

Lab Session 04

Home exercises

1. **[5p]** Group the elements numbered $\{0, 2w, 4w \dots N\}$ in **P** groups.
 - Here **N** is a power of 2, if you need so can **w**
 - You will need formulas that identify the first and last element of each group.
 - **Tid** represents the group identifier.
2. **[5p]** Write two sorting functions.
 - The first function sorts all the elements in row *i* of a matrix.
 - The second function sorts all the elements in a column *j* of a matrix.
 - You can make use of `qsort`.

Lab Exercises

1. **[10p]** Parallelize the **Merge Sort** algorithm.
 - **Hint:** Watch out for the interchange between *v* and *vNew*.
 - **Hint:** Do all frames need to perform merge in the last steps? Rounding start/end formulas to a multiple of $2 \cdot \text{width}$ is a nice trick.
2. **[10p]** Stress test your solution and show its scalability.
3. **[20p]** Starting from Bubble Sort build the parallel version of the **Odd-Even Transposition Sort** algorithm.
4. **[10p]** Stress test your solution and show its scalability.
5. **[10p]** Build the **sequential** version of the **Row-Column Sort** algorithm.
6. **[20p]** **Parallelize** the **Row-Column Sort** algorithm.
7. **[10p]** Stress test your solution and show its scalability.