CS 240: Data Structures and Data Management **Spring 2020**

Tutorial 5: June 22

1. Insert the numbers 12, 11, 13, 10, 20 into an empty skip-list using the coin flips HHTHTHTTHHHT.

2. Consider a skip-list containing n elements. Show that the expected runtime for a search operation is in $O(\log n)$. You can use the fact that a skip-list with n elements has expected height in $O(\log n)$.

3. In this problem, we will explore an alternate implementation of a min-ordered priority queue. That is, implement a data structure such that inserting a new element into the priority queue takes $O(\log n)$ expected time, while deleting the minimum element from the priority queue takes $O(1)$ expected time.

4. Consider a linked list with the keys $k_1, k_2, \ldots, k_n$ in that order. Give a sequence of n searches such that the Move-To-Front heurstic uses $O(n)$ comparisons while the Transpose heuristic uses $\Omega(n^2)$ comparisons.