भारतीय सूचना प्रौद्योगिकी संस्थान गुवाहाटी

INDIAN INSTITUTE OF INFORMATION TECHNOLOGY GUWAHATI

Data Structure Lab, B.Tech 2nd Semester

Instructions

1. After completion, you can share the files in mail to g1.ds.lab.iiitg@gmail.com.
2. Deadline to submit is 11th July 2022.
3. The first two questions you have to submit. The rest are practice questions.

Assignment -10

1. Given 2 arrays A and B each with n elements. Give an algorithm for finding smallest n pairs (A[i],B[j]). [Use Heapify Algorithm]

   Hint: Heapify A and B. Then keep on deleting the elements from both the heaps.

2. Given two arrays of unordered numbers, check whether both arrays have the same set of numbers?

   Example: Let us assume that two given arrays are A and B. A simple solution to the given problem is: for each element of A, check whether that element is in B or not. A problem arises with this approach if there are duplicates. For example consider the following inputs: A = 2,5,6,8,10,2,2 B = 2,5,5,8,10,5,6

   but, here frequency of the elements are not same. Hence it should return false.

   Hint: Use the concept of hashing to solve this.

Practice Questions

(a) Implement the following collision resolution techniques for hashing for the following set of elements: 13,12,15,16,2,7,18,19. Use the hash Function: x mod 10. Consider the table has 10 busckets from 0 to 9.

   i. Linear Probing
   ii. Quadratic Probing

   Report which one is giving maximum number of collisions.

(b) Implement the following graph traversals

   i. BFS
   ii. DFS