

$R$  is an axis parallel rectangle

Prob 1 : What is the number of points within  $R$

Prob 2 : Report the points within  $R$

Given a set  $P$  of points in the plane, build a data structure to solve the above problems.

Suppose each point has two attributes, age and salary  
 $x_i$ : age       $y_i$ : salary

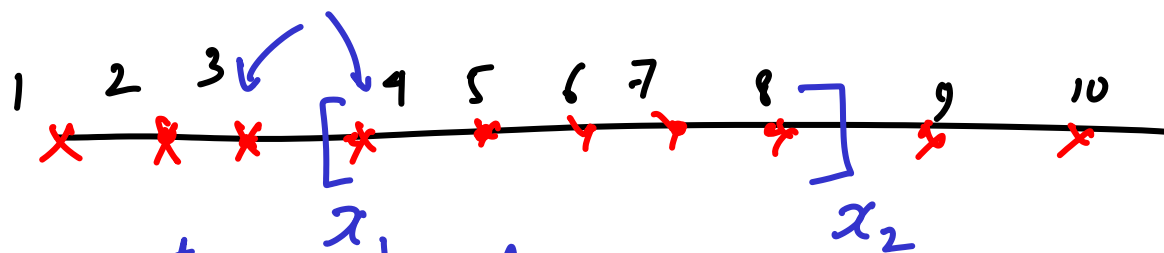
A rectangle is a cartesian product of intervals  $[x_1, x_2] \times [y_1, y_2]$

Prob 1: Can we achieve  $O(\log n)$ ?

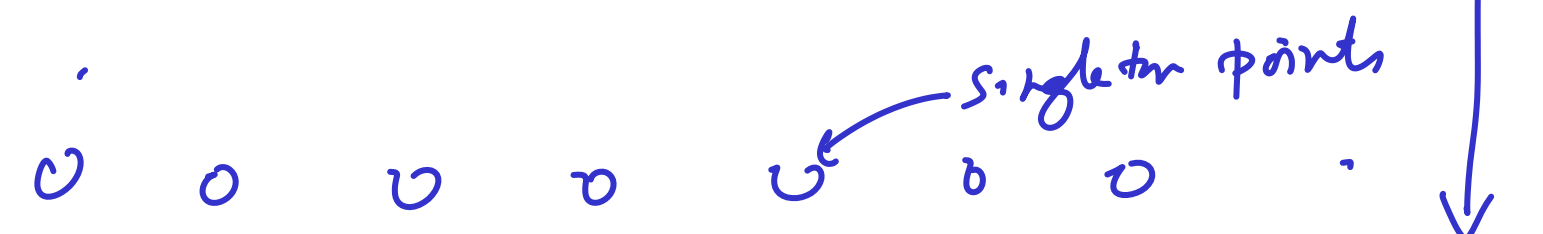
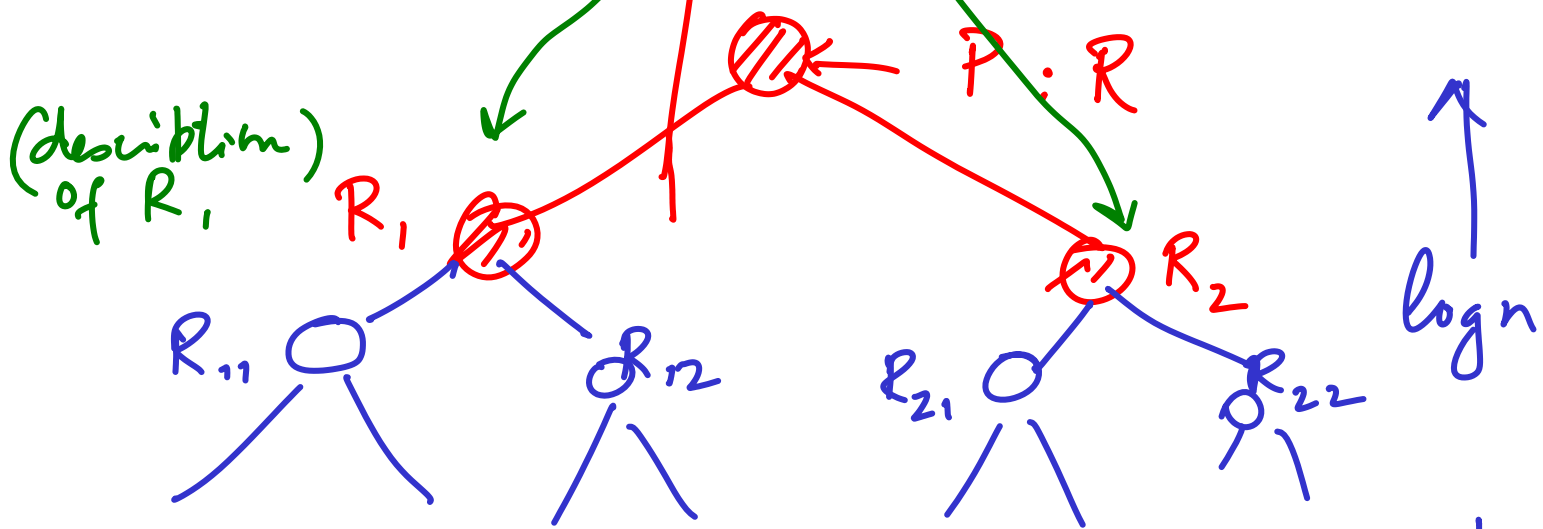
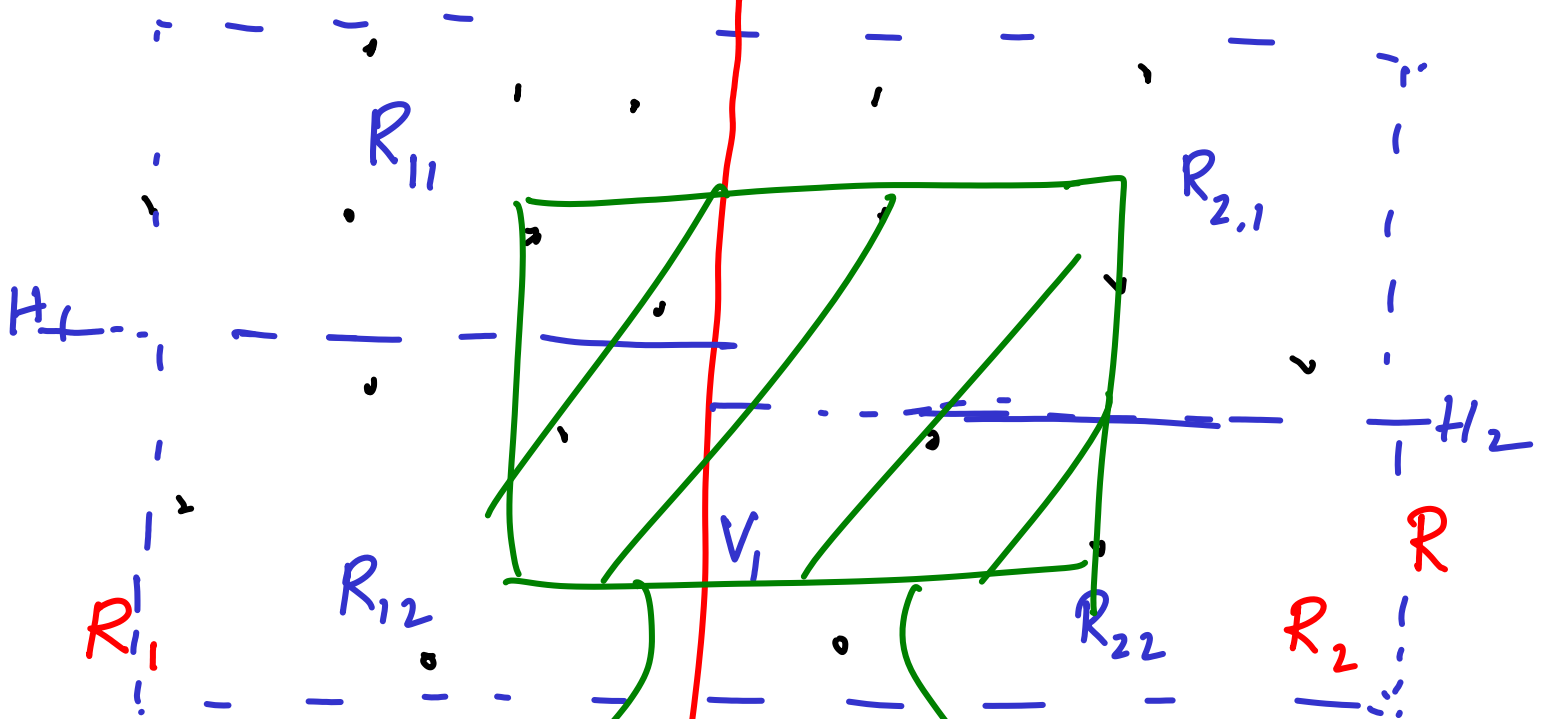
Prob 2:  $O(\log n + q)$   
 fixed  $\log n$       size  $q$  answer

Space:  $O(n)$

Pre processing Time: ?  $O(n \log n)$



Store points as sorted array



(description)  
of  $R_1$

singletor points

logn

Space is  $O(n)$

What is the query-time?

→ Query time is related to the no. of subrectangles created by the query

→ Alternately no. of nodes visited by the query process