CUDA
Assignment 1

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1 CPU Calculation

Please see `cpu_funcs.cu` for implementation. `./matrix` accepts parameters:

- `-n [num_rows]` specify number of rows

- `-m [num_cols]` specify number of cols

- `-b [block_size]` specify block size.

- `-t` display the time?

- `-r` seed with random value?

2 Parallel Implementation

Please see `gpu_funcs.cu` for kernels. Use `-t` when running `./matrix` to display the CPU vs GPU times and speedups.

`vector_reduction_GPU` contains two internal kernel calls to `reduce0_GPU` and `reduce1_GPU`.

3 Performance Improvement

Rowsum speedup vs CPU

Block size	n,m = 1000	n,m = 5000	n,m = 10000	n,m = 25000
4	291	4826	20144	120456
8	291	4826	20144	120456
8	291	4826	20144	120456
8	291	4826	20144	120456
8	291	4826	20144	120456
8	291	4826	20144	120456
8	291	4826	20144	120456

Colsum speedup vs CPU

Block size	n,m = 1000	n,m = 5000	n,m = 10000	n,m = 25000
4	1653	51842	279702	3697568
8	291	4826	20144	120456
8	291	4826	20144	120456
8	291	4826	20144	120456
8	291	4826	20144	120456
8	291	4826	20144	120456
8	291	4826	20144	120456