

HW10 - Copy & Move Constructor, Assignment Operator [50 pts]

Answer the following questions by modifying the hw10.cpp source file and/or answering the question directly:

1. [read [copy constructors, assignment operators, and exception safe assignment](#), read [c++ copy constructor](#)]
Complete the implementation of the vector class copy constructor. Answer Q#1 related questions listed in *main*.
2. [read [copy constructors, assignment operators, and exception safe assignment](#), read [c++ copy constructor](#)]
Complete the implementation of the vector class copy assignment operator. Answer Q#2 related questions listed in *main*.
3. [read [move semantics and rvalue references in c++11](#), read [move constructors and move assignment operators \(c++\)](#)]
Complete the implementation of the vector class move constructor.
4. [read [move semantics and rvalue references in c++11](#), read [move constructors and move assignment operators \(c++\)](#)]
Complete the implementation of the vector class move assignment operator.
5. What is the difference between a copy and move operation? What happens when the temp vector (in function scope) is returned (by value) from the *fill_doubles* function and assigned to v6 in *main*? Is the copy or move constructor invoked? How does this result in improved performance?

Run *valgrind* to check for memory leaks

Include comments in your code to indicate which code segment answers which question. Appended written answers to the bottom of the hw10.cpp source file (as source comments via *//*).

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Use the command script to capture your interaction compiling and running the program, including all operations, as shown below:

CS1C Spring 2023 TTH HW10 50pts **Due: Tu 3/28/2023**

```
cs1c@cs1c-VirtualBox ~/cs1c/hw/10 $ script hw10.scr
```

```
Script started, file is hw10.scr
```

```
cs1c@cs1c-VirtualBox ~/cs1c/hw/10 $ date
```

```
...
```

```
cs1c@cs1c-VirtualBox ~/cs1c/hw/10 $ ls -l
```

```
...
```

```
cs1c@cs1c-VirtualBox ~/cs1c/hw/10 $ make all
```

```
...
```

```
cs1c@cs1c-VirtualBox ~/cs1c/hw/10 $ ls -l
```

```
...
```

```
cs1c@cs1c-VirtualBox ~/cs1c/hw/10 $ ./hw10
```

```
... // print out output from steps 1 thru 5
```

```
cs1c@cs1c-VirtualBox ~/cs1c/hw/10 $ exit
```

```
Script done, file is hw10.scr
```

```
cs1c@cs1c-VirtualBox ~/cs1c/hw/10 $ make tar
```

```
...
```

Submit the tar package file hw10.tar by Tuesday March 28, 2023.