Queens College, CUNY
Computer Science 212 – Practice Final B

Last name_____ First name_____

Question 1. (20 points)

Write a Java application that will take one argument from the command line, and output two lines:
one containing a string made up of all the non-digits in the argument, and another the sum of the digits.
For example,

```
java Question1 th12isi3s4the93fina5lex1am
```

Should output two lines:

```
thisisthefinalexam
The sum is: 28
```

If there is no command line argument an *IllegalArgumentEWxception* should be thrown.
The Boolean method *isDigit* in the *Character* wrapper class may be of use.

```
public class Question1 {
      public static void main (String[] args) {
```

```
      } //main
} //Question1
```

Question 2: (20 pts.)

Given the following declaration for a linked list (with head node) containing *String*s, fill in the code for the two missing methods:

```
public class StringListNode {
   public String data;
   public StringListNode next;
   public StringListNode () {
      data = "";
      link = null;
   }
public class StringList {
   protected StringListNode first, last;
   protected int count;
   public StringList () {
      first = new StringListNode;
      last = first;
      count = 0;
   }
   public boolean isSorted () {
   // determine if the nodes in the list are in alphabetical order
   //
```

```
   public insertAfter (StringListNode afterMe, String value) {
   // add a new node to the list so it appears after the node
   // referenced by 'value'
```

Question 3: (20 pts.)

Write a subclass of *IllegalArgumentException* called *StringListException*.

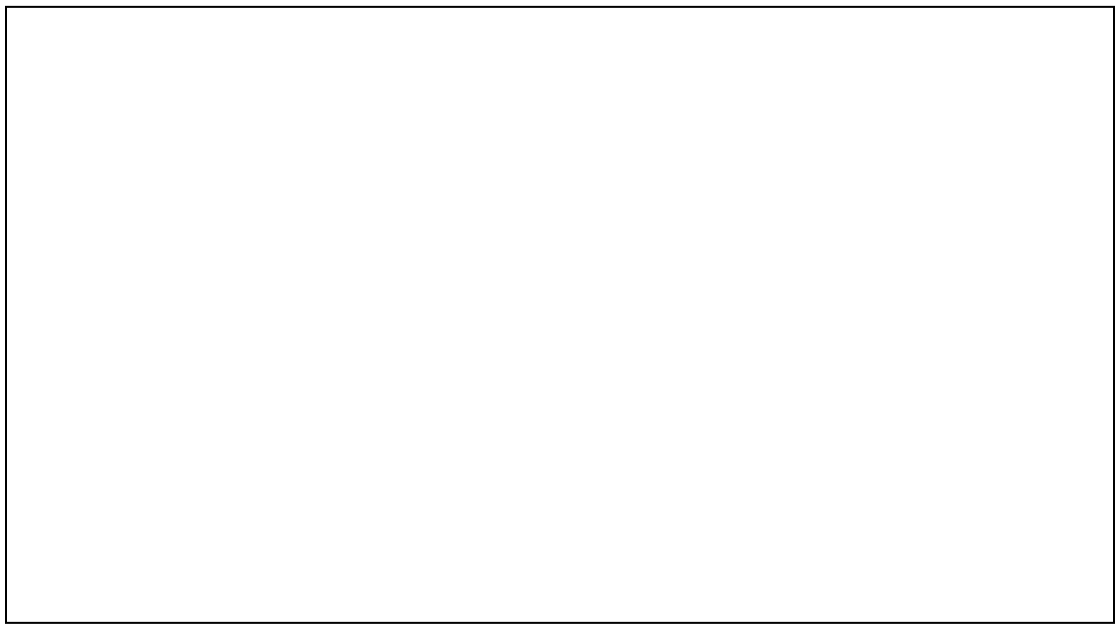
Write a subclass of *StringList* called *ThreeCharacterStringList* which should contain only strings that have three characters. Provide an appropriate no-argument constructor.

Write a method called *insertAfter* that relies on using the *insertAfter* method in the super class, but throws a *StringListException* if the parameter is not a string of length three.

Question 4: (20 pts.)

a. Assume the method *append(String s)* is available in the *StringList* class. Write the method *buildList* in the following class that will append the values from the array *stringValuers* to *strList* only if they start with the letter "a". Provide a *try/catch* block that will print any illegal values to the system console and continue building the list.

```
public class Question3 {
   ThreeCharacterStringList strList;
   String[] stringValues = {"ape","apple","art","cat","car","ant","bat"};
   public static void main (String args[]) {
      buildList (stringValues);
      System.out.println(posList);
   } //main
   private void buildList(String[] strings) {
```



```
   } // buildlist
} // Question3
```

Question 5. (20 points)

Write a recursive method called countEven that will determine how many even digits there are in a given integer.
For example,

countEven(12345) returns 2 (2 and 4 are even)
countEven(11111111) returns 0 (there are no even digits)
countEven(0) returns 1 (let's consider zero as even)

Hint: If the first digit in the number is even, then the answer is at least one, plus how many even digits there are in the rest of the number.