National University of Computer and Emerging Sciences



Lab Manual 06

Object Oriented Programming

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**Objectives:**

* Constructors: default, parameterized, copy
* Destructors.
* Pointer data members
* Constant data members
* Static Data members
* Constant objects
* Array of objects

**TASK 1:**

Implement a class called **BiggerInt**. The BiggerInt class will have two data members:

* int\* big\_int\_; // Pointer to the int array that holds the big integer
* int int\_length\_; // Variable to store the length of the big integer

While an integer is of 4 bytes in size with a range of -2,147,483,648 to 2,147,483,647. A big integer can store long integer numbers with no size limitation.

You have to implement the following:

1. Write a default constructor and initialize big\_int\_ to nullptr.

* BiggerInt();

1. Write an overloaded constructor and perform deep copy.

* BiggerInt (const int \* obj, int size);

1. Write a copy constructor and perform deep copy. Print “Copy Constructor Called” and observer the scenarios where the copy constructor is called.

* BiggerInt (const BiggerInt & obj);

1. Write a member function to make a deep copy of the big\_int\_ of the passed BiggerInt obj into the big\_int\_ of the object which called this function.

* void assign(const BiggerInt & obj);

1. Write a member function which will overload the above assign function and performs the same operations but the argument passed to this function is a pointer integer array.

* void assign(const int \* big\_int, int size);

1. Write a member function to append the big\_int\_ of the passed BiggerInt obj to the end of big\_int\_ of the object which called this function.

* void append(const BiggerInt & obj);

1. Write a member function which will overload the above append function and performs the same operations but the argument passed to this function is a pointer integer array.

* void append(const int\* big\_int, int size);

1. Write a member function to compare the big\_int\_ of BiggerInt obj with the big\_int\_ of the object which called this function. Return 0 for equal, 1 for less than and 2 for greater than.

* int compareTo(const BiggerInt & obj);

1. Write a member function which overloads the above compareTo function and performs the same operations but the argument passed to this function is a pointer integer array.

* int compareTo(const int\* big\_int, int size);

1. Write a member function to display the big\_int\_ on screen. If big\_int\_ is empty, print “No Value Assigned”.

* void display();

1. Write a destructor to deallocate any dynamically allocated memory.

* ~ BiggerInt();

1. Write a suitable main() function in the driver.cpp to test all the functions of the BiggerInt class.

**Note:**

* Deallocate all dynamically allocated memory.
* Make separate my\_big\_int.h, my\_big\_int.cpp and driver.cpp files.
* Do not use any string class built-in functions except for strlen(), if required.
* Follow all the code indentation, naming conventions and code commenting guidelines.

**TASK 2: (Static)**

Implement a class called **Box**. The Box class will have three data members:

* int length;
* int breadth;
* int height;

You have to implement the following:

1. Implement all getters/setters.
2. There should be a static data member

* static int objectCount; // Increases every time object is created

1. Write an overloaded and default constructor.
2. Write member functions as follow:
   * + static int getCount();
     + double Volume();
     + double Area();
3. Write a suitable main() function to test the functionality of the static members and functions.