Lab4 Cuda report

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Lab4 outcome: (affect rate=0.04,0.03 , epsilon=0.04,0.03)

Serial outcome:

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Dissipation converged in 460838 iterations.
With max DSV = 0.085007 and min DSV = 0.082457.
Affect rate = 0.030000; Epsilon: 0.030000.
Elapsed convergence loop time (clock) : 364570000.
Elapsed convergence loop time (time) : 365.
Elapsed convergence loop time (chrono) : 364742.00.
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Dissipation converged in 326521 iterations.
With max DSV = 0.084885 and min DSV = 0.082338.
Affect rate = 0.040000; Epsilon: 0.030000.
Elapsed convergence loop time (clock) : 280170000.
Elapsed convergence loop time (time) : 281.
Elapsed convergence loop time (chrono) : 280245.00.
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Dissipation converged in 280111 iterations.
With max DSV = 0.085120 and min DSV = 0.081715.
Affect rate = 0.040000; Epsilon: 0.040000.
Elapsed convergence loop time (clock) : 265670000.
Elapsed convergence loop time (time) : 266.
Elapsed convergence loop time (chrono) : 266102.00.
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Cuda outcome:

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Threads requested: 17.
Dissipation converged in 462542 iterations.
With max DSV = 0.085007 and min DSV = 0.082457.
Affect rate = 0.030000; Epsilon: 0.030000.
Elapsed convergence loop time (clock) : 97790000.
Elapsed convergence loop time (time) : 98.
Elapsed convergence loop time (chrono) : 97763.015625.
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Threads requested: 17.
Dissipation converged in 326515 iterations.
With max DSV = 0.084884 and min DSV = 0.082337.
Affect rate = 0.040000; Epsilon: 0.030000.
Elapsed convergence loop time (clock) : 69180000.
Elapsed convergence loop time (time) : 70.
Elapsed convergence loop time (chrono) : 69148.632812.
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Threads requested: 17.
Dissipation converged in 280135 iterations.
With max DSV = 0.085120 and min DSV = 0.081715.
Affect rate = 0.040000; Epsilon: 0.040000.
Elapsed convergence loop time (clock) : 60670000.
Elapsed convergence loop time (time) : 61.
Elapsed convergence loop time (chrono) : 60656.738281.
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–
a comparative summary of the run-time and Gflops/sec for both your serial and cuda parallel program versions.
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a description of any changes you elected to make to your serial program to enhance GPU performance, along with a summary of the performance impact of those changes.

For serial:

Affect rate = 0.03, epsilon = 0.03 Gflops/sec = 460838/365=1262.56986;
Affect rate = 0.04, epsilon = 0.03 Gflops/sec = 326521/281=1161.99644;
Affect rate = 0.04, epsilon = 0.04 Gflops/sec = 280111/266=1053.04887;

For cuda:

Affect rate = 0.03, epsilon = 0.03 Gflops/sec = 17*462542/98=80236.8776;
Affect rate = 0.04, epsilon = 0.03 Gflops/sec = 17*326515/70=79296.5;
Affect rate = 0.04, epsilon = 0.04 Gflops/sec = 17*280135/61=78070.4098;

I used complex data structure in serial version. In cuda, I turned all the data structure into several 1-D arrays and copy to device.