COL106 Lab Week 4 Questions

Problem 1: H Index

The h-index is defined as the maximum value of h such that the given researcher has published at least *h* papers that have each been cited at least *h* times.

Given an array of integers “citations” where citations[i] is the number of citations a researcher received for their i-th paper, return the researcher's h-index.

You can submit and check your code here.

Problem 2: No of Inversions in an Array

For an array arr, an inversion is defined as a pair of indices i,j such that:

- i < j and
- arr[i] > arr[j]

Design an algorithm to count the number of inversions in an array in O(nlogn) time.

You can submit and check your code here.

Problem 3: Largest Word Count

You are given two string arrays messages and senders, where messages[i] is a message sent by senders[i].

A *message* is a list of words that are separated by a single space with no leading or trailing spaces. The word count of a sender is the total number of words sent by the sender. Note that a sender may send more than one message.

Return the sender with the largest word count. If there is more than one sender with the largest word count, return the one with the lexicographically largest name.

You can submit and check your code here.

Challenge Problem: Maximum Points on the same Line

Given an array of points where points[i] = [xi, yi] represents a point on the X-Y plane, return the maximum number of points that lie on the same straight line.

You can submit and check your code here.