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CS32

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Homework 4

1E)

In this case, when the iterator is used to increment the vector, the pointer points to a particular memory address. Now, when the vector size increases, the memory location may change to fit the needs of the space and the pointer to the particular location now points to a random location causing an error in the access.

3)

The issue that the compiler faces when doing a single element insert with the coordinate class is the fact that the insertion relies on comparison operators that have a defined behavior for predefined data members but do not operate on defined classes. The compiler does not understand how to compare the two coordinate classes. This can be fixed by defining a comparison operator definition in the class of the coordinate class.

4b)

You would not be able to solve this using a one parameter list all because you would not be able to pass along the path name and concatenate it since the function is a void function and does not return any value. Passing something in as a parameter allows us to “return” a value in through multiple recursive calls.

5a)

The order of this algorithm is o(n^3). Each time the number increases for N, there is one pass through N for every element of N there, through another pass of N. Thus, there are N\*N\*N passes total. This is because of the three nested for loops that are present that all go to N.

5b) o(n^3). Although we can say that we simplified the code, this basically just splits the number of passes for the second for loop to n/2 which still results in N\*N\*N in the worst case operation. This would operate as O(n^3) when simplified.

6a)

The get and insert function have the time complexity of 2N together, and considering the for loop merge to get N\*2N. This leaves us with the simplified complexity of o(n^2).

6b) Since the insert before member function has the time complexity of o(1) and the member function contains only one for loop it does one pass through the sequence and has the tine complexity of o(n).