

CSE 332 Winter 2015 - Section 8 Worksheet

- Parallel Prefix Sum:** Given input array [8,9,6,3,2,5,7,2], output an array such that each $\text{output}[i] = \text{sum}(\text{array}[0], \text{array}[1], \dots, \text{array}[i])$, using the Parallel Prefix Sum algorithm from lecture. Show the intermediate steps. Draw the input & output arrays, and for each step, show the tree of recursive task objects that would be created (where a node's child is for two problems of half the size) and the fields each node needs. Do not use a sequential cut-off.

- Parallel Prefix FindMin:** Given input array [8,9,6,3,2,5,7,4], output an array such that each $\text{output}[i] = \text{min}(\text{array}[0], \text{array}[1], \dots, \text{array}[i])$. Show all steps, as above.

- Show that Quicksort with sequential partitioning, but parallel recursive sorting, is indeed $O(n)$, by solving the recurrence relation shown in lecture: $T(n) = n + T(n/2)$

- Show that a completely parallel Quicksort, with parallel partition and recursion, is $O(\log^2 n)$, by solving the recurrence relation shown in lecture: $T(n) = O(\log n) + T(n/2)$