⑤

Implement the convex hull algorithm.

① What is convex hull?

A convex set 's' is one which is defined thus: Taking any two points in the set, the line drawn between them has to lie entirely within the set. That is, all points on the line have to be part of set 's'. This has to be true for all possible combinations of two points in the set and the line drawn between them.

Convex Hull -

A convex Hull is defined as the smallest convex polygon/set of points such that all points in a given set A lie inside the polygon. This polygon (set of points) is called convex Hull of A or c(A).

Example
Given points are = { (0,3), (1,1), (2,2), (4,4), (0,0), (1,2), (3,1), (3,3) }
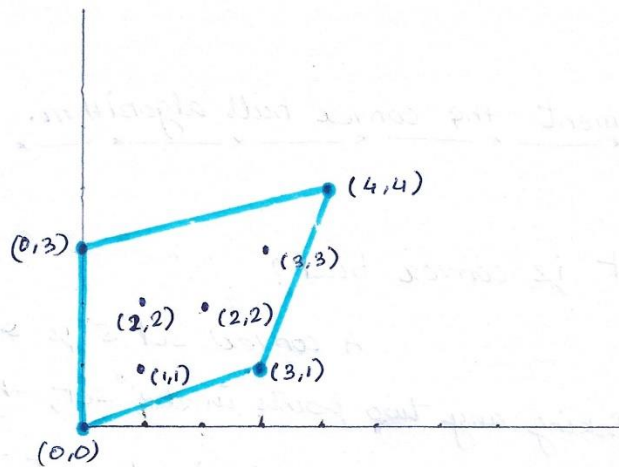
As we know that convex-hull is the smallest convex set that contains a given set of points

From our above graph we can see that the convex hull containing all its points is

$$= \{ (0,0), (3,1), (4,4) (0,3) \}$$

Time complexity:

x —— x —— x —— x

Since we are using divide & conquer technique so The merging of the left and right convex hull takes $O(n)$ time and as we are dividing the points in to two equal parts so the time complexity is

$$O(n \log n)$$