

1. We would not use an AVL tree or a skip list. Since we need to look up students frequently, the  $O(\log n)$  lookup time for these two structures can be costly; hash tables with constant lookup time is preferred. In addition, sorting by last names (value) requires traversing the entire structure so all three structures have similar costs for this task and is not a factor in choosing the best data structure.

2. We would not use an AVL tree. Since we need to search for keys in sequential order, using an AVL tree means that we might need to traverse between the levels of the tree and possibly visiting a node many times which wastes time. It is not costly in hash tables due to constant lookup times and looking up sequential keys in skip lists are simply traversing the bottom level linked list which is also cheap.

3. Hash tables are disqualified since the keys are not ordered and there is no way to find similar keys without searching the entire table. AVL trees and skip lists are good for this task as we can simply find the child nodes in AVL tree or neighboring nodes in a skip list.