CSE332 Week 4 Section Worksheet

1. For the 2nd case of AVL delete (shown below), argue why X & U’s heights **must** both be h before the deletion. Ex: if X had a height of h+1 instead of h to begin with, this wouldn’t be a case 2 deletion – we’d do a case 1 instead. Consider for X=h-1, U=h-1, U=h+1.

If X=h-1 to begin with, we’d already have an imbalance at node ‘b’, so it wasn’t a valid AVL tree to start with.

If X=h+1 (not listed above; just given here for illustration), this would be a case 1 deletion, not a case 2.

If U=h-1, c’s height will be h, and b’s height h+1, so the deletion won’t result in an imbalance.

If U=h+1, there will already be an imbalance at node ‘c’.

And, as pointed out by a student in section, there is one more case: when X=h-1 AND U=h-1; then there won’t be an imbalance after the deletion.

1. For the splay tree below, splay about 15. Then, using the original splay tree – not the updated one – splay about 40.

Splay about 15:

Splay the original about 40:

1. Starting with an initially empty splay tree, perform the following operations in order:

Here the tree is only shown at some stages.

1. Insert 2, 4, 6, 0 & 1
2. Insert 5
3. Splay about 0
4. Splay about 6
5. Splay about 2
6. Delete 5