CS5351.0501/0502, Summer I, 2009
Parallel Processing
Assignment 3

lssued: 06/29/2009
Due: 07/06/2009

1. $(20 + 5 + 5 = 30$ pts)

   (1) Write an algorithm **SUMMATION**(**CCC SIMD**) that adds $n = k2^k$ values on the SIMD-CCC model with n nodes $P_0, P_1, \cdots, P_{n-1}$;

   (2) Show the steps taken by your algorithm for finding the sum of $n = 24$ values;

   (3) Analyze the time complexity of your algorithm.

2. $(35 + 15 = 50$ pts) What are the scaled speedup and scaled efficiency for

   - The hypercube summation algorithm in Fig.6-1? Can you propose changes to improve scaled speed up and scaled efficiency? If yes, please state how first and if possible please write a pseudo code version of the revised algorithm. If not, specify why.
   - The shuffle-exchange summation algorithm in Fig.6-4?

3. (30 pts) Write a parallel algorithm that will add an given n integers in a hypercube according to Figure 6-3 of the textbook.