

Indian Institute of Technology (IIT-Kharagpur)

AUTUMN Semester, 2016
COMPUTER SCIENCE AND ENGINEERING
CS60026: Parallel and Distributed Algorithms
Tutorial 2

Full Marks: For Your Effort

Time allowed: Unbounded hours

Tutorial-2

1. You are given a sorted array $X = (x_1, x_2, \dots, x_n)$ such that each x_i is labeled l_i , where $l_i \in \{1, 2, \dots, m\}$ for $m = \mathcal{O}(\log n)$.

- (a) Propose a $\mathcal{O}(\log n)$ CREW PRAM algorithm to determine for each $1 \leq i \leq m$, the minimum element of X with label l_i . Your algorithm must use $O(n)$ operations and should not use any sorting algorithms.

[Hint: You may try to create auxiliary arrays - one for each label]

- (b) If $m = \mathcal{O}(\log \log n)$, can we do better in the CREW PRAM model? What if the model were CRCW PRAM?
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