Raymond Lin

Smallberg

CS32 - Data Structures and Algorithms

6 March, 2018

Homework 4

2. It will cause a compile error, because the != operator is not defined for the Coord class. You must define a comparison operator for != that computes the equality of two parameters of Coord type.

3b. There is no way to retrieve the names of a particular class’s base classes.

4a. O(N^3). There are three for loops which are all nested. Each for loop runs a maximum of N iterations, and within each for loop is a constant amount of code to be run. Therefore, the constants can be ignored, and the big-O of the algorithm is O(N^3).

4b. O(N^3). Even though the algorithm is shortened, the big-O remains the same, because in the worst case scenario, the middle for-loop could still run up to N times.

5. O(N^2). There is one for-loop in the function that runs N times. Then there is an if-else statement within that for-loop. In both cases, there it will run the two parameter get-function or the erase function, which both have a time complexity of O(N). As a result, the time complexity of the combine function is O(N\*N) = O(N^2). The big-O of the swap function can be ignored because it is a lower order term: O(N^2 + N) = O(N^2).