Dsa Tutorial

17-22 February 2025

1 Heaps

1. Heap property and how it's implemented in Binary Tree and Arrays.
2. How insertion and extraction are implemented preserving the heap property. What are the time complexities for each of the operations.
3. Apply 'heapify' on array. What is the time complexity? Implement heapsort as a series of extractions on this array. Time complexity of this sorting algorithm? Is this a stable sort? Is time complexity reduced on partially (mostly) sorted input arrays?

2 Problems

1. Given an input array, find the K most common elements in the array. Give output in decreasing order of 'number of occurrences'.
2. Merge K sorted linked lists into a single linked list.
3. (If time permits / as homework) Use heaps to generate prefix codes for characters in a string (Huffman coding).