
Introduction to CUDA Parallel Programming

Homework Assignment 2

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1 README

This file is `report.pdf`. `vecMaxAbs.cu` is the source code. `result.txt` is the execution result.

Executing `make` to compile the program.

The program usage is `./vecMaxAbs <gpu_id> <block_size> <grid_size>`. For example, `./vecMaxAbs 0 1024 256` will use gpu id 0 and set the block size to 1024 and the grid size to 256. The `vecMaxAbs` program will find the maximum of the absolute value of an array of real numbers and outputs GPU and CPU processing time and results.

2 Result

`result.txt` is the result of running `./vecMaxAbs 0 1024 1024` on `twqcd80`, where 1024 and 1024 are the optimal block size and grid size that I found.

3 Discussion

I determined the optimal block size and grid size by executing the program with several different block size and grid size combinations. I found that block size 1024, which is the largest block size, is always the optimal. However, smaller or bigger grid size will increase the total GPU processing time. I think the reason is larger block size means less total number of blocks, so the processing time can be reduced. Smaller grid size result worse performance since the total number of grids increase and only one grid is executed at any time. Larger grid size means that the CPU needs to add more numbers to get the result after the GPU computing. Both will increase the total processing time.