

# Lab 11: Recursion

Due: 11/14/12 11:59PM

You will design 4 recursive static methods dealing with `ArrayList<Integer>` objects. Put them in a class called `Recursive`.

For `add` and `print`, note that the public method is not the recursive one. It calls a *recursive helper function* that uses an `int` `index` parameter to avoid having to copy the `ArrayList` multiple times.

**Note: Do not use any for or while loops.**

Remember, each recursive method needs a recursive call on a *smaller* input, and a non-recursive base case. The trick is to assume that the recursive call works! Get `buildList` and `printList` to work first – test those.

```
class Recursive
{
    // this one builds a list containing values from 1 to n
    public static ArrayList<Integer> buildList(int n)
    {
        // write this in terms of a recursive call using a smaller n
    }

    // this one reverses a list in-place
    public static void reverse(ArrayList<Integer> lst)
    {
        // write this in terms of a recursive call using a smaller lst
    }

    // return the sum of all Integers in the ArrayList
    // this should not change the lst argument
    public static Integer add(ArrayList<Integer> lst)
    {
        return add(lst,0);
    }

    // Print out all the contents of the argument
    // this should not change the lst argument
}
```

```

public static void print(ArrayList<Integer> lst)
{
    print(lst,0);
    return;
}

private static Integer add (ArrayList<Integer> lst, int index)
{
    // think of the input is the inclusive sublist of elements from index
    // to lst.size().  make this sublist shorter in the recursive call
    // by incrementing index
}

private static void print (ArrayList<Integer> lst, int index)
{
    // write this in the same way as add, above
}
}

```

A driver class for this code might look like this:

```

class driver
{
    public static void main(String[] args)
    {
        ArrayList<Integer> lst = Recursive.buildList(5);
        Recursive.print(lst);
        System.out.println("+---");
        System.out.println(Recursive.add(lst));
    }
}

```

## Turn In

Put all java files in a directory named YourName\_1110\_lab11, zip it up and submit the zip file to blackboard.