DV2575 Project-1: Odd-Even Sort

In this project, you will build sorting tool by using the odd-even algorithm. This tool is used to sort a sequence of randomly generated numbers (i.e., integers).

In computing, an odd–even sort is a comparison sort related to bubble sort. It functions by comparing all odd/even-indexed pairs of adjacent elements in the unsorted list of numbers.

Specifically, the comparison goal is to make each pair of numbers in the expected order (e.g., the first number is smaller than the second one) by doing switch operation. Further, such comparison needs to be conducted by following two rules until the list is fully sorted. These two rules are:

- Repeating the comparison operation for each even(/odd)-indexed pairs, and ii)
- Alternating the comparison operation between odd->even and even->odd steps.

The project is divided into four iterations, where each has to be finished and approved before you are allowed to go ahead with the upcoming iteration.

Iteration

- Generate a sequence of random integers.
- Implement the single thread based odd-even sorting
- Implement the parallel odd-even sorting by using CUDA programming
- Record the time used for sorting in two implementation, and compare them
- For the parallel sorting, performance analysis showing how the following factors affect the performance:
    - Number of integers for sorting.
    - Number of threads for sorting.
    - Number of sub-thread for sorting (extra.)

Final report

The project solution shall finally be documented in an academic written report. You have to cover and explain each implementation step and the performance analysis in a well structured and understandable way.

Questions?

Feel free to ask Yong Yao (in person, will not answer by e-mail!). Lars Lundberg will answer questions regarding the course in general.
Good Luck!