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ECE 4930-004

**HW3**

***Part 1: Installing FlipIt***

[epaulz@login001 matmul]$ ./long

Fault injector seed: 533

Starting faulty computation.

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/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Start\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

Successfully injected Integer Data error!!

Rank: 0

Total # faults injected: 1

Bit position is: 27

Index of the fault site: 58

Fault site probability: 1.000000e-08

Chosen random probability is: 9.794167e-09

Attempts since last injection: 8113437

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*End\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

Number of incorrect elements: 1

[epaulz@login001 matmul]$

***Part 2: Compile HPCCG***

[epaulz@login001 HPCCG-1.0]$ qsub -I -l select=1:ncpus=2:mem=4gb,walltime=0:05:00

qsub (Warning): Interactive jobs will be treated as not rerunnable

qsub: waiting for job 4493616.pbs02 to start

qsub: job 4493616.pbs02 ready

[epaulz@node0040 hw3-4930]$ cd HPCCG-1.0/

[epaulz@node0040 HPCCG-1.0]$ module load gcc/4.8.1

[epaulz@node0040 HPCCG-1.0]$ module load mpich

[epaulz@node0040 HPCCG-1.0]$ make

make: `test\_HPCCG' is up to date.

[epaulz@node0040 HPCCG-1.0]$ mpirun -n 8 ./test\_HPCCG 32 32 32

Initial Residual = 1944.57

Iteration = 15 Residual = 18.1609

Iteration = 30 Residual = 0.043237

Iteration = 45 Residual = 0.000160905

Iteration = 60 Residual = 7.41837e-07

Iteration = 75 Residual = 3.07385e-09

Iteration = 90 Residual = 1.42189e-11

Iteration = 105 Residual = 5.99938e-14

Iteration = 120 Residual = 2.62093e-16

Iteration = 135 Residual = 5.8031e-19

Iteration = 149 Residual = 1.20172e-21

Mini-Application Name: hpccg

Mini-Application Version: 1.0

Parallelism:

Number of MPI ranks: 8

OpenMP not enabled:

Dimensions:

nx: 32

ny: 32

nz: 32

Number of iterations: : 149

Final residual: : 1.20172e-21

\*\*\*\*\*\*\*\*\*\* Performance Summary (times in sec) \*\*\*\*\*\*\*\*\*\*\*:

Time Summary:

Total : 2.50991

DDOT : 0.0943384

WAXPBY : 0.0952797

SPARSEMV: 2.30469

FLOPS Summary:

Total : 2.49981e+09

DDOT : 1.56238e+08

WAXPBY : 2.34357e+08

SPARSEMV: 2.10921e+09

MFLOPS Summary:

Total : 995.972

DDOT : 1656.14

WAXPBY : 2459.67

SPARSEMV: 915.181

DDOT Timing Variations:

Min DDOT MPI\_Allreduce time: 0.0207698

Max DDOT MPI\_Allreduce time: 0.0575371

Avg DDOT MPI\_Allreduce time: 0.0401485

SPARSEMV OVERHEADS:

SPARSEMV MFLOPS W OVERHEAD: 903.591

SPARSEMV PARALLEL OVERHEAD Time: 0.0295603

SPARSEMV PARALLEL OVERHEAD Pct: 1.26637

SPARSEMV PARALLEL OVERHEAD Setup Time: 0.0174501

SPARSEMV PARALLEL OVERHEAD Setup Pct: 0.747567

SPARSEMV PARALLEL OVERHEAD Bdry Exch Time: 0.0121102

SPARSEMV PARALLEL OVERHEAD Bdry Exch Pct: 0.518805

[epaulz@node0040 HPCCG-1.0]$

***Part 3: Instrument HPCCG for Fault Injection***

[epaulz@node0068 HPCCG-1.0]$ mpirun -n 8 ./test\_HPCCG 32 32 32 --stateFile /home/epaulz/hw3-4930/FlipIt//.HPCCG --numberFaulty 1 --faulty 2 29634

Fault injector seed: 233

Initial Residual = 1944.57

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*Start\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

Successfully injected Converted Pointer error!!

Rank: 2

Total # faults injected: 1

Bit position is: 47

Index of the fault site: 33196

Fault site probability: 1.000000e-08

Chosen random probability is: 4.862908e-09

Attempts since last injection: 292195571

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*End\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

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= BAD TERMINATION OF ONE OF YOUR APPLICATION PROCESSES

= PID 495 RUNNING AT node0068.palmetto.clemson.edu

= EXIT CODE: 139

= CLEANING UP REMAINING PROCESSES

= YOU CAN IGNORE THE BELOW CLEANUP MESSAGES

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YOUR APPLICATION TERMINATED WITH THE EXIT STRING: Segmentation fault (signal 11)

This typically refers to a problem with your application.

Please see the FAQ page for debugging suggestions

[epaulz@node0068 HPCCG-1.0]$

***Part 4: Conduct a Fault Injection Campaign***

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***Part 5: Installing FaultSight***

***Part 6: Fault Injection Analysis with FaultSight***