MEDGAR EVERS COLLEGE
The City University of New York

Programming Project A

Directions:

You will create a new data type (a class) named *integer* that can represent any real number integer (an integer of any length) by using a linked list. The data type must perform integer addition and subtraction. The data type must be able to be typecasted from a string, int and double. Last, it must be able to be written to/read from the terminal or file.

The class must have the following components; however, it may contain any additional fields or methods that you deem necessary.

- A private linked list field that is used to represent the integer.
- A public default constructor that initializes the integer field to 0.
- A public overloaded constructor that takes a string parameter. It converts the parameter and assigns it to the integer field if parameter is in the proper real number integer format. Otherwise, it initialize the integer field to 0.
- A public overloaded constructor that takes an int parameter. It converts the parameter and assigns it to the integer field.
- A public overloaded constructor that takes an double parameter. It converts the parameter and assigns it to the integer field. When converting a double to an int, the decimal portion is truncated.
- A public copy constructor.
- A public assignment operator.
- A public destructor. It deallocates the integer field.
- A friend overloaded addition operator that takes two constant integer reference parameters. It returns an integer object that is equal to the sum of the two parameters.
- A friend overloaded subtraction operator that takes two constant integer reference parameters. It returns an integer object that is equal to the difference of the first parameter minus the second parameter.
- A public constant method named `ToString()` that takes no parameter. It returns a string representation of the integer field.
- A friend overloaded ostream operator. It displays the integer field.
- A friend overloaded istream operator. It reads into the inetger field.

You must adhere to the following restritions. Failure to follow restrictions will result in a 0 for the project.

- You must use class defined data structures and functions, and/or define your own.
- The use of STL library classes are prohibited.
- The class must be defined in a header file.
- You must write a main cpp file to test the integer object methods.

Grading Rubic:

Your grade will be based on the following rubric:

Final Project Grading Rubric

Category	Task	Points
Specification	◦ Program compiles. ◦ Program performs required tasks. ◦ Program produces accurate and formatted outputs.	20
Readability	◦ Program uses meanful identifiers. ◦ Program indents scopes.	5
Documentation	◦ Program provides a header. ◦ Program provides descriptions for functions.	5
		30