HIGH PERFORMANCE COMPUTING

HOMEWORK 9

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Point 1. Use MPI to parallelize the previous code and approximate π for $n = 1.000.000$. What are the running times for one and two CPUs?

For the serial case the time was 0.124 s, and for each MPI case I got the next solutions:

MPI Parallelize of pimpi.cpp			
Time	Solution	Error	Number of CPUs
0.116287 s	3.14159	1.17582e-09	2
0.109772 s	3.14159	1.17582e-09	1

Point 2. Compare and discuss your results with the OpenMP solution implemented in the midterm. Which implementation works best? Why?

First, the results with OpenMP was:

OpenOMP Parallelize of piparallel.cpp			
Real Time	Solution	Error	Number of Threads
0.174 s	3.14159	1.17582e-09	2
0.152 s	3.14159	1.17582e-09	1

The time with MPI tool was less than the time with Open OMP tool in each case, when the program was run in 2 CPUs/Threads and in 1 CPUs/Threads, then the MPI tool worked better in this case.

I think that the MPI tool is better because every parallel process was working in its own memory space in isolation from the others, and the OpenMP tool depended of the threads work and every thread working in parallel had access to all code part information.