CS 445 Lab6: Recursion

Introduction

In this lab, you will design, implement, and test two recursive algorithms. The primary goal is to practice devising a recursive solution to a problem, and then implementing that solution in code. Recall the general steps to devising a recursive solution:

1. Identify the subproblems: What smaller (yet structurally identical) subproblems will be used to solve the original problem?
2. Identify how answers are composed: Once the solutions to the subproblems will be used to solve the original problem?
3. Identify the base cases: What are the smallest problems that must be solved directly, without recursion?
4. Verify termination: Ensure your solution will not cause infinite recursion.

Exercise

Write the following two methods inside of a class cs445.lab6.Lab6 :

```
/**
 * Reverses the order of the objects in an array using
 * recursion
 */
static <T> void reverse(T[] a)

/**
 * Replaces each instance of character `before` with
 * character `after` within `str`, and returns the
 * resulting string (using recursion)
 */
static String replace(String str, char before, char after)
```

Be sure to test that these methods work as expected! You are provided with class cs445.lab6.Testers that calls each of the above methods on a few instances, but you should convince yourself that they work in all scenarios.