Graded Exercise 3

CSC144 Software Architecture

11 April 2018

Write a program that defines and tests a method for searching with the binary search algorithm. Include code that measures the number of comparisons in each search and reports these measurements.

You may draw assistance from your instructor, your classmates, and articles on the Internet, but your fingers must type every character in your program.

Here is some code to get you started.

```
package binarysearch;

// TO-DO: Add import statements here.

// TO-DO: Add a Javadoc comment that includes
// the name of this exercise, the name of our
// course, your name, and the date.
//
// Include within the comment a brief letter
// to a student who might study computer science
// next year. Use this letter to share with this
// student advice on how to succeed.
public class BinarySearch {

    // TO-DO; Add a Javadoc comment that
    // describes the purpose of this variable.
    // (Its purpose is to count the number of
    // times that the binarySearch() method compares
    // the value for which it is searching with an
    // element of the list in which it is searching.)
    public static int comparisons = 0;

    // TO-DO: Add a Javadoc comment that describes
    // this method.
    public static List<Integer> makeList( int n ) {
```

```
        return new ArrayList<>();
    } // makeList( int )

    // TO-DO: Add a Javadoc comment that describes
    // this method.
    public static void printList( List<Integer> data ) {

    } // printList( List<Integer> )

    // TO-DO: Add a Javadoc comment that describes
    // this method.
    public static boolean binarySearch( int value,
            List<Integer> data ) {

        return false;
    } // binarySearch( int, List<Integer> )

    public static main( String [] args ) {

        // TO-DO: write code that creates a sorted list that
        // contains the first N positive even integers.

        // TO-DO: write code that prints the list.
        // You may hide this code in a comment when
        // you measure the performance of the binary
        // search on large lists.

        // TO-DO: write a loop generates random integers
        // in the range 0 to 2N (these integers could be odd
        // or even) and searches through the list to determine
        // whether or not the list contains the number.
        // Include within the loop code that reports
        // whether or not a random number is in the list
        // and the number of comparisons required to determine
        // that.
    } // main( String [] )

} // BinarySearch
```