Universidade de Aveiro

Mestrado em Engenharia de Computadores e Telemática

Arquitecturas de Alto Desempenho

Assignment 2 – Sorting Sequences of Values

Academic year 2022/2023

INTRODUCTION

Sorting sequences of values is a very time consuming task. Two versions of doing this, based on the bubble sort algorithm, are presented. The difference between them is how the data is stored in memory. In the first, the sequence elements are seen as forming the rows of a matrix, each row corresponding to a different sequence to be sorted. In the second, the sequence elements are seen as forming the columns of a matrix, each column corresponding to a different sequence to be sorted.

The code for each case is given and can be used to assess the execution times of running the sorting algorithms both in a CPU and a GPU.

GRADING

- Optimize the launch configuration for each case, explain how good the mapping between each running thread and the memory region it accesses is and draw conclusions about the usefulness of offloading the computation to the GPU – 13 points
- Sketch (do not write code for it) how the program that is given could be changed if instead of having multiple sequences to be sorted, one has a single sequence whose length is equal to the sum of the lengths of the multiple sequences – 17 points.

DELIVERABLES

- a pdf file, named `SSV_T$G#.pdf` (where $, equal to 1, … ,4, means the lab number and #, equal to 1, …, 9, means the group number), having up to 6 power point like pages, where the main ideas of the design and the conclusions of the work are presented.

DEADLINE

- January, 2, at midnight.