HW4 Report

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1. Description

Under the ”b10505047_HW4” directory, my source code is in vecDot_ngpu.cu, and the results that I tested are put under the “results” directory. There are 7 input files Input_16, Input_32, …, Input_1024 and 7 output files Output _16, Output _32, …, Output_1024. The numbers in files’ names represents the block size 16, 32, …, 1024. To run the code, run “make” first and then run “condor_submit cmd” to submit the job. Go to the “cmd” file, then you can change “Initialdir” into your working directory and “Arguments” into different input and output files’ names.

2. Results

I mainly tested block size = 16, 32, 64, 128, 256, 512, 1024. The result is shown in the figure below. Determined by the performance of “processing time for GPU” and “speedup”, the optimal block size and grid size that I tested is block size = 128, with grid size = 160000. I tested each input case for several times for a more reliable result.

grid size	1024	512	256	128	64	32	16
Processing time for GPU(ms)	4.437504	3.131616	2.603136	2.755424	2.127712	2.859744	5.860448
Speedup	1.000653	0.703693	0.751836	1.061935	0.901133	0.768792	0.590399

3. Discussion

According to the results that I tested, performance of cases of grid size = 64, 128, 256 is pretty close. In addition, the reason why I didn’t use “total time for GPU” for determine the optimal block size is because it mostly depends on data input and output time, and those two changes dramatically every time I tested. At last, I discovered that the speedup for most cases is < 1. I think it may be concerned with the value of N and the large data input and output time.