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Global and constant memory can get from the host. Shared mem is in each block, higher speed. Divide global mem into tile and load into chip. Barrier synchron: at first and after calculation ensures elements are used in each thread.

Process:Each thread load one element in each matrix and calculate inner product in each iteration Boundary 2d matrix index exceeds width (notify multiplication’s row and column) true load element else load 0.

Embarrassingly Parallel Computation: Be done in completely independent parts can be done in each threads. Operation: x’ = xcos + ysin, y’ = -xsin + ycos;

Monte Carlo Method: large dataset and draw identical samples and independent. Advantage: Error reduced to 1/sqrtn. Work with parallelism. Find estimation faster.

Random Number Generation: impossible to generate actual random one on deterministic machine. Usually generate x and x\_i+1 = (axi+c) mod m

cuRAND: Timing: clock\_t start & stop, in device returns the value of a per-multiprocessor counter that is incremented every clock cycle.

Parallel algorithms time depends on input size, communication, processors, architecture.

Speedup Factor: p = number of pro S(p) = time using one / time using multiple.

Time component: inherently sequential cop, parallel comp, communication.

Efficiency: S(p)/ p

Amdahl’s law: just ignores commu time to calculate maximum speed up.

Gustafson-Barsis’s law: predict scaled speedup