

Math 245, Spring 2010, Weekly homework 4, due on March 19

1. Problems 50, 51, 52, 63, 64 from 4.1. The last two problems can be done in Maple or C++. Either way, turn in the code with the answers to the questions.
2. Write pseudocode for the following:
 - (a) computing a^n
 - (b) computing $n!$
 - (c) computing $x^n \bmod m$, where x, n, m are positive integers
3. With each step you take when climbing a staircase, you can move up either one stair or two stairs. As a result, you can climb the entire staircase taking one stair at a time, taking two at a time, or taking a combination of one- and two-stair increments. For each integer $n \geq 1$, if the staircase consists of n stairs, let c_n be the number of different ways to climb the staircase. Find a recurrence relation for c_1, c_2, \dots
4. (extra credit) Give a recursive definition of the functions \max and \min so that $\max(a_1, a_2, \dots, a_n)$ and $\min(a_1, a_2, \dots, a_n)$ are the maximum and minimum of the n numbers a_1, a_2, \dots, a_n respectively.