

CS213/293 Data Structure and Algorithms 2023

IITB India

Quiz 1

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Compile date: 2023-08-21

Duration : 45 minutes

Total: 30 marks

1. (3 marks) Mark the following statements True / False. Also provide justification.
 - (a) Let α be the load factor of a hash table with chaining, the average search time in the hash table is $O(\alpha)$ if $\alpha > 1$.
 - (b) A unique pointer can be used to provide a non-owning reference to an object that is managed by a shared pointer
 - (c) Stack can be implemented using doubly-linked list as well as singly-linked list
2. (6 marks) What is the probability for the 3rd insertion to have exactly two-collisions while using linear probing in the hash table.
3. (6 marks) Prove/Disprove: If no node in a binary tree has a single child, $|\text{leaves}| = 1 + |\text{internal nodes}|$.
4. (6 marks) Give an algorithm for walking a tree such that nodes are visited in the order of their level. Two nodes at the same level can visit in any order.
5. (9 marks) Write a time and space efficient algorithm to merge K sorted-linked list in sorted order, each containing same no of elements?