Lab2 Pthreads report

Sheng Ding, ding.853@osu.edu

1. Lab outcome: (affect rate=0.01, epsilon=0.01)

Serial:
****
Dissipation converged in 691841 iterations.
With max DSV = 0.085123 and min DSV = 0.082570.
Affect rate = 0.020000; Epsilon: 0.030000.
Elapsed convergence loop time (clock): 461180000.
Elapsed convergence loop time (time): 462.
Elapsed convergence loop time (chrono): 461168.00.

disposable_1(threads #)
****
Dissipation converged in 691853 iterations.
With max DSV = 0.085123 and min DSV = 0.082570.
Affect rate = 0.020000; Epsilon: 0.030000.
Elapsed convergence loop time (clock): 1200020000.
Elapsed convergence loop time (time): 1213.
Elapsed convergence loop time (chrono): 1213531.62.

disposable_2
****
Dissipation converged in 691853 iterations.
With max DSV = 0.085123 and min DSV = 0.082570.
Affect rate = 0.020000; Epsilon: 0.030000.
Elapsed convergence loop time (clock): 1034570000.
Elapsed convergence loop time (time): 721.
Elapsed convergence loop time (chrono): 720877.19.

disposable_3
****
Dissipation converged in 691853 iterations.
With max DSV = 0.085123 and min DSV = 0.082570.
Affect rate = 0.020000; Epsilon: 0.030000.
Elapsed convergence loop time (clock): 1080910000.
Elapsed convergence loop time (time): 515.
Elapsed convergence loop time (chrono): 515243.78.

disposable_4
****
Dissipation converged in 691853 iterations.
With max DSV = 0.085123 and min DSV = 0.082570.
Affect rate = 0.020000; Epsilon: 0.030000.
Elapsed convergence loop time (clock): 970880000.
Elapsed convergence loop time (time): 386.
Elapsed convergence loop time (chrono): 386353.12.

disposable_8:
****
Dissipation converged in 691853 iterations.
With max DSV = 0.085123 and min DSV = 0.082570.
Affect rate = 0.020000; Epsilon: 0.030000.
Elapsed convergence loop time (clock): 1295940000.
Elapsed convergence loop time (time): 329.
Elapsed convergence loop time (chrono): 328439.47.

disposable_16:
****
Dissipation converged in 691853 iterations.
With max DSV = 0.085123 and min DSV = 0.082570.
Affect rate = 0.020000; Epsilon: 0.030000.
Elapsed convergence loop time (clock): 1679640000.
Elapsed convergence loop time (time): 318.
Elapsed convergence loop time (chrono): 317735.44.

disposable_28:
****
Dissipation converged in 691853 iterations.
With max DSV = 0.085123 and min DSV = 0.082570.
Affect rate = 0.020000; Epsilon: 0.030000.
Elapsed convergence loop time (clock): 1825990000.
Elapsed convergence loop time (time): 459.
Elapsed convergence loop time (chrono): 458682.50.

persistent_1:
****
Dissipation converged in 691853 iterations.
With max DSV = 0.085123 and min DSV = 0.082570.
Affect rate = 0.020000; Epsilon: 0.030000.
Elapsed convergence loop time (clock): 543850000.
Elapsed convergence loop time (time): 544.
Elapsed convergence loop time (chrono): 543916.75.

persistent_2:
****
Dissipation converged in 691853 iterations.
With max DSV = 0.085123 and min DSV = 0.082570.
Affect rate = 0.020000; Epsilon: 0.030000.
Elapsed convergence loop time (clock): 676230000.
Elapsed convergence loop time (time): 425.
Elapsed convergence loop time (chrono): 425467.19.

persistent_3:
****
Dissipation converged in 691853 iterations.
With max DSV = 0.085123 and min DSV = 0.082570.
Affect rate = 0.020000; Epsilon: 0.030000.
Elapsed convergence loop time (clock): 652530000.
Elapsed convergence loop time (time): 308.
Elapsed convergence loop time (chrono): 307589.66.

persistent_4:
****
Dissipation converged in 691853 iterations.
With max DSV = 0.085123 and min DSV = 0.082570.
Affect rate = 0.020000; Epsilon: 0.030000.
Elapsed convergence loop time (clock): 708250000.
Elapsed convergence loop time (time): 278.
Elapsed convergence loop time (chrono): 277316.09.

persistent_8:
****
Dissipation converged in 691853 iterations.
With max DSV = 0.085123 and min DSV = 0.082570.
Affect rate = 0.020000; Epsilon: 0.030000.
Elapsed convergence loop time (clock): 698690000.
Elapsed convergence loop time (time): 181.
Elapsed convergence loop time (chrono): 181111.52.

persistent_16:
****
Dissipation converged in 691853 iterations.
With max DSV = 0.085123 and min DSV = 0.082570.
Affect rate = 0.020000; Epsilon: 0.030000.
Elapsed convergence loop time (clock): 869960000.
Elapsed convergence loop time (time): 180.
Elapsed convergence loop time (chrono): 180056.14.

persistent_28:
****
Dissipation converged in 691853 iterations.
With max DSV = 0.085123 and min DSV = 0.082570.
Affect rate = 0.020000; Epsilon: 0.030000.
Elapsed convergence loop time (clock): 1121480000.
Elapsed convergence loop time (time): 233.
Elapsed convergence loop time (chrono): 232986.55.

2. Did this program perform better sequentially or in parallel?
– Generally speaking, sequentially programs performed better than sequentially, but when the number of threads is small, parallel programs are slower than sequentially.

Which number of threads was most effective?
– In my outcome, 16 threads are most effective in both disposable and persistent.

Which parallel version (disposable or persistent) was most effective?
– Persistent.

How did your results match or conflict with your expectations?
– It matches my expectations.

Were there any unexpected anomalies in the timing information collected?
– No, there are not.

Which timing methods seem best for parallel programs? How does this compare with your expectations?
– I think persistent is more suitable than disposable. It accords my expectations.

3. Difference:
The values of Max_DSV and Min_DSV are same when reach the convergence, but the convergence iterations are different. The reason is that when affect rate and epsilon are too small, different threads blocks will affect each other.