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CS32 hw4

2, The insert function needs to check and sort the element before adding into the list. Therefore, it needs to have overloaded the “<” operator for comparison. However, when trying to use insert with Coord class, there is no overloaded “<” for the comparison of this class. Therefore, it would have complier error because the insert() function has no way to compare the Coord class.

3.b, Only having one-parameter listAll cannot solve this problem by recursion. The recursive function would only read its menuItem. It must require another parameter which can be able to pass down the menus above to read.

4.a, O(N^3). There are 3 for loops and each for loop would take N step. The for loop is nested inside one another. Therefore, we need N\*N\*N step to complete which is O(N^3).

4.b, O(N^3) The first for loop take N step, while the second nested inside for loop takes i steps. Since the i would also become N for the last loop. With the third nested inside loop also takes N step. We still consider that it needs N\*N\*N steps to completek, which is O(N^3).

5.a, The worse case is O(N^2). When the result is a distinct set, and s2 is not equal to s1 totally. Then, it needs to run the for loop [sp->size()] time(N). insider the for loop, it has the get() function. Get() function also runs N time for the worse case. Therefore, it would be O(N^2) for this case.

5.b, O (N log N). Other cases such as for or while and for loop, their time complexity is O(N). Therefore, the time complexity should be the largest one which is O(N log N) for the sort function.

5.c, O(N). The first while runs N steps because the set1 and set2 have N element. The insertBefore() is O(1). Hence, the while is O(N). Similarly, the for loop also have O(N). Because the while and for loop are separated. We only consider O(N) even though it is N + N.