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Cpts450

HW4

2. Since the string size becomes larger as the iteration goes on, use summation for the complexity. It needs O() multiplied by . Thus, the complexity is .

3. Since we split the string into two parts,

For recursion call and processing multiplication.

And since the recursion works the same for the partied strings,

4. Let there are unit sectors, so the box is now divided in multiple boxes.

From the box1 to the box, search for planes that are inside of the neighboring boxes. The neighboring box must be in rage of c from the iterating unit box.

If there are more than one airplanes in a unit box, set the closest distance as c. If not, look for the closest airplane in the neighboring box, and set the distance between airplanes as c. As iteration goes on, c is adjusted.

Let x be number of boxes in range of c. For all boxes, x scan is needed.

Thus,

5. Let (a, b) as coordinate of each string: a and b mean number of a in the string and number of b in the string respectively. This will need complexity since n strings of m length were scanned for coordinating.

Now perform closestpair algorithm that has complexity of when all points are known.

Since we want to find the difference of distinct pairs, we assume m>log(n).

Thus, the complexity is O(nm).