Programming Assignment #3

- Matrix-Matrix Multiplication with CUDA

H. Kim  
(hjunkim@skku.edu)

College of Information and Communication Engineering  
Sungkyunkwan University
Programming Assignment

• Matrix-Matrix Multiplication
  • C version without CUDA
  • CUDA version

• Command Line Arguments
  • Two input files: matrix1 & matrix2
  • First line specifies the size of matrix
    • E.g. 10 4 (#rows, #columns for matrix)
  • The rest of the lines specify the contents line by line
CUDA

• Helpful References

  • [http://docs.nvidia.com/cuda/cuda-c-programming-guide/#axzz49Tu1zVE5](http://docs.nvidia.com/cuda/cuda-c-programming-guide/#axzz49Tu1zVE5)

  • Google! or Naver!
GPGPU-Sim

- Cycle accurate GPU simulator
  - CUDA & OpenCL
  - Fermi architecture
  - http://www.gpgpu-sim.org/
  - (git) https://github.com/gpgpu-sim/gpgpu-sim_distribution
Before Build

- gcc/g++ 4.5.1(4.4.7), bison 2.4.1, flex 2.5.35, CUDA Toolkit 4
- $git clone https://github.com/gpgpu-sim/gpgpu-sim_distribution.git
- $sudo apt-get install build-essential xutils-dev bison zlib1g-dev flex libglu1-mesa-dev
- $sudo apt-get install doxygen graphviz
- $sudo apt-get install python-pmw python-ply python-numpy libpng 12-dev python-matplotlib
- $sudo apt-get install libxi-dev libxmu-dev libglut3-dev
Before Build (Cont.)

  • CUDA Toolkit for Ubuntu Linux 10.10 (32/64-bit)
  • Before run the install script, “$sudo service lightdm stop”

• Ensure CUDA_INSTALL_PATH is set to the location where you installed the CUDA Toolkit (e.g. /usr/local/cuda)
  • modify .bashrc file
    • export CUDA_INSTALL_PATH=/usr/local/cuda
    • export PATH=$PATH:$CUDA_INSTALL_PATH/bin
    • export LD_LIBRARY_PATH=/usr/local/cuda/lib64:/usr/local/cuda/lib
Build

• source setup_environment

• make
Run

• nvcc --arch=sm_20 application.cu –o application

• cp {GPGPU-Sim dir}/configs/GTX480/* ./

• source {GPGPU-Sim dir}/setup_environment

• ./application

If you see it setting is now done!
Results

• C Version & CUDA Version Outputs
  • C_out.txt, CUDA_C_out.txt

• diff C_out.txt Cuda_C_out.txt
Submission

• Due date
  • Posted on class web page
  • Delayed submission: 10% per day, up to 50% of your score

• <student_id>.{tar/tar.gz/zip}
  • C only source code & C with CUDA source code
  • Makefile
  • Readme.txt – how to build & run your code, and description of your CUDA code
  • Test input files

• Submit through the icampus