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Assignment B Program Specifications

3/7/15

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This program calculates the CVA of a synthetic bank. Parameters for the program can be changed in the *parameters.txt* file. The current FX rate can be changed in the *state0.txt* file. The *state0.txt* file is intended for non-sophisticated front end users to change as needed. A slightly more sophisticated user can change the program parameters in *parameters.txt*. I chose to put the input parameters in parameter files instead of command line options to make it easier for front end users to run the program.

The program runs in “parallel/parallel” meaning that the Monte Carlo paths are run on multiple GPUs and the CVA for the vector of counterparties along each path is calculated in parallel on each GPU. The program uses Openmp along with CUDA Thrust to achieve this “parallel/parallel” CVA calculation. The *cva.cu* program takes full advantage of the hardware by automatically detecting the number of GPUs available for usage and splitting up simulation paths among the GPUs accordingly.

The program also detects the amount of memory on the GPU and decides the number of deals to process in one run. This vastly speeds up the CVA calculation time.

To run the program type

make

This compiles both the *generate\_data.cpp* program and the *cva.cu* program.

./generate\_data.out

This generates the data for the synthetic bank.

qsub job\_submit.script

This sends a job request to run the *cva.out* file.

The output of the program is printed to *cva\_output.txt*.

The logging for the program is printed to *logging.txt*.