CMPE 478: Parallel Processing Homework 1, Fall 2013 due Nov. 5th This project can be done in groups of 2.

Problem 1

Give a work efficient algorithm that computes parallel prefix summation on an array in log(n) time.

Problem 2

Using MPI, implement parallel sample sort by regular sampling (PSRS) algorithm. Test your algorithm with different numbers of keys (N), data types (integer, float, double) and processor combinations and report your results in a table like the one shown below.

| N | T^* (best seq qsort) | T_2 | T_4 | T_8 | T_{16} |
|---|------------------------|-------|-------|-------|----------|
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Please note the following:

- For each data type (int, float, double), prepare a table like the one shown above.
- You should generate input data by using a random number generator.
- Your algorithm should work for any number of processors.