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Homework 4

1. The call to the one-argument form of Sequence<Coord>::insert causes a compile error because the comparison operators < and == have not been defined for Coords. So, the compiler does not know where to insert a Coord in relation to the others in a Sequence.
   1. We cannot solve this problem recursively with a one-parameter listAll function because then, we could not pass in a smaller subproblem. We need a parameter for the path so that the file name gets added onto it.
   2. The outer loop (variable i) takes N steps, the middle loop (variable j) takes N steps, and the inner loop (variable k) also takes N steps. These three loops are nested, so the time complexity of this algorithm is O(N^3).
   3. The time complexity of this algorithm is still O(N^3). Even though an inner loop does not necessarily iterate through all elements of the array, it can still attain a maximum value of N. So, the algorithm takes N\*N\*N steps, and its time complexity is O(N^3).
   4. The time complexity is O(N^2). The two loops are not nested, and each one iterates to a maximum value of N. The get function is O(N) because it goes through a maximum of N elements, and the insert function is O(1). So, the time complexity is O(N^2).
   5. The time complexity is O(N). The two loops are not nested and each visit a maximum of N nodes. The insertBefore function is O(1), so the time complexity is O(N). It is better than the implementation in part a.