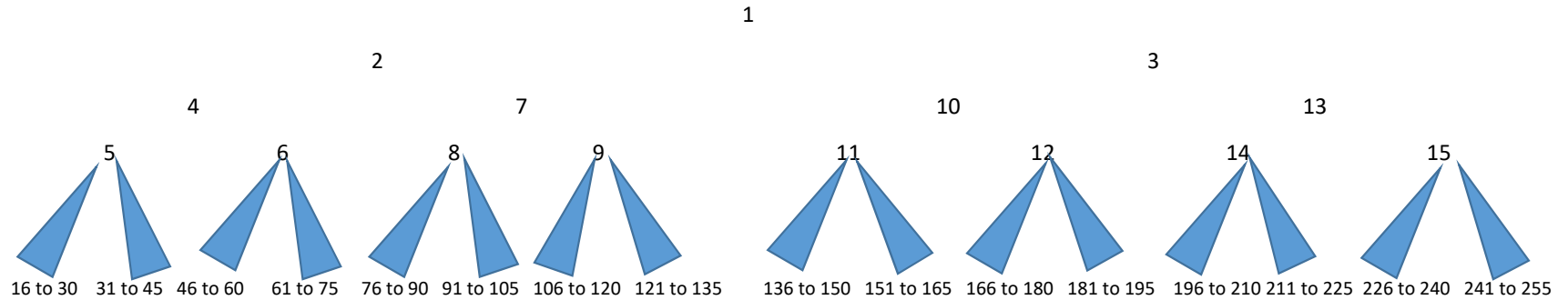
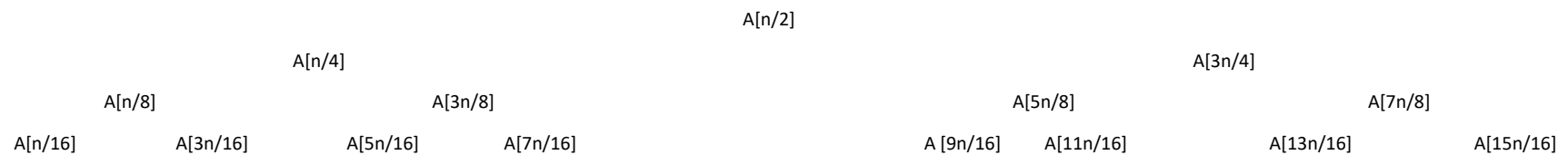


Van Emde Boas layout of a balanced binary tree of size 255



The top of \sqrt{n} nodes of the tree are in the first \sqrt{n} positions of an array, each of the remaining \sqrt{n} subtrees each of size \sqrt{n} is stored contiguously, and consecutively. The structures are then stored in a recursive manner in their own spaces. So 1,2 and 3 are in a perfectly balanced tree of size 3; 16,17 and 18 form the top 3 nodes of the 16 to 30 range.

If an actual cache line were of size 8, an access to node 1 (the root) would give the first 8 locations ... that is 4 levels in part of the tree, but only 2 in the rest. It still allows at least 2 comparisons in a binary search. If the cache line contained 32 elements, we would get at least 4 comparisons



The elements in the top of the tree, i.e. the first 15 locations, are equally spaced in the original sorted array, and had positions as indicated.