**Proj5.cpp Documentation**

**Purpose:**

The purpose of this project was to be familiar constructors, inheritance, pointers, references, and operators.

**Design:**

The design of this project was very interesting. Most of the code was already written because Papachristos made it for us to test against. All we had to do was make the Vehicle and Car files. I am slowly getting the hang of constructors.

**Challenges:**

I did not have much of a challenge in this project like I did with project 4. I gave myself time to work on this project unlike project 4. I put more time into understanding what I was writing. Me and my friend did collaborate a little on the Car file because we were both a little stuck with inheritance. It was much easier to this time to be able to use the <CSTRING> library.

**Changes:**

This project wasn’t as difficult as anticipated. Most of the code was already written and we just had to make it work with main. I wouldn’t change anything about it.

**Observations:**

First are the base tests.

You can clearly see that when the object is initialized, the message “Vehicle #1: Default-ctor” prints to the screen. This is with “Vehicle v1;” of course.

Next part is testing the base insertion operator and you can see that output is “Vehicle #1 @ [2.24208e-44,0,5.88506e-39]” and that the base id generation is 2.

Next is the base parameterized constructor and the output observed is “Vehicle #99 @ [39.54, 119.82, 4500] ” and the base id gen is still 2.

After that is the copy constructor. The observed output is “Vehicle #3 @ [39.54, 119.82, 4500]” with is the same as Vehicle #99 but the base id gen is now 3.

Next is the base assignment operator. This is the observed output:

Vehicle #4: Copy-ctor

Vehicle #4: Dtor

Vehicle #1 @ [39.54, 119.82, 4500]

Base idgen: 4

This doesn’t make too much sense because it needs to say “Vehicle #1: Assignment” instead of Copy-ctor and I am not sure why. I do not have the time to go back and fix this because I am just trying to turn this in on time.

After that is the move function and the observe output is:

Testing Base Move Function

Vehicle #1: CANNOT MOVE - I DON'T KNOW HOW

Next is the derived tests. This is the complete print out of the derived tests:

Testing Derived Default ctor

Vehicle #4: Default-ctor

Car #4: Default-ctor

Testing Derived insertion operator

Car #4 Plates: ╨╨o, Throttle: 0 @ [1.29251e+29, 0, 1.28479e+29]

Derived idgen: 5

Testing Derived Parametrized ctor

Vehicle #999: Parametized-ctor

Car #999: Parametized-ctor

Car #999 Plates: Gandalf, Throttle: 1875955752 @ [39.54, 119.82, 4500]

Derived idgen: 5

Testing Derived Copy ctor

Vehicle #6: Copy-ctor

Car #6: Copy-ctor

Car #6 Plates: Gandalf, Throttle: 0 @ [39.54, 119.82, 4500]

Derived idgen: 6

Testing Derived Assignment operator

Vehicle #7: Copy-ctor

Vehicle #7: Dtor

Car #4 Plates: Gandalf, Throttle: 0 @ [39.54, 119.82, 4500]

Derived idgen: 7

Testing Derived Move Function

Car #4: DRIVE to destination, with throttle @ 75

I am not quite sure what went wrong in the insertion operator as you can see that the print out was not successful. It has undesired characters. Again, with the assignment operator it should not say “Copy-ctor” and “Dtor”. Lastly, we get the “Tests Done” message and the destructors destroy the objects and print out each car and vehicle that was destroyed after the program ended.

Car #6: Dtor

Vehicle #6: Dtor

Car #999: Dtor

Vehicle #999: Dtor

Car #4: Dtor

Vehicle #4: Dtor

Vehicle #3: Dtor

Vehicle #99: Dtor

Vehicle #1: Dtor

**Complete print out:**

**////////////////////////////**

**///// Base Tests /////**

**////////////////////////////**

**Testing Base Default ctor**

**Vehicle #1: Default-ctor**

**Testing Base insertion operator**

**Vehicle #1 @ [2.24208e-44, 0, 5.88506e-39]**

**Base idgen: 2**

**Testing Base Parametrized ctor**

**Vehicle #99: Parametized-ctor**

**Vehicle #99 @ [39.54, 119.82, 4500]**

**Base idgen: 2**

**Testing Base Copy ctor**

**Vehicle #3: Copy-ctor**

**Vehicle #3 @ [39.54, 119.82, 4500]**

**Base idgen: 3**

**Testing Base Assignment operator**

**Vehicle #4: Copy-ctor**

**Vehicle #4: Dtor**

**Vehicle #1 @ [39.54, 119.82, 4500]**

**Base idgen: 4**

**Testing Base Move Function**

**Vehicle #1: CANNOT MOVE - I DON'T KNOW HOW**

**////////////////////////////**

**///// Derived Tests /////**

**////////////////////////////**

**Testing Derived Default ctor**

**Vehicle #4: Default-ctor**

**Car #4: Default-ctor**

**Testing Derived insertion operator**

**Car #4 Plates: ╨╨o, Throttle: 0 @ [1.29251e+29, 0, 1.28479e+29]**

**Derived idgen: 5**

**Testing Derived Parametrized ctor**

**Vehicle #999: Parametized-ctor**

**Car #999: Parametized-ctor**

**Car #999 Plates: Gandalf, Throttle: 1875955752 @ [39.54, 119.82, 4500]**

**Derived idgen: 5**

**Testing Derived Copy ctor**

**Vehicle #6: Copy-ctor**

**Car #6: Copy-ctor**

**Car #6 Plates: Gandalf, Throttle: 0 @ [39.54, 119.82, 4500]**

**Derived idgen: 6**

**Testing Derived Assignment operator**

**Vehicle #7: Copy-ctor**

**Vehicle #7: Dtor**

**Car #4 Plates: Gandalf, Throttle: 0 @ [39.54, 119.82, 4500]**

**Derived idgen: 7**

**Testing Derived Move Function**

**Car #4: DRIVE to destination, with throttle @ 75**

**////////////////////////////**

**///// Tests Done /////**

**////////////////////////////**

**Car #6: Dtor**

**Vehicle #6: Dtor**

**Car #999: Dtor**

**Vehicle #999: Dtor**

**Car #4: Dtor**

**Vehicle #4: Dtor**

**Vehicle #3: Dtor**

**Vehicle #99: Dtor**

**Vehicle #1: Dtor**