

Design and Analysis of Algorithms

Question #1:

Give an $O(n \log k)$ -time algorithm to merge k sorted lists to produce one sorted list, where n is the total number of elements in all the input lists.

Question #2:

Show the hash table after you insert the keys 5, 28, 19, 15, 20, 33, 12, 17, 10. Show the same hash table after collisions are resolved by chaining. Moreover, show the hash table after inserting keys using open addressing. Let the table have 9 slots and let the hash function be $h(k) = k \bmod 9$.

Question #3:

Given a connected undirected graph $G = (V, E)$, design an $O(V + E)$ -time algorithm to compute a path in G that traverses each edge in E exactly once in each direction.