



University of Nevada, Reno

Programming Assignment # 6

Roger's Absurdly Contrived Eleventh Hour Assignment

Assigned Date

10/11/2011

Due Date

Limit x as x approaches 10/18/2011 12:30:00.00PM PST from 1/1/1970 00:00:00UTC

Overview

For this assignment, you'll use streams and asynchronous data transfers for little or no gain. This problem is derived from <http://projecteuler.net/problem=6>

"The sum of the squares of the first ten natural numbers is,

$$1^2 + 2^2 + \dots + 10^2 = 385$$

The square of the sum of the first ten natural numbers is,

$$(1 + 2 + \dots + 10)^2 = 55^2 = 3025$$

Hence the difference between the sum of the squares of the first ten natural numbers and the square of the sum is $3025 - 385 = 2640$.

Find the difference between the sum of the squares of the first one hundred natural numbers and the square of the sum."

Make your program find the difference between the sum of the squares of the first N natural numbers and the square of the sum. Also, even though there's a formula $N(N-1)/2$, don't use that. Do it the stupid way. I told you it was contrived.

Use one stream for the sum of squares and another stream for the square of sums (or really, just the sums, then square it on the host). Asynchronously copy the results back to the host, twiddle your thumbs until you get the results, then print out the final answer.

Project Requirements

- Implement a host version

- Implement a single stream CUDA version
- Implement a dual stream CUDA version
- CUDA versions should use shared memory to do the reductions
- A writeup with graphs including time and throughput comparing the CPU and both GPU versions in terms of performance.

Recommendations

- You don't need to actually store the sequences. Just sum the indices.
- You might want to use unsigned longs. Them squares get mighty big.

Deliverables

- Bring code and output to class for discussion.
- Have a pdf of your writeup and a zip of your source code emailed to: Fred Harris and Lee Barford. Don't send binaries.
 - Firstname dot Lastname at (Fred is cse, Lee is gmail)