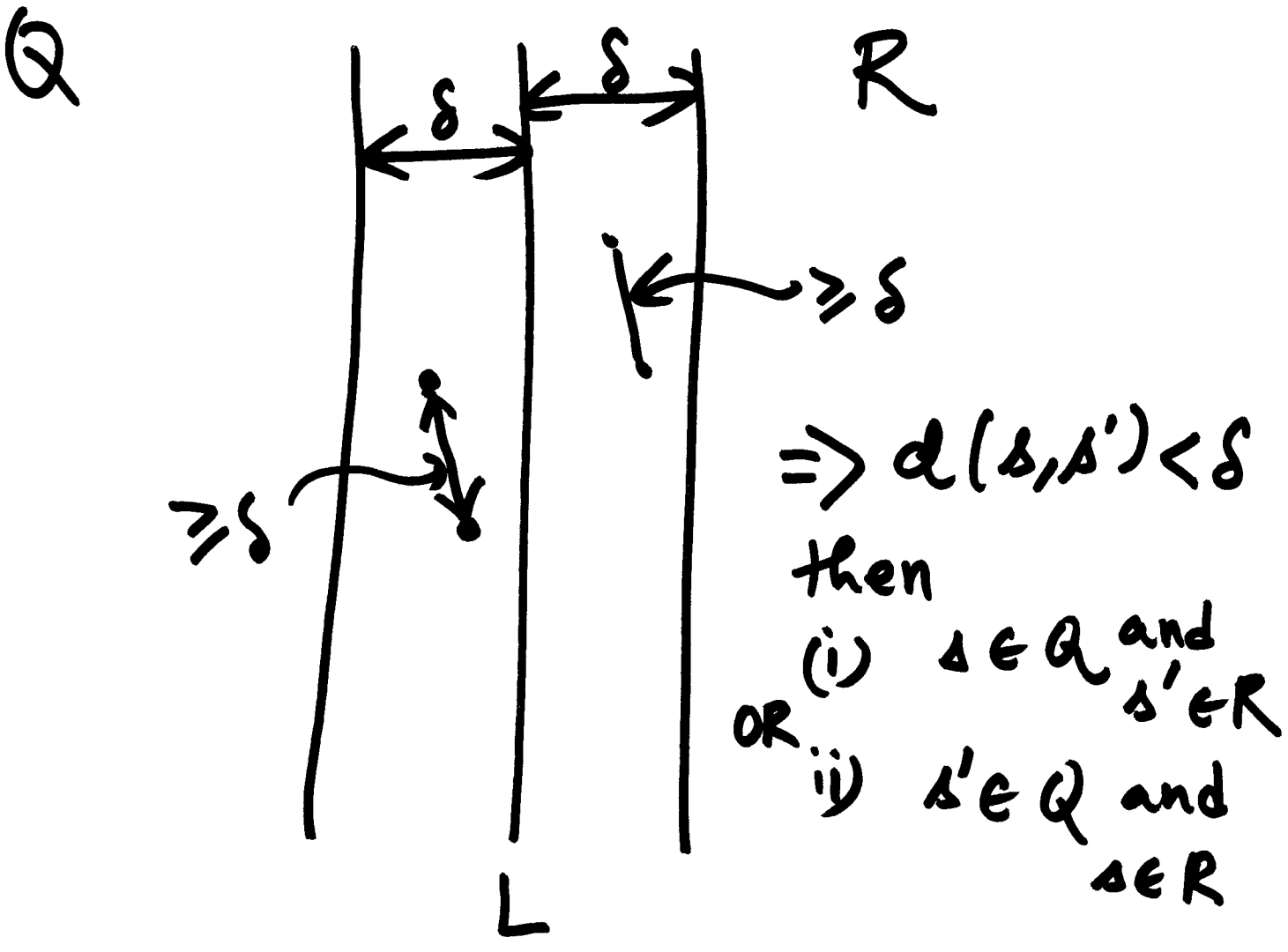
NOVEMBER 18, 2011

KICKASS LEMMA:

If $\exists\ s \neq s' \in S$ s.t $d(s,s') < \delta$

$\Rightarrow$ s and s' are within 15 positions of each other in S



$\Rightarrow d(s,s') < \delta$

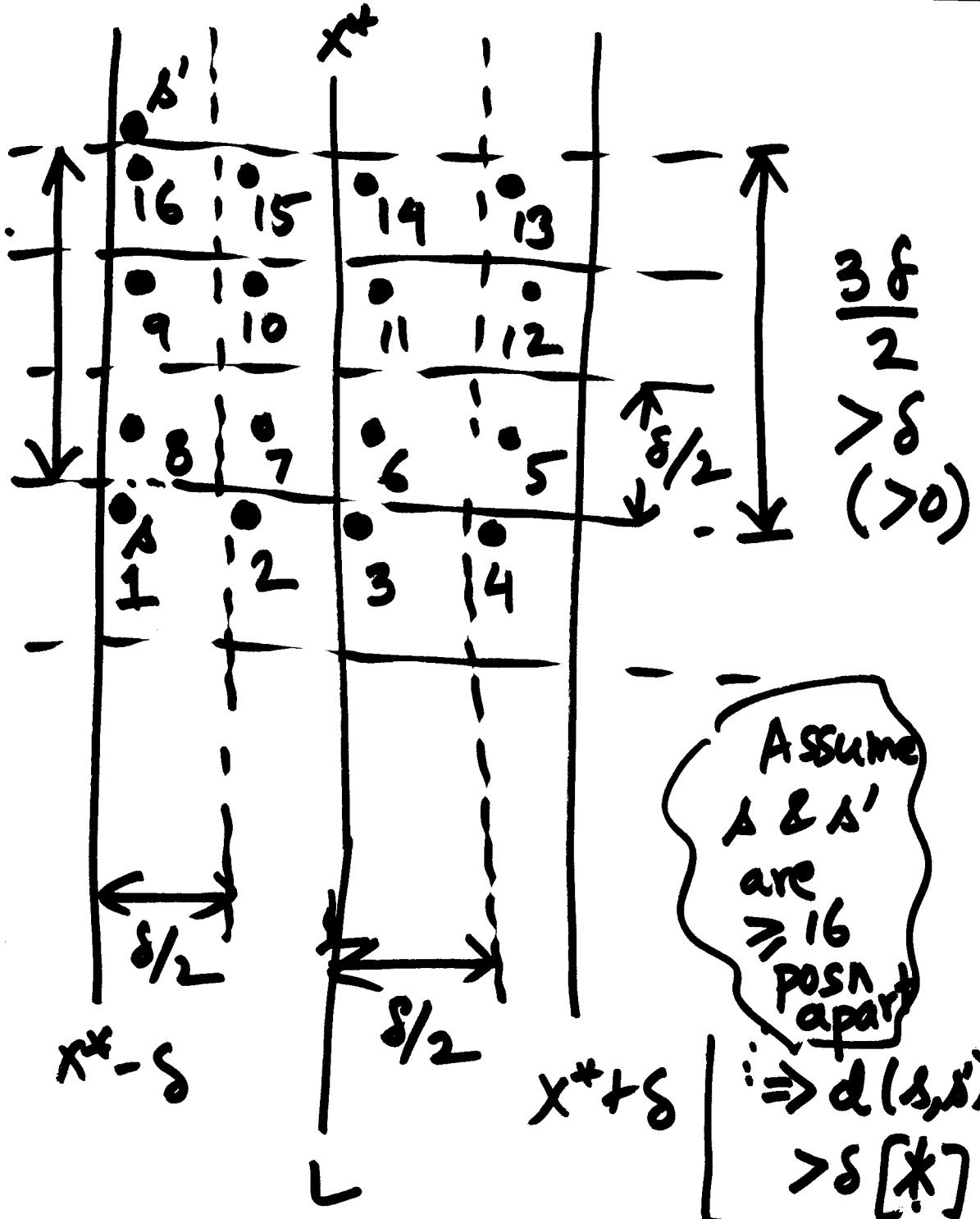
then

(i) $s \in Q$ and $s' \in R$

OR

(ii) $s' \in Q$ and $s \in R$

Pf:



s' is not among 2-16

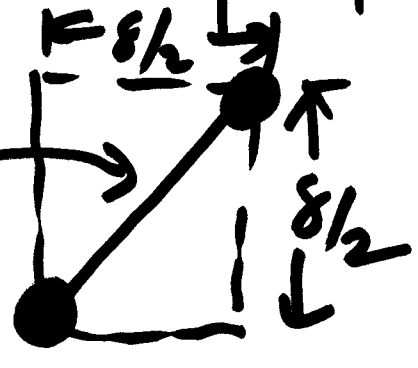
$\frac{\delta}{\sqrt{2}} = \frac{\delta}{\sqrt{2}} < \delta$

contradicts def. of δ

Assume s & s' are ≥ 16 posn apart

$\therefore \Rightarrow d(s,s') > \delta$ [*]

Claim: Each square has at most one point in it.



dist $= \sqrt{\frac{\delta^2}{4} + \frac{\delta^2}{4}}$

$= \sqrt{\frac{\delta^2}{2}}$

farthest at ends of a diagonal.

WEIGHTED INTERVAL SCHEDULING

Input: n intervals $i \to [s_i, f_i)$

Also $v_i \geq 0$

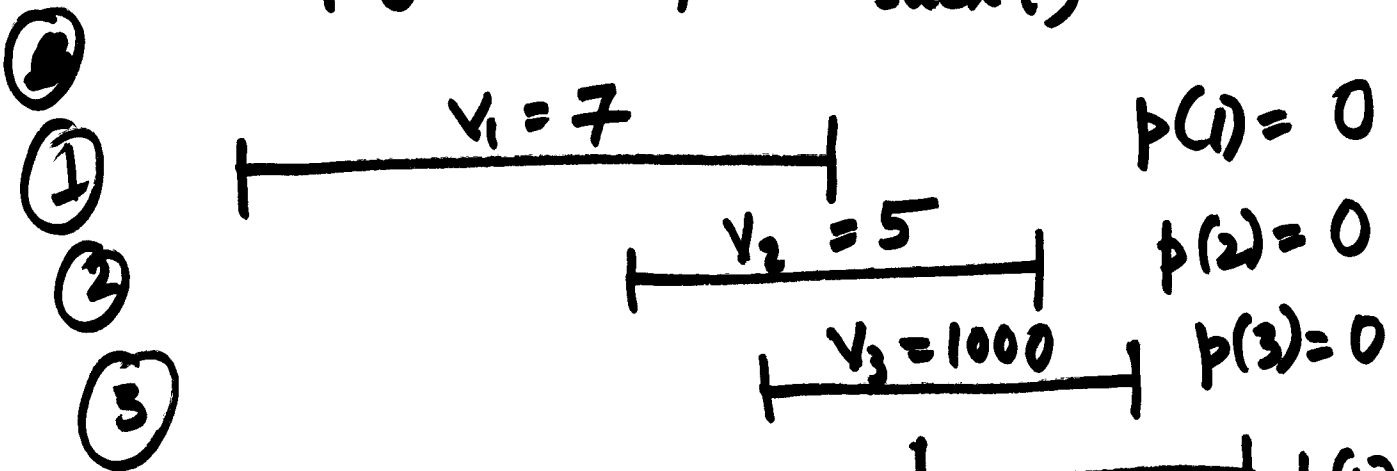
Output: A schedule $S[n]$ (no conflicts)

to max $\sum_{i \in S} v_i$

Assume: $f_1 \leq f_2 \leq \dots \leq f_n$

Def: $p(j)$ largest $i < j$ s.t. i & j have no conflict.

($p(j) = 0$ if no such i)



$O \rightarrow$ optimal soln.

Case 1: $n \in O$

What about $p(n)+1, \ldots, n-1$ have conflict with n.

none in O! $\Leftarrow$

Case 2: $n \notin O$

O is opt for $\{1, \ldots, n-1\}$