**Extra Credit Final Exam Problem**

(10 Points)

Create an array list for String, called MyList, which can be used with the Collections methods sort and binarySearch, and which supports the use of the for each construct for the purpose of iterating through the list’s elements.

A skeleton of the class MyList has been provided. You must implement the methods in this skeleton; you may also wish to add other. A main method has been provided in this class which tests whether your class can be used with Collections and with the for each construct. The expected output from this main method is the following:

Bob Joe Steve

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Bob

Joe

Steve

In order for your class to be usable with Collections and for each, you will need to implement one or more interfaces and/or extend from some other class. You *may not* make your class a subclass of Java’s ArrayList or Vector.

Some of the methods in this class may be new to you – here is an explanation about what they do.

String set(int i, Object element). This is like insertion but does something more. It places element in position i, but also returns the String that was in position i before.

void removeNulls(). When you perform sorting and display the results, the value “null” must not appear in the ouput. The removeNulls method replaces the current background array with one in which there are no nulls.

boolean add(Object ob). Nulls must not be added to your list. If a null is passed in, the add method will not add it, and will return false. Otherwise, the element will be added and the return value is true.

Note: For reasons having to do with the interface(s) you will implement and/or class you will extend, it is necessary for inputs to the methods to be of type Object. This means you will have to cast these inputs to type String. Do *not* change the signatures of any of the methods.

Note: You *must* use the @Override annotation whenever you are overriding a method.

Note: The main point of this problem is to demonstrate the ability to create a data structure that makes use of the Collections API. Since we have already implemented array lists in class, implementing yet another list is not the main interest here (though it must be done). Therefore, if you cannot obtain the output shown above when your code is run (which would demonstrate that your code does work with Collections and for each), you will receive very little partial credit.

Note: This problem will appear as an extra credit problem in the exam. My advice is to solve the problem before the exam and then quickly type in your solution during the exam. You won’t have time to figure it out while the exam is going on.