Birla Institute of Technology and Science-Pilani, Hyderabad Campus
First Semester 2020-2021
Lab Sheet-2
CS G526: Advanced Algorithms and Complexity
Date: 11/9/20

General Instructions: Argue logically. Write it in a manner that explains your logic very clearly. Do not miss steps in between.

Problem-1:[20 pts] Two strings S and T are anagrams if one can be transformed to another by rearranging the characters in some way, without adding a new character and without deleting any existing character. Suppose, you are given a set of strings. output the size of the largest subset of the given set where no two strings are anagrams. Can you please give an algorithm which takes $O(n)$ time where n is the number of strings in the set?

Example: Suppose the given set is {abb, bab, bba, ac}. Then the output of your program should be 2 because the largest such a subset is {abb, ac}.

Problem-2:[30 pts] Given a list of n integers, output top-k frequent elements in the list. Explain your data structure and analyze the time complexity. Can you do it in $O(n + k \log n)$ time?