CSE 332 16au Section 7 Worksheet

1. **Parallel Prefix Sum:** Given input array [8, 9, 6, 3, 2, 5, 7, 4], output an array such that each output[i]=sum(array[0],array[1],…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.

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

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

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