Programming Assignment 4

Due date: 11:59:59PM 05/01/2018

Scan is one of the most important operations in parallel computing. In this assignment, you'll implement the all-prefix-sums operation (i.e., exclusive scan with addition as the binary operation). For an input array $[a_0, a_1, a_2, \ldots, a_{n-1}]$, the output array should be $[0, a_0, a_0+a_1, a_0+a_1+a_2, \ldots, (a_0+a_1+\ldots+a_{n-2})]$.

What you need to do:

All your code should be in one file named homework4_FirstName_LastName.cu. I should see no compilation errors if I do:

```
nvcc homework4_FirstName_LastName.cu –o homework4 –arch=sm_35 -D_FORCE_INLINES
```

The executable should 1) take a positive integer N as an argument, 2) create an input integer array of size N, 3) populate the array with random integers from the range [1,1000], 4) compute the scan output array A_cpu in sequential on the CPU, 5) compute the scan output array A_gpu on the GPU, and 6) compare A_cpu and A_gpu.

What to submit:

Submit your CUDA file named homework4_FirstName_LastName.cu in Canvas.

How do I grade your submission:

30%: compilation pass

70%: correctness

The five fastest implementations will get 10% bonus points.

If your code cannot pass compilation, you get 0 points.

I may use a very large value for N.