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Homework 4 Answers

2. The call to Map<Coord, int>::insert causes at least one compiler error because the Coord class fails to define a comparison operator (< or >). When attempting to insert new pairs into the Map, the Map does not know how to order the Coord items because of the fact that it does not have a comparison operator defined.

3b. If I only had a one parameter listAll, I would not be able to solve this problem because I only have access to the current Class’s string. Once I recursively call the function, I need to be able to pass in the name information of the above base class so that once I reach a child that has no derived classes, I should print the full hierarchy. Only one parameter does not help me solve this problem.

4a. O(n^3). The reason why it is cubed is because it is a triple nested for loop, so every time we iterate through N in each of the for loops, we have to multiple them together.

4b. O(n^3). This still remains cubed. For the second for loop, even though j runs while it is < i, the big O for that portion of the problem is O(n/2). If we multiply all the nested for loops together, we get O((n^3)/2) and we can get rid of the ½ coefficient. This leaves us with O(n^3).

5. O(n^2). The important thing to know for this problem is that we are not dealing with the actual Map class given to us by the STL library. The outer loop will always run n times and inside the loop we have several functions that perform n times. This means that we will have something like n\*(n +n +n…). No matter how many n’s there are inside the for loop, the coefficient will be dropped, so when we multiply the n’s together we get big O(n^2).