Question 3
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First we sort the list A, it will take O(nlogn) complexity since the length of A is n

Then for each pairs of Li and Ui, we can binary search to find the first index that greater or equals to Li and the first index that greater than Ui. And binary search takes O(logn) Complexity

And also if the binary search hit Li, we have to ensure the preceding element is smaller than Li, otherwise we have to do another binary search to find the first index that greater equals to Li with no preceding element is equals to Li, also same applies if binary search hit Ui

So Its total complexity is O(nlogn)+O(logn) = O(nlogn)