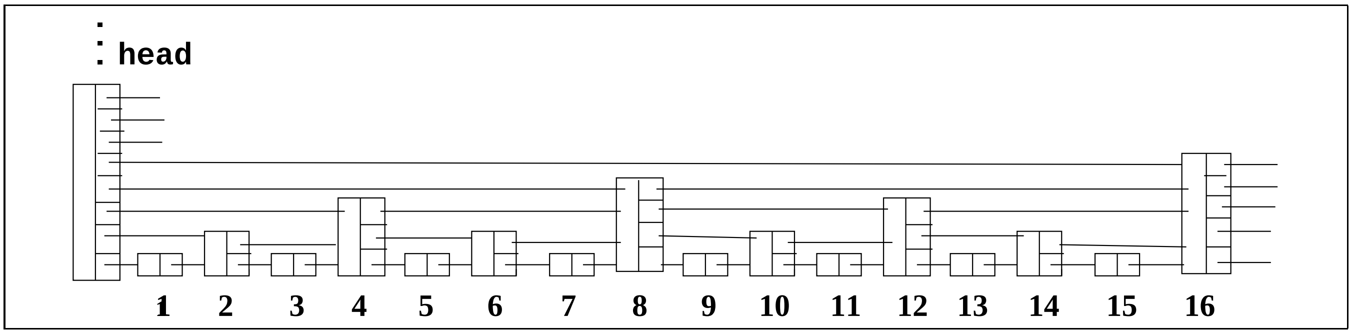
These are some review questions to test your understanding of the material. Some of these questions may appear on an exam.

1 Skip List

1.1 The following perfect skip-list is valid for $p = \frac{1}{2}$. Draw an equivalent figure for $p = \frac{1}{4}$. What distribution of node levels do you expect in a long list of this type?



1.2 The expected asymptotic time performance 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 `int` data values, that would have such poor performance. Use a maximum node level of 4.

1.3 What maximum node size is appropriate for a `SkipList` suitable for storing up to 65,536 elements and with associated probability $\frac{1}{4}$.

1.4 Write pseudo-code for the `find(const Comparable &)` operation in a skip-list. Return the element found if it's in the list, `ITEM_NOT_FOUND` otherwise.

1.5 Given a skip list (a drawing of one), indicate all the comparisons done in searching for a particular element.

1.6 Given a skip list with probability p and maximum node size M that contains N nodes. Show the expected distribution of node sizes (*i.e.*, the number of nodes at each size).