CMPE 300 - Analysis of Algorithms
Fall 2015
Assignment 2

Due: 05.01.2016

Bring the hard copy of your homeworks to the final exam.

Question 1

Consider a list of n integers $X = \{x_1, x_2, \ldots, x_n\}$ where $x_1 = x_2 = \ldots x_i \neq x_{i+1} = x_{i+2} = \ldots x_n$.

a) Write an EREW PRAM algorithm in pseudocode for finding the index i where the number of processeors is p. Perform an analysis and express the time complexity.

b) Suppose that any EREW PRAM algorithm requires $(\log n - \log p)$ time for solving the problem. Prove that CREW PRAM is more powerful than EREW PRAM.

Question 2

Consider a permutation of the list of the integers in Question 1 and call the new list $Y = \{y_1, y_2, \ldots, y_n\}$. Write a Monte Carlo algorithm in pseudocode to find the integer which appears most in the list. Perform complexity analysis. Does your algorithm always give the correct answer? You will get more points or no points at all depending on the complexity of your algorithm.