

```
class recursiveLinkedLists2
{
    static class Node
    {
        String data;
        Node next;

        Node(String data, Node next)
        {
            this.data = data;
            this.next = next;
        }
    }

    static void printList(Node p)
    {
        if (p != null)
        {
            System.out.println(p.data);
            printList(p.next);
        }
    }

    static Node copy(Node p)
    {
        if(p == null)
            return null;
        else
            return new Node(p.data, copy(p.next));
    }

    ////////////////////////////////////////////////////////////////////
    // Appending two lists

    /*
    * Appending two lists is a simple way of creating
    * a single list from two. This function adds the
    * second list to the end of the first list
    */

    static Node append(Node p, Node q)
    {
        if(p == null)
            return q;

        else
        {
            p.next = append(p.next, q);
            return p;
        }
    }

    ////////////////////////////////////////////////////////////////////
    // "Shuffle-Merging" two lists

    /*
    * Here is a more complex function to combine two
    * lists; it simply zips up two lists, taking a
```

```
    * node from one, then from the other. The first
    * list in the original call now points to the
    * new list.
    */
```

```
static Node shuffle(Node p, Node q)
{
    if(p == null)
        return q;

    else if(q == null)
        return p;

    else
    {
        p.next = shuffle(q, p.next);    // Note how we exchange p and q here
        return p;
    }
}
```

```
////////////////////////////////////
// Merging two sorted lists
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```
/*
 * Here is another more complex function that
 * combines two lists; this one merges nodes
 * from two sorted lists, preserving their order.
 */
```

```
static Node merge(Node p, Node q)
{
    if(p == null)
        return q;

    else if(q == null)
        return p;

    else if(p.data.compareTo(q.data) < 0)
    {
        p.next = merge(p.next, q);
        return p;
    }
    else
    {
        q.next = merge(p, q.next);
        return q;
    }
}
```

```
////////////////////////////////////
```

```
static public void main(String[] args)
{
    Node p, q, output;

    // create a new linked-list of fruit:
    Node fruit =
        new Node("apple",
            new Node("banana",
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        new Node("cherries",
            new Node("fig",
                new Node("grapes", null)
            )
        )
    )
);

// create another linked-list, this time of animals:
Node animals =
    new Node("aardvark",
        new Node("bat",
            new Node("cat",
                new Node("dragon",
                    new Node("elephant", null)
                )
            )
        )
    );

System.out.println("\nAppend Animals into Fruit:");
p = copy(fruit);
q = copy(animals);
output = append(p, q);
printList(output);

System.out.println("\nShuffling Animals into Fruit:");
p = copy(fruit);
q = copy(animals);
output = shuffle(p, q);
printList(output);

System.out.println("\nMerging Animals into Fruit:");
p = copy(fruit);
q = copy(animals);
output = merge(p, q);
printList(output);

System.out.println("\nDone!");
}
}
```