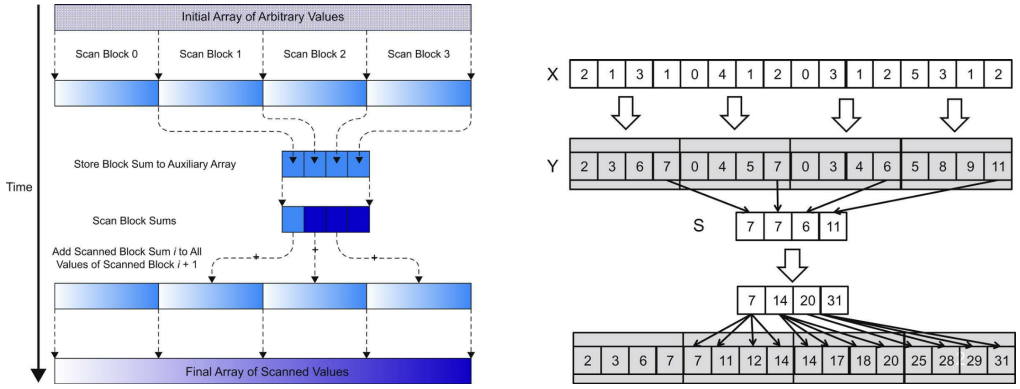
Homework 3

CSc 8530 Parallel Algorithms
Spring 2020

Due: 11:59pm, April 19th, 2020
Groups of 2 or 3

1. **(50 pts)** Write a CUDA program for calculating the prefix sums of an arbitrary-length array as described in Section 8.6 of the Kirk and Hwu book. You should follow their code snippets and input/output conventions.



Figs. 8.8 and 8.9 in Kirk and Hwu: Hierarchical prefix sums

Extra credit: (20 pts) Write a CUDA program to implement the single-pass scan version of the hierarchical prefix sum algorithm as discussed in Section 8.7 of Kirk and Hwu.

2. **(30 pts)** Write a CUDA program for doing *nearest-neighbor interpolation*. This program should receive as input an $n \times m$ image and the upsampling factor k (an integer). Note that the resulting image will be $kn \times km$ and should look blocky.