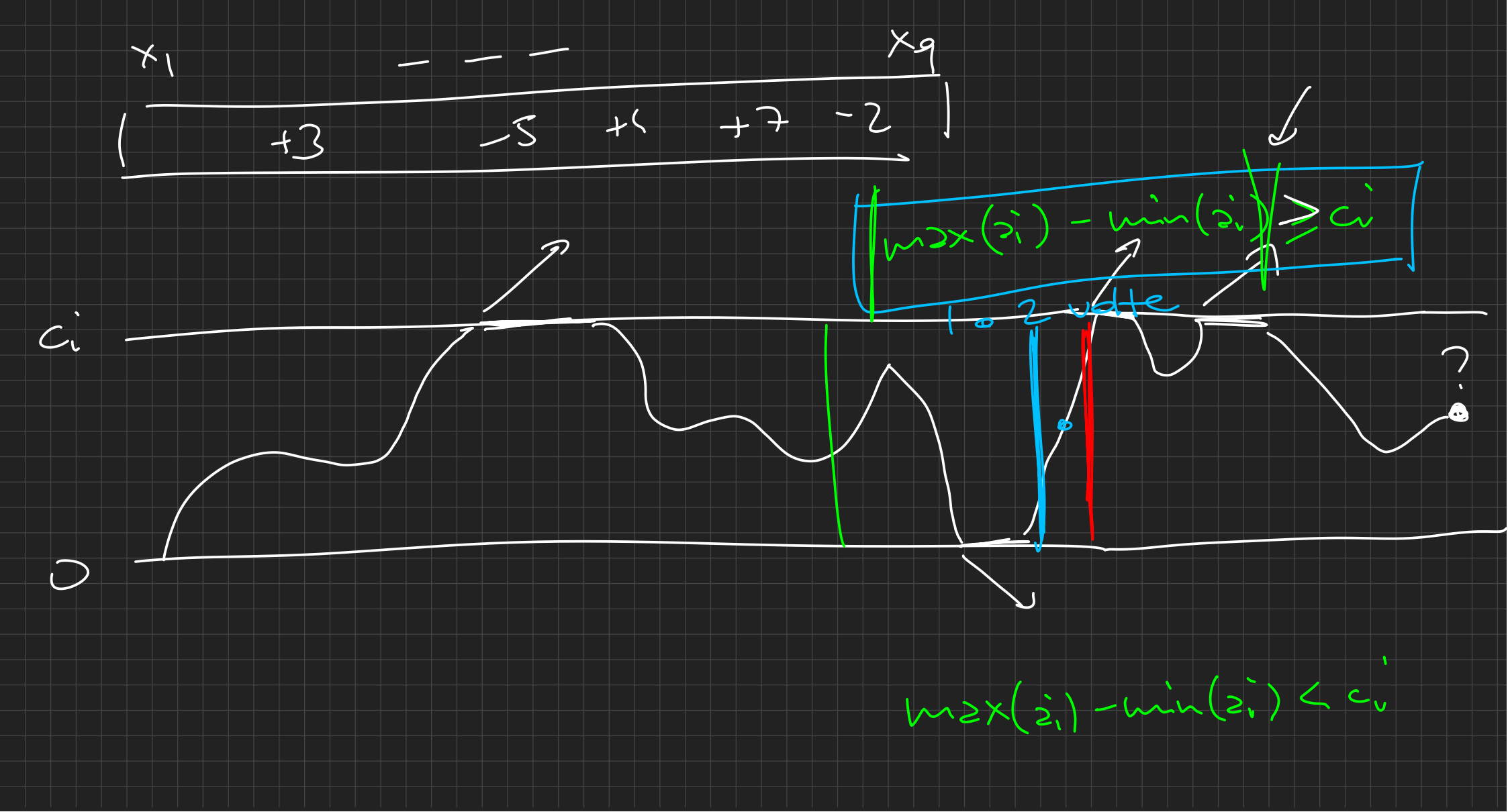

+3 −5 +4
+3
−5
+4
~
+x1
+x3
+x1
+x2
+x3
+x2
+x3
- - -

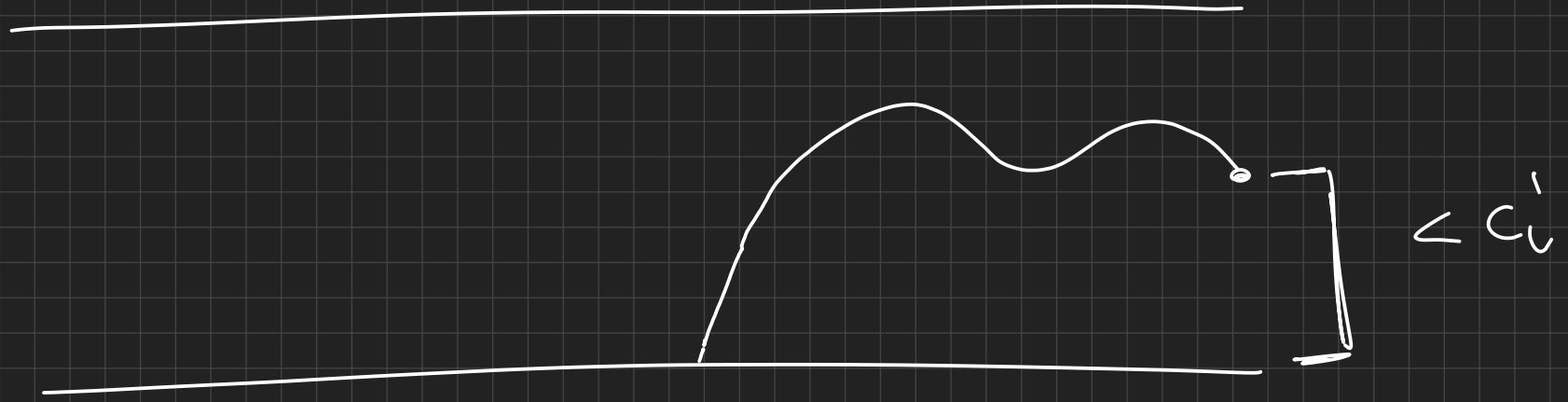
- attiva query
- disattiva query
- trova il risultato

$\Big] \approx$

↓

ho un el. singolo, eseguo le query attive, qual è il valore massimo?


x1
x9
+3
-5
+7
-2
max(zi) - min(zi) ≥ ci
ci
0
1 2 vette
?
max(zi) - min(zi) < ci


< c̀