Homework 8

This homework includes short answer questions and a programming assignment. The short answer questions are worth 5 points each. The programming assignment is worth 30 points. The short answer questions may cover topics that are in the text, but were not covered in the lectures. Push a preliminary version of the programming assignment to Github before Wednesday's class. Push the final version of your source code, Makefile, and a text file with your short answer questions to Github before 5PM Friday.

1. **What is the "rule of five"?**

   If a class defines one or more of the following things, it really should define all five: destructor, copy constructor, copy =, move constructor, and move =. You must implement the rule of five if your class owns heap data.

2. **What is the difference between a copy and a move in C++?**

   A move in c++ turns an lvalue into and rvalue while copy turns a rvalue into an lvalue.

3. **What is copy elision?**

   Copy elision is a technique used by the compiler for optimization. It makes sure that objects are not copied unnecessarily. It is evoked by the compiler when copying over an object of the same type and the source object can not be accessed after it leaves the scope.

4. **What is a smart pointer?**

   A smart pointer is a class that pretends it is a pointer (it usually contains a pointer) and overloads the * and -> operators to get at a large amounts of data. Smart pointer are used as memory management.

5. **How can you prevent someone from copying a class you wrote?**

   You can prevent this by keeping the copy constructor and assignment operator private. You can also do this by deleting the special number functions or using a special non copyable mixin.