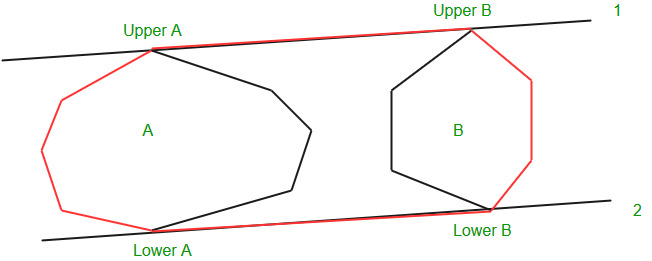
Prompt:

Design a divide-and-conquer algorithm for the convex hull problem by doing:

a) Let P1 and P2 be two disjoint convex polygons with n vertices in total. Give an O(n) time algorithm that computes the convex hull of P1 ∪ P2.

b) Use the algorithm from part (a) to develop an O(nlogn) time divide-and-conquer algorithm to compute the convex hull of a set of n points in the plane.



A.) Imagining that there are two disjoint convex poloygons that when connected can form the convex hull. Together they have N verticies. These polygons can be seen as the convex hull of the left and right points.

P1 = points on the left of the midpoint

P2 = points on the right of the midpoint

Pseudo Code:

LowerTangent()

L <- line joining the rightmost point of a and leftmost point of b

While(L crosses P1 or P2)

{

While (L crosses b)

L <- L’: point on B moves down

While(L crosses a)

L<-L’ : point on A moves down

UpperTangent()

U <- line joining the rightmost point of a and leftmost point of b

While(U crosses P1 or P2)

{

While (U crosses b)

U <- U’: point on B moves up

While(L crosses a)

U<-U’ : point on A moves up

Orientation(

To take a look at

https://iq.opengenus.org/divide-and-conquer-convex-hull/