

# CS250 Assignment Four

## Large Integer Abstract Data Type (ADT) Part II

**Date Assigned:** Wednesday, March 14, 2007

**Date Due:** Friday, March 23, 2007

**Points:** 35

### Introduction

For this assignment, you are to modify your `LargeInteger` class from assignment 3 so that it supports operator overloading.

I am providing you with the driver for this class, so you do not need to implement one. You will need to modify the class header and cpp file as necessary.

You are also to include a word processed document discussing why we do not need to implement the copy constructor and overload the assignment operator in the class. Please be detailed, and thorough in your explanation. Explain when you would need to implement a copy constructor and overload the assignment operator. Make sure that you use correct grammar and spelling.

### Member Functions

As well as all the functions that you developed for assignment three, your class must contain implementations of the following member functions:

1. operator<<: will output the integer array to the output stream. This could be the screen or an output file. See lines 28 through 38 in the driver.
2. operator+: there should be three variations of this operator
  - (a) One that accepts a LargeInteger as a parameter and adds it to the calling object. See line 42 in the driver.
  - (b) One that accepts a long as a parameter and adds it to the calling object. See line 47 in the driver.
  - (c) One that accepts a string containing digits, and adds it to the calling object. See line 52 in the driver.
3. operator-:there should be three variations of this operator
  - (a) One that accepts a LargeInteger as a parameter and subtracts it from the calling object.
  - (b) One that accepts a long as a parameter and subtracts it from the calling object.
  - (c) One that accepts a string containing digits, and subtracts it from the calling object.
4. Three variations on the six relational operators (==, !=, >, >=, <, <=). These should return true or false depending on the result of the comparison
  - (a) One that accepts a LargeInteger as a parameter and compares it to the calling object. See line 55 in the driver.
  - (b) One that accepts a long as a parameter and compares it to the calling object. See line 61 in the driver.
  - (c) One that accepts a string containing digits, and compares it to the calling object. See line 67 in the driver.

### **Other details**

- I will not be testing your program with negative numbers, so don't worry about them!

- Leave the functions that you created for the last assignment in your class. I realise that they are not used by the driver, and redundant because the operators replace their functionality, but I want you to keep them there anyway.
- You must follow the coding standards.

### **How to submit**

- Submit a word processed document discussing copy constructors and the assignment operator.
- Submit a hard copy of the code by 9am on the day the assignment is due. Your code must be stapled together in the following order: main.cpp, LargeInteger.h, LargeInteger.cpp
- Name your project "04PUNETLargeInteger", substituting PUNET with your PU Net ID, and place the complete project folder in the CS250 drop folder on Turing by 9am on the day the assignment is due.

### **Goals**

1. Implement a program using OOP techniques.
2. Code and test your program one function at a time .
3. Learn to organize your program using .h & .cpp files for code reusability.
4. Use the new C++ coding standards.
5. Do basic error checking.
6. Understand the concept of operator overloading.
7. Understand the concept of friend functions.