OOP Assignment

(inf\_int Class)

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Introduction

Our team’s project is mainly about “making a class that can maintain an infinite length of number, having a basic operator of addition, subtraction, and multiplication.” As a basic ‘Integer class’ given by C++ can only maintain at most approximately 2 billion, we should create a customized integer class, named as ‘inf\_int.’ In this report, we will explain how we made a brief concept, specification, and implementation of this customized ‘inf\_int’ class.

Concept of the ‘inf\_int’

As we explained above, a basic integer class (a.k.a ‘int’) can only maintain at most 2 billion, which means that assigning above 2 billion to the ‘int’ will make an overflow of the program, leading to the fatal error to the program. To prevent this, we decided to use ‘string’ instead. A string type can maintain an infinite length of the string (actual length is 4.2billion, which is still close to infinite, 2^(4.2billion)). A brief abstraction of the class ‘inf\_int’ looks like this:

class inf\_int

{

private :

char\* digits;

unsigned int length;

bool thesign;

public :

inf\_int();

inf\_int(int);

inf\_int(const char\* );

inf\_int(const inf\_int&);

~inf\_int();

inf\_int& operator=(const inf\_int&);

friend bool operator==(const inf\_int& , const inf\_int&);

friend bool operator!=(const inf\_int& , const inf\_int&);

friend bool operator>(const inf\_int& , const inf\_int&);

friend bool operator<(const inf\_int& , const inf\_int&);

friend inf\_int operator+(const inf\_int& , const inf\_int&);

friend inf\_int operator-(const inf\_int& , const inf\_int&);

friend inf\_int operator\*(const inf\_int& , const inf\_int&);

friend ostream& operator<<(ostream& , const inf\_int&);

};

Customized class ‘inf\_int’ has a responsibility to not only operate basic arithmetic functions properly, but also perform comparison operator and I/O functions. Thus, we overrode the basic operators to get our ‘inf\_int” class as the parameters, declaring them as ‘friend’ functions to give them permission to access the internal data (digits, length, thesign).