

Homework Assignment #1

CSCI 2720

Fall 2004

Posted: Thursday, Aug 26th

Due: Wednesday, September 1st

30 points

1. The algorithm below is for solving prefix averages problem. Evaluate the running time of this algorithm. (5 points)

Algorithm prefixAverages1(X):

Input: An n-element array X of numbers.

Output: An n-element array A of numbers such that A[i] is the average of elements X[0], ..., X[i].

Let A be an array of n numbers.

for i ← 0 to n - 1 do

 a ← 0

 for j ← 0 to i do

 a ← a + X[j]

 A[i] ← a/(i+1)

return array A

2. Develop a more efficient algorithm than prefixAverages1 and evaluate its running time complexity. (10 points)

3. Provide solutions for the following problems from Chapter 2 of Lewis and Denenberg (5 points each).

Problem 15

Problem 17

Problem 19