

Note: There was a Lab #5, but no Homework #5 to go with it.

Lab Exercises. (Due: Tues., 23 October 2001 in lab)

Copy the directory `$master/hw/lab6` to a directory of your own, using commands such as

```
cp -r $master/hw/lab6 .
```

In this directory, you should find a file called `README.lab6`, with directions about what to do during the scheduled lab. We strongly suggest that you read over this file *before* going to your lab.

We intend that you finish the lab exercises *in lab* and have your TA check them off. You can have any TA in any lab section check off your lab.

Homework Exercises. (Due: Fri., 19 October 2001 at midnight) Create a directory to hold your answers to this homework set. Copy the files from `$master/hw/hw6` into this directory. Put non-program answers into a file `hw6`. Use the command `submit hw6` to submit your solutions to the problems below.

1. Exercise 4.2 from the *Data Structures* text. See `~cs61b/hw/hw6/ConcatList.java`.
2. Exercise 4.4 from the *Data Structures* text. See `~cs61b/hw/hw6/LinkedList.java`.
3. Show each of the following *false* by exhibiting a counterexample. Assume that f and g are any real-valued functions.
 - a. $O(f(x) \cdot s(x)) = o(f(x))$, assuming $\lim_{x \rightarrow \infty} s(x) = 0$.
 - b. If $f(x) \in O(x^3)$ and $g(x) \in O(x)$ then $f(x)/g(x) \in O(x^2)$.
 - c. If $f(x) \in \Omega(x)$ and $g(x) \in \Omega(x)$ then $f(x) + g(x) \in \Omega(x)$.
 - d. If $f(100) = 1000$ and $f(1000) = 1000000$ then f cannot be $O(1)$.
 - e. If $f_1(x), f_2(x), \dots$ are a bunch of functions that are all in $\Omega(1)$, then the sum

$$F(x) = \sum_{1 \leq i \leq N} f_i(x) \in \Omega(N).$$

4. Using the linked representation of binary trees in `~cs61b/hw/hw6/Tree.java`, fill in the following complementary functions (see `~cs61b/hw/hw6/FlattenTree.java`).

```
/** The sequence of all labels of T, in inorder. */
static String[] flatten (Tree T) {
    // FILL IN
}

/** A binary tree of minimum depth whose labels, in inorder, are
 * L[0], L[1], .... */
static Tree treeify (String[] L) {
    // FILL IN
}
```