Harsh Chobisa—505103854—Homework 4

2. The Coord class does not have comparison operators defined.

3b. ListAll cannot be completed with just one parameter, we need two. This is because we need to pass down the parameter path as we go down the vectors recursively. So if we only did it with one parameter, there would be no way to pass down path so we could combine “File” and “New“ to make “File/New”

4a. The time complexity of the algorithm is O(N^3). There are three nested for loops, and each for loop is bounded by N.

4b. The time complexity of the algorithm is O(N^3). There are three nested for loops, and two are bounded by N, and another is bounded by J. However, J is bounded by N. So the worst case scenario is n^3.

5a. The time complexity of the algorithm is O(N^2). There is one loop bounded by N, and inside that loop, we call result.insert(v). The insert function calls findFirstAtLeast(value), which has a time complexity of N. Since we are calling findFirstAtLeast N times, the time complexity is O(N^2).

b. The time complexity of the algorithm is O(NlogN). All parts of the function have a time complexity of O(N) except for the sort, which has complexity of O(NlogN). Thus, the overall time complexity is O(NlogN).

c. The time complexity of the algorithm is O(N). There are two loops in the algorithm, and each have a time complexity of O(N), as each are bounded by for loops with a bound of N. Thus, the specific time complexity is O(2N), so the overall time complexity is O(N).