Josh Zschiesche
CSCE 221-505

Report

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Programming Assignment 1

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(a) The purpose is to make a custom class “My_vec” that functions similarly to the standard vector. First, using only type char, then by templating it to use any type.

(b) Made a vector out of an array and gave it the required member functions so that it could be a container like vector. The member functions manipulate that array. The array is a data structure that is a collection of elements that are in sequence. First the constructor creates an array that is in the heap. This array is used throughout the classes’ member functions insert_at_rank(), raplace_at_rank(), remove_at_rank() and the copy constructor. The copy constructor alsso makes the “Deep Copy”. The insert_at_rank() inserts objects in a specific place but doesn’t delete any elements. The replace_at_rank() works the same as insert_at_rank() but will delete that element. Remove_at_rank() removes that element. If the element removed has elements in a higher index then it's important to resize and move those elements. Since the loop in my sort algorithm calls another function that loops it will have a theoretical runtime of O(n^2). The time it took to run (out of 10) the templated version was between 0.020 and 0.045s and the time to compile (out of ten) was between 0.600 and 0.750s. The time it took to compile (out of 10) the char version was between 0.850 and 1.20s and the time to run (out of 10) was between 0.005 and 1.4s.

(c) To compile:

(1) Put the files My_vec.h, My_vec.cpp, main.cpp all in one folder.
(2) Put the files My_vec_temp.h, main_temp.cpp all in one folder.
(3) For both use g++-std=c++11 *.cpp.
(4) Use ./a.out for both.

No input is necessary for either.

(Array of Chars) Output should be the elements in the array followed by its size.

(Array Template)There should be multiple test cases and their results, one with int, one with char, and one with double, and it should show what the program is doing at each stage.

All of this should be done on build.tamu.edu.

(d) I do not see any logical errors, the programs works as I think it should. Allowing manual input could cause the program to fail. Changing anything in the program could also cause the program to fail.

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(e) Some generic programming features is the template version, as it can accept any class and acts most similarly to the stl vector. The char vector can handle any character. The program is honestly not that generic except in the complex of the template cpp. There were no unique instances of c++11 features.

(f) The tests were successful with no error.