

CS4104 Spring 2007 Homework Assignment 9

Due at 11:00pm on Tuesday, March 27

50 Points

- 1.** [15 points] Suppose that you have a function `PRIME` that is a probabilistic algorithm for determining if a value n is prime or not. The probability that it reports n to be prime when it is in fact composite is less than half. Then, what is wrong with the following statement?
“The probability that n is in fact composite given that `PRIME` reports that n is prime is less than one half.”
- 2.** [15 points] Show how to compute the square of a 2×2 matrix with only five multiplications.
- 3.** [20 points] Suppose that you find an algorithm to multiply 4×4 matrices with k multiplications. What would be the complexity of a general matrix multiplication algorithm based on this algorithm? What is the maximal value of k that will lead to an asymptotic improvement over Strassen’s algorithm?