Assignment 3

Due on April 2, 2025

1. Give an CREW algorithm for solving the problem of multiplying an *n*×*n* matrix *A* and vector *x* in *O*(log *n*) time. How many processors does your algorithm require? How much work does it require? Comparing your algorithm to its sequential one, what is its efficiency and speedup? (Use *O*(.) notation to describe various results).

2. Make the algorithm in Problem 1 to work on an EREW PRAM. What is its running time?

3.Input: *x*[1], *x*[2], *x*[3], …, *x*[*i*], …, *x*[*n*]

Output: *y*[*i*] 1<=*i*<=*n* where *y*[*i*] saves the maximum number among the first *i* elements of array *x*.

Please give an *O*(log *n*) time parallel EREW algorithm.

4.Give a constant time CRCW PRAM algorithm for problem 3.

5. Give an *O*(1) CRCW algorithm for Logical OR.