Data Structures Project 1:
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2. (a) Worst case run-time (Big-Oh notation) is O(N) run-time (linear). This can be seen from the for-loop in the find_gt function. Adding the rest of the steps of inserting the node is just constant time, so simplifying the O(N) notation by keeping only the highest power in the expression leaves us with N.

2. (b) In building the entire adjacency list, the run-time should be O(N^2). This is because the O(N) run-time of inserting the node into the adjacency list is repeated for each element of the vector (effectively N elements). This is realized with the insertion (which is in essence a for-loop, thereby O(N) run-time) inside a while loop, which is similar to having a nested for-loop structure. This similarity of a nested for-loop and a for-loop encapsulated inside of a while loop lends itself to sharing the same run-time of O(N^2).

2. (c) The run-times of insertion and building the adjacency list with a vector of vectors should be the same as with a vector of linked lists. In the case of insertion, it takes O(N) runtime to insert a node into a vector. In building an entire adjacency list, the while loop outside the insertion (which contains a for-loop) leads to N times N operations, or O(N^2) run-time.