CMPS 224/396AA: GPU COMPUTING
ASSIGNMENT 7

In this assignment, you will implement an exclusive scan kernel using the Brent-Kung method.

Instructions

1. Place the files provided with this assignment in a single directory. The files are:
    - `main.cu`: contains setup and sequential code
    - `kernel.cu`: where you will implement your code (you should only modify this file)
    - `common.h`: for shared declarations across `main.cu` and `kernel.cu`
    - `timer.h`: to assist with timing
    - `Makefile`: used for compilation

2. Edit `kernel.cu` where TODO is indicated to implement the scan and add kernels. Please take note of the following:
    - You must implement the Brent-Kung exclusive scan. No credit will be given for implementing Kogge-Stone, or inclusive Brent-Kung with shifted inputs.
    - Your kernel is expected to work for any set of input dimensions so make sure to handle boundary conditions correctly.
    - Your code should be optimized by using shared memory and re-indexing threads to minimize control divergence.
    - You do not need to apply thread coarsening.

3. Compile your code by running: `make`

4. Test your code by running: `./scan`
    - If you are using the HPC cluster, do not forget to use the submission system. Do not run on the head node!
    - For testing on different input sizes, you can provide your own values for input size as follows: `./scan <N>`

Submission
Submit your modified `kernel.cu` file via Moodle by the due date. Do not submit any other files or compressed folders.