CECS 475
Lab Assignment 1
Assigned date: 1/24
Due date: 1/29
20 points

Create class IntegerSet. Each IntegerSet object can hold integers in the range 0–100. The set is represented by an array of bools. Array element a[i] is true if integer i is in the set. Array element a[j] is false if integer j is not in the set. The parameterless constructor initializes the array to the "empty set" (i.e., a set whose array representation contains all false values).

Provide the following methods:

a) Method Union creates a third set that is the set-theoretic union of two existing sets (i.e., an element of the third set's array is set to true if that element is true in either or both of the existing sets—otherwise, the element of the third set is set to false).

b) Method Intersection creates a third set which is the set-theoretic intersection of two existing sets (i.e., an element of the third set's array is set to false if that element is false in either or both of the existing sets—otherwise, the element of the third set is set to true).

c) Method InsertElement inserts a new integer k into a set (by setting a[k] to true).

d) Method DeleteElement deletes integer m (by setting a[m] to false).

e) Method ToString returns a string containing a set as a list of numbers separated by spaces. Include only those elements that are present in the set. Use --- to represent an empty set.

f) Method IsEqualTo determines whether two sets are equal.

Test your class IntegerSet by using the main method below:

```
// initialize two sets
Console.WriteLine( "Input Set A" );
IntegerSet set1 = InputSet();
Console.WriteLine( "\nInput Set B" );
IntegerSet set2 = InputSet();

IntegerSet union = set1.Union( set2 );
IntegerSet intersection = set1.Intersection( set2 );

// prepare output
Console.WriteLine( "\nSet A contains elements:" );
Console.WriteLine( set1.ToString() );
Console.WriteLine( "\nSet B contains elements:" );
Console.WriteLine( set2.ToString() );
Console.WriteLine(
"\nUnion of Set A and Set B contains elements:" );
Console.WriteLine( union.ToString() );
Console.WriteLine(
"\nIntersection of Set A and Set B contains elements:" );
Console.WriteLine( intersection.ToString() );
```

```
// test whether two sets are equal
if ( set1.IsEqualTo( set2 ) )
Console.WriteLine( "\nSet A is equal to set B" );
else
Console.WriteLine( "\nSet A is not equal to set B" );

// test insert and delete
Console.WriteLine( "\nInserting 77 into set A..." );
set1.InsertElement( 77 );
Console.WriteLine( "\nSet A now contains elements:" );
Console.WriteLine( set1.ToString() );

Console.WriteLine( "\nDeleting 77 from set A..." );
set1.DeleteElement( 77 );
Console.WriteLine( "\nSet A now contains elements:" );
Console.WriteLine( set1.ToString() );

// test constructor
int[] intArray = { 25, 67, 2, 9, 99, 105, 45, -5, 100, 1 };
IntegerSet set3 = new IntegerSet( intArray );

Console.WriteLine( "\nNew Set contains elements:" );
Console.WriteLine( set3.ToString() );
} // end Main
```

Grading requirements

- A hard copy of your source code.
- Document your program
- Demonstrate the result to the instructor
- Submit the lab assigment to BeachBoard