

CS201c Tutorial (Skip-lists)

1. Augment the skip-list data structure so that the following operations can be done in expected $O(\log(n))$ time:

- finding the k -th smallest element
- counting the number of elements which lie in a given interval $[a, b]$.

2. Given a skip-list S and a key k , show how to split S into two skip-lists S_1 and S_2 such that S_1 contains all keys in S less than or equal to k , and S_2 contains all keys in S greater than k . The expected time for the split operation should be $O(\log(n))$. [Note. The original skip-list will no longer exist after the split operation.]

Can you also implement the split operation on the augmented skip-list from Question 1 above?