

1)

Pi value is estimated solving Buffon's needle problem using OpenMp. Speed of a parallel program is improved by at least 9 times compared to Serial program.

Consider the exact speedup in this particular case A parallel program took 0.022419s to complete its job while the serial program took much higher time compared to it.

2)

Pi value is calculated by using an array is done using openMP and speed 0.021302s to complete its job which is a bit lower than the pi-lock.c program and while serial program as took higher time compared to it as mentioned above.

3)

pi-array.c using the OpenMP collective operation reduction clause to is written and a 0.018731s to complete it job which much less compared to Pi-lock.c and pi-array.c

4)

My Best performing program from Message passing interface is estimating pi using MPI Reduce which took around 0.027852s to complete its job, comparing it to Open MP's best performing program pi-coll.c which took only 0.018731s to estimate pi for similar number of trial.

It can be said that OpenMP is 0.5% faster than the MPI considering this example but OpenMP performs under the cores on each node and MPI has communication between the nodes. An OpeMP and MPI can be compared only when the right information is given and cannot be generalized.

5) Max and Min values are in array are found out by using reduction clause. Negative and positive values of array are initialized by using `mrnd48()` which generates both positive and negative values.