

King Saud University
College of Computer and Information Sciences
Department of Computer Science
CSC453 – Parallel Processing – Tutorial No – Spring 2022

Question

1. Let's consider that we want to apply the bitonic *ascending* merge-sort algorithm on the following array:

5	3	18	12	6	10	14	4
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- a. Show all changes made on the array during *step 1* of the algorithm.
 - b. Which threads will be involved in this *step 1* in case the algorithm is performed in parallel. Don't forget to specify, for every thread, the index of the cells it will process.
 - c. Show all changes made on the array during *stage 1 of step 2* of the algorithm.
 - d. Which threads will be involved in this *stage 1 of step 2* in case the algorithm is performed in parallel. Don't forget to specify, for every thread, the index of the cells it will process.
2. Give the number of steps that are required to sort elements of an array of size N .
3. Give the number of stages that are required in a given step i .
4. Give the size of bitonic sequences in a given stage j of a step i .
5. Give the condition that should satisfy a thread to participate in the processing of bitonic sequences of a stage j of a step i .
6. Give the condition that should satisfy a thread that participates in the processing of sequences of a stage j of a step i to sort its corresponding bitonic-sequence ascendingly.