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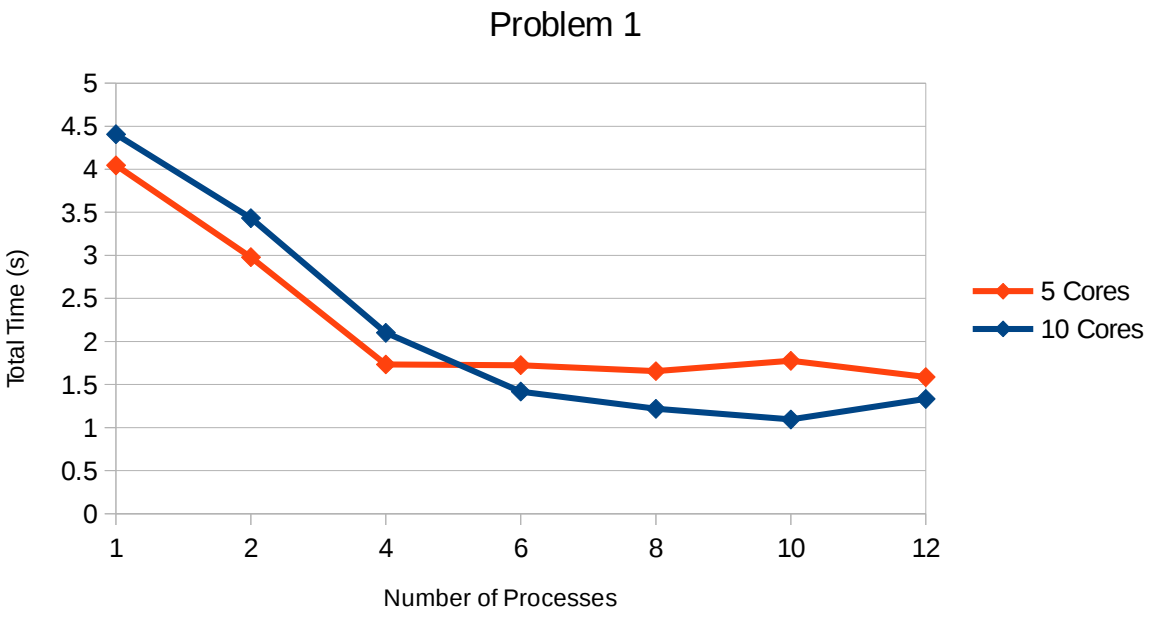
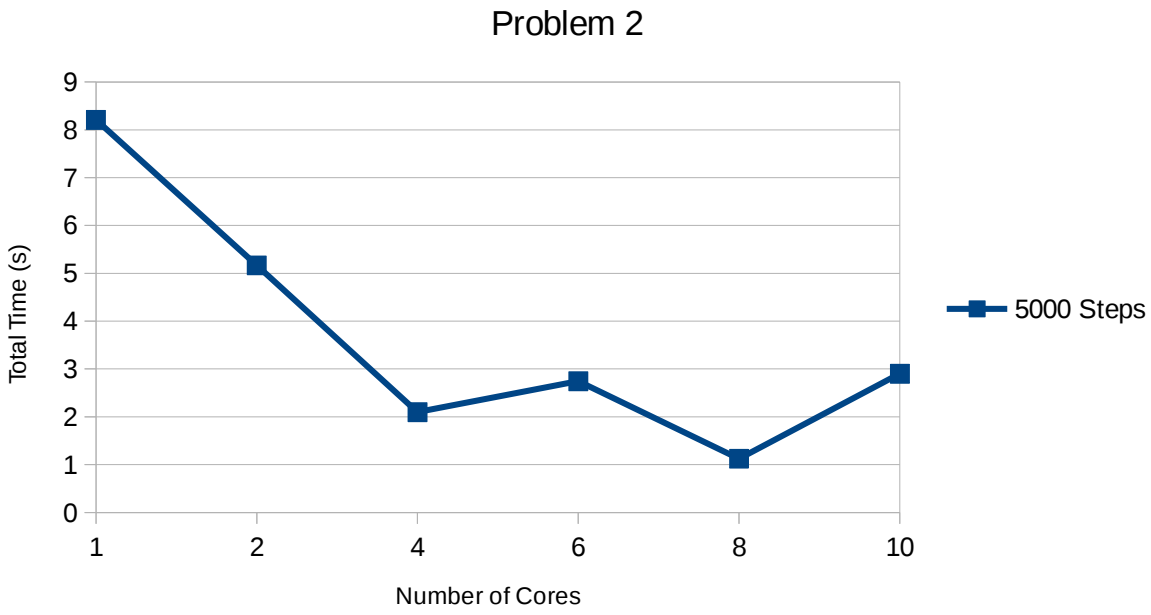
OS – HW9
11/16/16

Problem 1: Varying number of processes for five and ten cores



When the number of processes exceeds the number of cores, the parallel processing doesn't improve much. With five cores, the net time evened out around 4/6 processes, and with 10 cores, the total time consecutively fell until it reached 10 processes. Of course, the computation time can only be decreased so much anyway. With a higher number of processes, the higher number of cores helped speed up computation time, but for low numbers of processes, using fewer cores was actually faster.

Problem 2: Varying number of cores for Shubert runs



In general, more cores meant lower computation time—the 1, 2, and 4 cases look as expected—but the time curve wasn't as smooth for higher core counts. The 8-core case ran really fast.

Output

Problem 1

5 cores

1 process
5 cores available
Process 1 sum = 1000000000.
Total time was 4.045764 seconds.

2 processes
5 cores available
Process 2 sum = 500000000.
Process 1 sum = 500000000.
Total time was 2.978660 seconds.

4 processes
5 cores available
Process 4 sum = 250000000.
Process 3 sum = 250000000.
Process 2 sum = 250000000.
Process 1 sum = 250000000.
Total time was 1.733019 seconds.

6 processes
5 cores available
Process 6 sum = 166666666.
Process 5 sum = 166666666.
Process 4 sum = 166666666.
Process 3 sum = 166666666.
Process 2 sum = 166666666.
Process 1 sum = 166666666.
Total time was 1.724782 seconds.

8 processes
5 cores available
Process 8 sum = 125000000.
Process 7 sum = 125000000.
Process 6 sum = 125000000.
Process 5 sum = 125000000.
Process 4 sum = 125000000.
Process 3 sum = 125000000.
Process 2 sum = 125000000.
Process 1 sum = 125000000.
Total time was 1.655004 seconds.

10 processes
5 cores available
Process 10 sum = 100000000.
Process 9 sum = 100000000.
Process 8 sum = 100000000.
Process 7 sum = 100000000.
Process 6 sum = 100000000.
Process 5 sum = 100000000.
Process 4 sum = 100000000.
Process 3 sum = 100000000.
Process 2 sum = 100000000.
Process 1 sum = 100000000.
Total time was 1.775499 seconds.

#12 processes
5 cores available
Process 12 sum = 83333333.
Process 11 sum = 83333333.
Process 10 sum = 83333333.
Process 9 sum = 83333333.
Process 8 sum = 83333333.
Process 7 sum = 83333333.
Process 6 sum = 83333333.
Process 5 sum = 83333333.
Process 4 sum = 83333333.
Process 3 sum = 83333333.
Process 2 sum = 83333333.
Process 1 sum = 83333333.
Total time was 1.585887 seconds.

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10 cores

1 process
10 cores available
Process 1 sum = 1000000000.
Total time was 4.407255 seconds.

2 processes
10 cores available
Process 2 sum = 500000000.
Process 1 sum = 500000000.
Total time was 3.432133 seconds.

4 processes
10 cores available
Process 4 sum = 250000000.
Process 3 sum = 250000000.
Process 2 sum = 250000000.
Process 1 sum = 250000000.

Total time was 2.100654 seconds.

6 processes
10 cores available
Process 6 sum = 166666666.
Process 5 sum = 166666666.
Process 4 sum = 166666666.
Process 3 sum = 166666666.
Process 2 sum = 166666666.
Process 1 sum = 166666666.
Total time was 1.418506 seconds.

8 processes
10 cores available
Process 8 sum = 125000000.
Process 7 sum = 125000000.
Process 6 sum = 125000000.
Process 5 sum = 125000000.
Process 4 sum = 125000000.
Process 3 sum = 125000000.
Process 2 sum = 125000000.
Process 1 sum = 125000000.
Total time was 1.218590 seconds.

10 processes
10 cores available
Process 10 sum = 100000000.
Process 9 sum = 100000000.
Process 8 sum = 100000000.
Process 7 sum = 100000000.
Process 6 sum = 100000000.
Process 5 sum = 100000000.
Process 4 sum = 100000000.
Process 3 sum = 100000000.
Process 2 sum = 100000000.
Process 1 sum = 100000000.
Total time was 1.094810 seconds.

12 processes
10 cores available
Process 12 sum = 83333333.
Process 11 sum = 83333333.
Process 10 sum = 83333333.
Process 9 sum = 83333333.
Process 8 sum = 83333333.
Process 7 sum = 83333333.
Process 6 sum = 83333333.
Process 5 sum = 83333333.
Process 4 sum = 83333333.
Process 3 sum = 83333333.
Process 2 sum = 83333333.
Process 1 sum = 83333333.
Total time was 1.332703 seconds.

Problem 2

1 core
1 cores available
Total time was 8.208597 seconds.
min = -186.73

2 cores
2 cores available
Total time was 5.164733 seconds.
min = -186.73

4 cores
4 cores available
Total time was 2.098214 seconds.
min = -186.73

6 cores
6 cores available
Total time was 2.743548 seconds.
min = -186.73

8 cores
8 cores available
Total time was 1.122439 seconds.
min = -186.73

#10 cores
10 cores available
Total time was 2.899560 seconds.
min = -186.73