JOINING POINTS (Expected solution)

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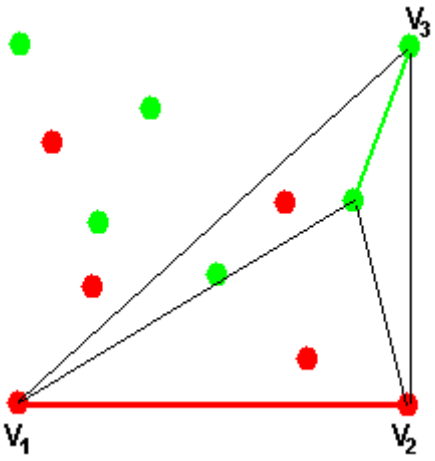
OPTIMAL SOLUTION: Take any triangle which has vertices of different colors. V_1 and V_2 are colored with color *c* while V_3 is colored with the color *c'*. Join the vertices V_1 and V_2 and proceed as follows:

- If there are no points inside of the triangle then you are finished with that triangle.
- If all the points that lie inside the triangle are of the same color, then join them to any of the vertices of the triangle which has that color. After that, you're finished with that triangle.
- If the points inside the triangle are of different colors then choose one of those points whose color is *c'* and join it with the vertex V_3 of the triangle. This operation will divide your triangle into three new triangles that can be processed recursively in the same way as the first.

If you choose a point closer to the median then the division will assure you an *O(n log n)* algorithm. Nevertheless for the average case randomly picking one of the points will give you an *O(n log n)* running time.

Look at the figure below:



Since the board is always a square with the top corners colored green and the bottom corners colored red. The task can be always solved by creating two triangles dividing the square by its diagonal.

Test run #	Value	*green points*	*red points*
1	8	3	3
2	9	5	3
3	9	6	4
4	9	3	6
5	5	3	225
6	6	866	225
7	6	59	3345
8	6	12931	16
9	6	5	3345
10	6	50000	3
11	6	3	50000
12	6	12931	3345
13	6	50000	225
14	6	866	50000
15	6	50000	50000