# Sample Final Exam (Chapters 12 to 17) Answers

Each question worth 20% Name_____

1) Write a recursive method (just a method—not a complete program) that returns `true` if the string it is passed is null or is made up exclusively of one or more occurrences of the letter `'A'`, and `false`, otherwise.

```
public static Boolean searchA(String s)
{
   is (s.length() == 0)
      return true;
   if (s.charAt(0) = 'A' && searchA(s.substring(1))
      return true;
   else
      return false;
}
```

2) What is displayed when the following method is passed 2:

```
public void f(int x)
{
   System.out.println("A");
   if (x >= 0)
   {
      System.out.println(x);
      f(x-2);
      System.out.println("x");
   }
   System.out.println("D");
}
```

```
A
2
A
0
A
D
x
D
x
D
```

3) Write a method `rotate` (just a method—not a complete program) that removes the first node on a linked list and places it at the end of the list, If the list is empty or has only one node, `rotate` has no effect on the list, Assume each node has a `link` field that points to the next node, The link field of the last node on the list contains `null`, Assume your method is in the `MyListClass`, Thus, it has direct access to the `head` field that points to the first node on the list.

```
public static void rotate()
{
   Node p = head, save;
   if ((p == null) || (p.link == null))
      return;
   while (p.link != null)
      p = p.link;
   p.link = head;
   save = head;
   head = head.link;
   save.link = null;
}
```

4) Write a complete program in which you read from the file `bert.txt`, `bert.txt` contains integers, Your program should count the number of integers that `bert.txt` contains and write this count to the file `ernie.txt`, For example, if `bert.txt` contains five integers, your program should write

```
count = 5
```

to `ernie.txt`, Do NOT perform robust input—assume `bert.txt` contains only valid integers.

```
import java.util.*;
import java.io.*;
class Feq4
{
   public static void main(String[] args) throws IOException
   {
      int count = 0;
      Scanner infile = new Scanner(new File("bert.txt");
      PrintWriter outfile = new PrintWriter("ernie.txt");
      while (infile.hasNextInt())
      {
         infile.nextInt();
         count++;
      }
      outfile.println("count = " + count);
      fclose(outfile);
   }
}
```

5) Write method that is passed an `Object` array whose `l`ength is 3. The first slot of the `array` points to an `A` object; the second slot points to a `B` object; the third slot points to a `C` object. The `A`, B, and `C` classes all have their own `display` method. Your method should call the `display` method for each of the three objects.

```
public static void arrayDisplay(Object[] a)
{
   for (int i = 0; i < 3; i++)
   {
       if (a[i] instanceOf A)
          ((A)a[i]).display();
       else
       if (a[i] instanceOf B)
          ((B)a[i]).display();
       else
       if (a[i] instanceOf C)
          ((C)a[i]).display();
   }
}
```