Problem Set 12 - Static MultiSet

A multiset is a collection of objects. The typical set data structure methods are listed in the *Collection* interface. Given this information, complete each of the tasks below.

Tasks:

1. Create a header file named `"StaticMultiSet.h"` that defines a generic class *StaticMultiSet* that publicly inherits the interfaces *Collection* and *Object* from the accompanying header files `"XCollection.h"` and `"Util.h"`, respectively.

2. Within the body of *StaticMultiSet*, include

   ☐ A private generic *Array* field named *data*.

   ☐ A private long field named *size*.

3. Within the body of *StaticMultiSet*, define

   ☐ A public default constructor that assigns 0 to *size* and a generic *Array* object of size 30 to *data*.

   ☐ A public overloaded constructor that takes a long parameter. It assigns a generic *Array* object that is the size of the parameter to *data* and 0 to *size* if the parameter is positive; otherwise, it assigns 0 to *size* and a generic *Array* object of size 30 to *data*.

   ☐ a public copy constructor.

   ☐ a public assignment overloaded.

   ☐ a public empty destructor.

4. Within the body of *StaticMultiSet*, define a public overridden `ToString()` method from *Object* that returns a string of the elements of the dataset as a list enclosed in curly braces.

5. Within the body of *StaticMultiSet*, define

   ☐ A public overridden `Size()` method from *Collection* that returns *size*.

   ☐ A public overridden `Empty()` method from *Collection* that returns true if *size* is zero; otherwise, it returns false.

   ☐ A public bool constant method named `Full()` that takes no parameters. It returns true if the dataset is full; otherwise, it returns false.

6. Within the body of *StaticMultiSet*, define

   ☐ A public overridden `Contains()` method from *Collection* that returns true if the parameter is a dataset member; otherwise, it returns false.

   ☐ A public overridden `Count()` method from *Collection* that returns the number of occurrences of the parameter in the dataset.

7. Within the body of *StaticSet*, define

   ☐ A public overridden `Insert()` method from *Collection* that adds the parameter to the dataset if the parameter is not in the dataset and the dataset is not at capacity.

8. Within the body of *StaticSet*, define

   ☐ A public overridden `Remove()` method from *Collection* that removes the parameter from the dataset if the dataset is not empty and the parameter is in the dataset.

   ☐ A public overridden `RemoveAll()` method from *Collection* that removes all instances of the parameter from the dataset.

9. Create a cpp file named `"main.cpp"` that

    a. Declares an char *StaticMultiSet* object with a size of 128.

    b. Opens a file and reads the character of the file into the object.

    c. Displays the number of each letter in the object.