EECS-358 ASSIGNMENT 1

Problem 1:

a) 2*m*n

b) (2*m*n)/p, where p is the number of processors

c) Sp = 2*m*n/2*m*n/p = p

Alpha = (p^2 - n)/(2n*(p - 1))

d) Sp is a factor of the number of processors. As p-> infinity, Sp-> infinity. The algorithm is effective.

Problem 2:

Time for Pi:

12.794u 0.000s 0:12.79 100.0% 0+0k 0+0io 0pf+0w

Time for Pi2:

1 processor: 13.638u 0.000s 0:13.64 99.9% 0+0k 0+0io 0pf+0w

4 processors: 15.795u 0.092s 0:03.98 398.9% 0+0k 0+0io 0pf+0w

8 processors: 20.620u 0.579s 0:02.69 787.7% 0+0k 0+0io 0pf+0w

Time for Pi1:

Static:

1 processor: 13.400u 0.000s 0:13.40 100.0% 0+0k 0+0io 0pf+0w

4 processors: 13.397u 0.002s 0:03.35 399.7% 0+0k 0+0io 0pf+0w

8 processors: 13.299u 0.001s 0:01.67 795.8% 0+0k 0+0io 0pf+0w

Dynamic:

1 processor: 44.666u 0.001s 0:44.67 99.9% 0+0k 0+0io 0pf+0w

4 processors: 598.224u 0.074s 2:29.60 399.9% 0+0k 0+0io 0pf+0w

8 processors: 1064.632u 0.077s 2:13.24 799.0% 0+0k 0+0io 0pf+0w

Time for Multdot:

1 processor: 2.343u 1.002s 0:03.34 100.0% 0+0k 0+0io 0pf+0w

4 processors: 2.401u 1.047s 0:03.45 99.7% 0+0k 0+0io 0pf+0w

8 processors: 2.395u 0.992s 0:03.39 99.7% 0+0k 0+0io 0pf+0w

Problem 3:

Time for OpenMP:

N = 1024:

1 processor : 3960.95 ms

4 processors: 1434.25 ms

8 processors: 815.84 ms

N = 5000:

1 processor : 473915 ms

4 processors: 128520 ms

8 processors: 111758 ms

Time for Pthreads:

N = 1024:

1 processor: 3853.41 ms.

4 processors: 1069.88 ms.

8 processors: 865.259 ms.

N = 5000:

1 processor:419031 ms.

4 processors: 106786 ms.

8 processors: 84464.4 ms.