CMSC 341 Data Structures
Skiplist Review

October 26, 2010

1. The expected asymptotic time for Skiplist operations is $O(lg\, n)$. There is a non-zero probability that the performance could be as bad as $O(n)$. Draw a 7-element Skiplist with max node size of 4 that would have such poor performance.

2. What maximum node size is appropriate for a Skiplist suitable for storing 65,535 elements and with associate probability $\frac{1}{4}$?

3. Given the drawing of a Skiplist, indicate all comparisons done in searching for a particular element.

4. Given a Skiplist with with probability p and maximum node size M that contains N nodes, show the expected distribution of node sizes (how many nodes of each size).

5. The following perfect Skiplist is valid for $p = \frac{1}{2}$. Draw and equivalent figure for $p = \frac{1}{4}$. What distribution of nodes (how many nodes of each size) do you expect in a long list of this type?