

**Cpr E/Com S 426/526 Introduction to Parallel Algorithms and Programming**  
**Fall 2009**

**Homework 1**

**Due Tuesday, September 29**

**Type your answers.**

1. (10 points) We discussed the Horner's rule to evaluate a polynomial. According to this rule,

$$P(x) = a_{n-1} * x^{n-1} + a_{n-2} * x^{n-2} + \dots + a_2 x^2 + a_1 x + a_0$$

is evaluated as

$$((\dots((a_{n-1} * x + a_{n-2}) * x + a_{n-3}) * x + a_{n-4}) \dots) * x + a_1) * x + a_0$$

Give an algorithm to evaluate a polynomial in parallel using Horner's rule and analyze its running time.

2. (10 points) Let  $A$  be a boolean array of size  $n$ . For each entry of  $A$  that is 0, we are asked to compute the distance (in terms of the number of array elements) to the nearest 1 to the left. Design a parallel algorithm to solve this problem and compute its run time.