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**CMP305L Data Structures and Algorithms**

**Lab #1 – Review of C++**

**Exercise 1:** Implement the below given Set class,

class Set {

public:

Set (int size=5 ); //default constructor

Set (const Set & s); // copy constructor

~Set ( ); //destructor

int GetSize ( ) const ; // returns the max size of the Set

int GetCount ( ) const// returns the current number of elements within Set

bool InsertElement ( int value); // insert value

bool DeleteElement ( int value); // delete value

int GetNextElement ( ); //returns value at iter

void Reset(); //sets iter to 0;

private:

int eCount // current number of elements within the set.

int max\_size;

int iter; // variable used in reset and getNextElement function for iteration.

int \*arr ; // an array to store the Set elements.

};

Overload the below operators,

1. Assignment operator “=”.
2. A comparison operators “==” and “!=”.
3. Set addition “+” and subtraction “-“ operators.
4. Set addition assignment “+=” and subtraction assignment “- =” operators.
5. Pre and Post increments (++) and decrement s(--)
6. Set insertion “<<” and extraction “>>” operators.

**Hint**: Reset and GetNextElement functionality can tested as below codes,

setObject.Reset();

for (int i=0; i<setObject.GetCount();i++)

cout<<setObject.GetNextElement()<<endl;

**Exercise 2**: Transform the definition and implementation of Set into an equivalent template class for different data types such as integers, floats, doubles, etc. Test your program comprehensively to make sure that it does work with at least two data types, namely, integer and double.

**Note**: Write an appropriate main to test the functionality of each class.