CME213, Spring 2022
Parallel Computing
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Homework 4: CUDA GPU Matrix Operations

Problem 1: Recurrence Implement a simple CUDA program for a recurrence relation (inspired by the Mandelbrot Set) for many different starting points.

- **1.1: Allocate GPU memory.** Idea: Use `cudaMalloc` to allocate memory on the GPU device for both the input and output arrays we will need for the recurrence implementation. Free memory with `cudaFree` at end of `main()`.

```
// Allocate num_bytes of memory to the device arrays
cudaMalloc(&device_input_array, num_bytes);
cudaMalloc(&device_output_array, num_bytes);
...
...

// Deallocate memory from both device arrays
cudaFree(device_input_array);
cudaFree(device_output_array);
```

Submission information logs.

```
jelc@cardinal2:~$ /afs/ir.stanford.edu/class/cme213/script/submit.py hw3 private/cme213-
Submission for assignment 'hw3' as user 'jelc'
Attempt 2/10
Time stamp: 2022-05-01 21:36
List of files being copied:
    private/cme213-jelc53/hw3/main_q1.cu  [13253 bytes]
    private/cme213-jelc53/hw3/recurrence.cuh  [1589 bytes]
    private/cme213-jelc53/hw3/pagerank.cuh  [5894 bytes]
    private/cme213-jelc53/hw3/benchmark.cuh  [795 bytes]

Your files were copied successfully.
Directory where files were copied: /afs/ir.stanford.edu/class/cme213/submissions/hw3/jel
List of files in this directory:
    main_q1.cu  [13253 bytes]
    recurrence.cuh  [1589 bytes]
    pagerank.cuh  [5894 bytes]
    benchmark.cuh  [795 bytes]
    metadata  [137 bytes]

This completes the submission process. Thank you!
```

```
jelc@cardinal2:~$ ls /afs/ir.stanford.edu/class/cme213/submissions/hw3/jelc/2
benchmark.cuh  main_q1.cu  metadata  pagerank.cuh  recurrence.cuh
```