Problem 1. Consider the merging problem in our PRAM discussion. Let A_1 be the array $(1, 17, 28, 29, 55, 61, 69, 80)$ and A_2 be the array $(10, 13, 25, 33, 38, 56, 72, 75)$. Give the content of array B_1.

Problem 2. Consider the sorting problem in EM. Let A be the input file of n integers (which is stored in $O(n/B)$ blocks). Give an algorithm to produce $O(n/M)$ files satisfying all the following requirements:

- Each file stores at most M integers of A in ascending order using $O(M/B)$ blocks.
- All the files are mutually disjoint.
- The union of all the files is the set of integers in A.

Your algorithm must terminate in $O(n/B)$ I/Os.

Problem 3. This question concerns the PRAM model. Suppose that we have already obtained a sorting algorithm $\mathcal{A}$ finishing in $f(n)$ steps when the number p of CPUs equals n (recall that n is the number of integers to sort). Consider now the scenario where $p < n$. Describe how to use $\mathcal{A}$ to design an algorithm that finishes in $O(\frac{n}{p} \cdot f(n))$ steps.

Problem 4. Give a PRAM algorithm that settles the sorting problem in $O(\frac{n}{p} \log^2 n)$ steps.