

CSE 311: Foundations of Computing I  
Assignment #5  
April 27, 2012  
due: Friday, May 4, 1:30 p.m.

Textbook numbering labeled “6th edition” refers to the textbook’s Sixth Edition.  
Numbering that is unlabeled refers to the Seventh Edition.

1. Section 5.1 [6th edition: Section 4.1], exercise 14. Use mathematical induction.
2. Use mathematical induction to prove that  $n! < n^n$  whenever  $n$  is an integer greater than 1.
3. Section 5.1 [6th edition: Section 4.1], exercise 34. Use mathematical induction.
4. Section 5.1, exercise 60 [6th edition: Section 4.1, exercise 56].
5. Define the Fibonacci numbers as follows:  $f(0) = 0$ ,  $f(1) = 1$ , and  $f(n) = f(n - 2) + f(n - 1)$  for all integers  $n \geq 2$ . Prove by induction that, for all integers  $n \geq 2$ , the number of iterations used by Euclid’s algorithm to compute  $\gcd(f(n+1), f(n))$  is  $n - 1$ .