School of Computing and Information Systems

COMP90025: Parallel and Multicore Computing

Tutorial

Theory topics

1. Given a one-dimensional mesh of processor P_i for $1 \leq i \leq p$, i.e. a linear array, in which each processor stores a value, develop a parallel algorithm to determine and send to all mesh processors the maximum of these values. To transfer data use a statement like $\langle \text{variable1} \rangle \leq \langle \text{direction} \rangle (\langle \text{variable2} \rangle)$, where $\langle \text{direction} \rangle$ is either "left" or "right".

2. Consider the problem of finding the *second* largest number in an array of n numbers. Write an optimal EREW PRAM algorithm that does so. Show that your algorithm is optimal.

3. Consider the problem of finding the index of the first occurrence of a number x in an array of n numbers. Using an appropriate PRAM model, write an algorithm that does this in constant time.