

Object-Oriented Programming

Assignment 4 – class BigInt

May 11, 2017

Objectives

Practice and get familiar with classes in C++ language. In this assignment you will make use of the subject matters about Practice and get familiar with advanced skills in dealing with classes in C++ language. In this assignment you will make use of the taught subject matters about Classes (ch. 6), Constructors and Other Tools (ch. 7), and Operator Overloading, Friends and References (ch. 8), Strings (ch. 9), and Pointers and Dynamic Arrays (ch. 10).

Problem Description

Create a class `BigInt` for big integers. The class **MUST**

1. Use a **dynamic array** to represent uncertain number of digits¹.
2. Define appropriate **constructors** for initial setting of `int` and `string` values.
3. **Overload**
 - (a) arithmetic operators `+` and `-`
 - (b) insertion operator `<<` for output
4. Implement the **Big Three**:
 - (a) Overloaded assignment operator
 - (b) Copy constructor
 - (c) Destructor that releases all memory that has been allocated
5. **Test** the class in the application file:

```
BigInt a("314159265358979323846264338327950288419716939937510"), c(a);
BigInt *b = new BigInt(1618033988);

c = a + *b;
cout << a << " + " << *b << " = " << c << endl;
c = a - *b;
cout << a << " - " << *b << " = " << c << endl;
...
```

¹In this assignment you are NOT allowed to use string or vector for recording the digits.

Evaluation

- Correctness: 90%
- Styling: 10%

Submission

- **2017/05/22 (degrade by 10 points for each day delay)**
- Source code (*.cpp)
 - Show your information (Name, Student ID, Dept, Year) as comments in the beginning of your code.
 - Name the file as “Hw4_(#Student ID).cpp”
 - Upload your work to eCourse website