# MA/CSSE 473 – Design and Analysis of Algorithms

## Homework 11 (40 points total)

This is a short assignment partly because there are three assignments due the same week. HW12 is a much more substantial assignment.

When a problem is given by number, it is from the textbook. 1.1.2 means "problem 2 from section 1.1" .

### Problems for enlightenment/practice/review (not to turn in, but you should think about them):

How many of them you need to do serious work on depends on you and your background. I do not want to make everyone do one of them for the sake of the (possibly) few who need it. You can hopefully figure out which ones you need to do.

7.1.7 (virtual initialization)
7.2.2 (Horspool for patterns in DNA)
7.2.5 (is there a case where Horspool does more comparisons than brute force?)
7.2.9 (left-to-right checking OK after a single character match in Horspool, Boyer-Moore?)
7.3.1 (insert specific keys into hash table with specific hash function and separate chaining)

### Problems to write up and turn in:

1. (10) 7.1.6 (ancestry problem). You may **NOT** assume any of the following:

   - The tree is binary
   - The tree is a search tree (i.e. that the elements are in some particular order)
   - The tree is balanced in any way.

   It is simply a directed graph with no cycles and a single course node (the root)

2. ( 6) 7.2.3 (Horspool for binary strings)

3. ( 9) 7.2.7 (Boyer-Moore for binary strings)

4. ( 4) 7.2.8 (does Boyer-Moore still work with just one table?)

5. ( 5) 7.3.4 (probability that n keys all hash to the same table location)

6. ( 6) 7.4.3 (minimum order of a B tree that guarantees no more than 3 disk accesses in a tree with $10^8$ elements)