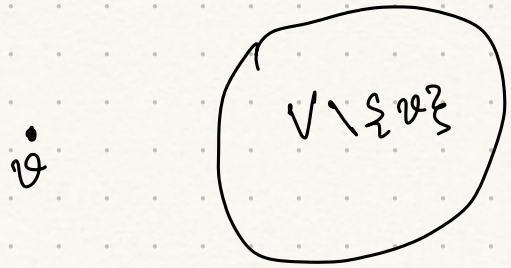
Review (contd).

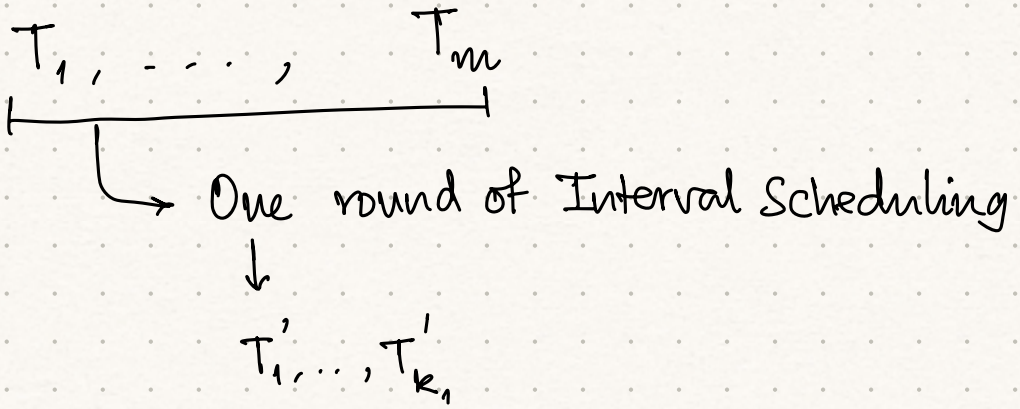
TO READ:
SOLVED PROBLEMS OF GREEDY in KT.

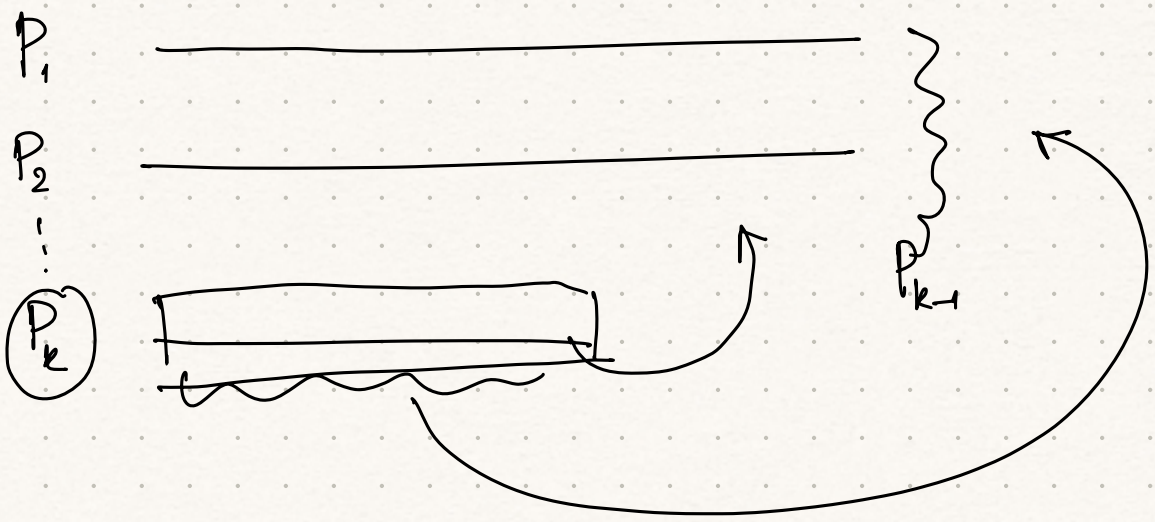
Qn: If e is a min wt edge incident on a vertex v then argue that $e \in MST$. (Assume distinct wts)

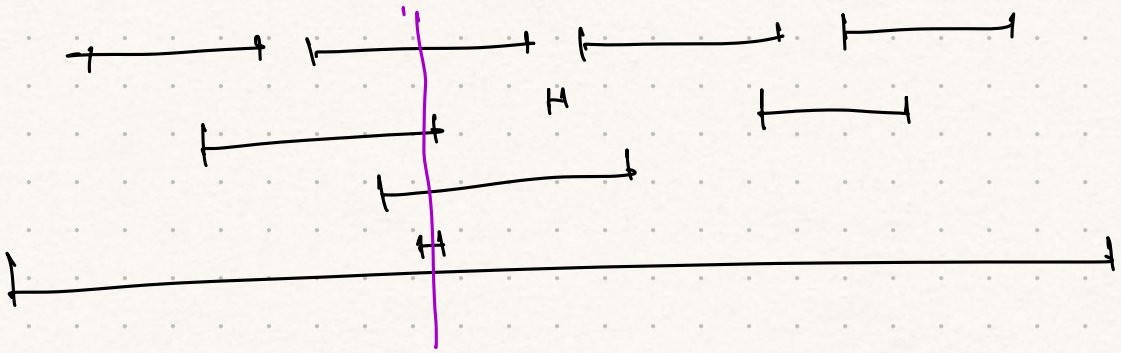


Qn: Suppose a railway station has k platforms. We are given a schedule of trains and we would like to minimize the no. of platforms used.

How can we do that.







Closest Pair of Points

$P_1, \ldots, P_n \in \mathbb{R}^2$

Want to find a closest pair of points.

$(x_1, y_1), \ldots, (x_n, y_n)$

- Sort the points based on x-values
- Put a seperator at the median x-value.
- Compute the closest pair on each side recursively.

$\delta_L \leftarrow (x'_L, y'_L) - (x''_L, y''_L)$

$\delta_R \leftarrow (x'_R, y'_R) - (x''_R, y''_R)$

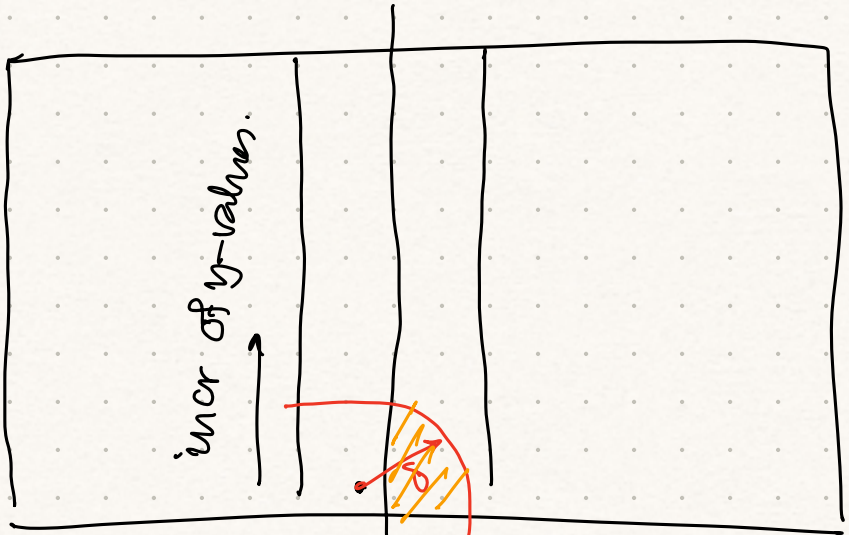
$\delta = \min\{\delta_L, \delta_R\}$.

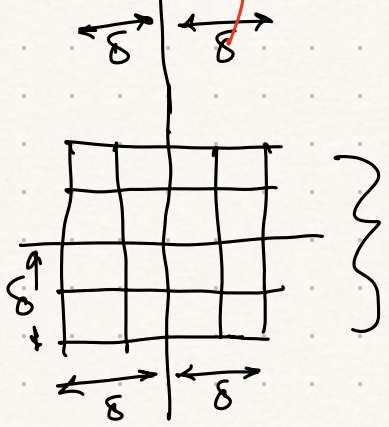
$n \sim n'$

$T(n) = T(\lfloor \frac{n}{2} \rfloor) + T(\lceil \frac{n}{2} \rceil) + \sim$

$T(n') \leq T(\frac{n'}{2}) + T(\frac{n'}{2}) + \sim$

- Consider the δ-band on either side of the seperator.
- New task Find pairs of points s.t they are not on same side of sep. and have dist $< \delta$.
- Consider only those points that lie in this band.





In this grid there are at most 16 points and at most one point per $\frac{\delta}{2} \times \frac{\delta}{2}$ square.