

HPC / Parallel Processing- 2022

Assignment 4 – MPI

Sum of Convergent Series

Riemann zeta function

$$\zeta(s) = \sum_{n=1}^{\infty} \frac{1}{n^s} = \frac{1}{1^s} + \frac{1}{2^s} + \frac{1}{3^s} + \dots$$

Calculate it with $s = 3$ - Apéry's constant -

This problem from $n = 1$ to infinite will be approximately equal to $\zeta(3) = 1.202056903159594$ at the end try to reach to value near this result and print the error as your expected result = 1.202056903159594 (error = expected - calculated)

Write c code to solve this problem using MPI.

Note:

- Process 0 (master) broadcast n to all processes and reduce to get the sum from all other processes
- All processes (including master process) will do their part of calculation
- Don't use any MPI function other than Bcast and Reduce

Bonus:

Calculate the runtime, speedup and efficiency for number of processes (2,4,8,16,64) make other input constant to be able to find the impact of changing number of processes.

Deadline & Submission:

1. The assignment is in groups maximum of 3.
2. Code must be in C and MPI & you must run it before sending.
3. Cheating could lead to serious consequences.

4. Late submission is not allowed.
5. Deadline: Sat. 29/5/2021 11:59 PM
6. Make sure you submit your assignment on blackboard correctly its your responsibility

Grading Criteria :

Your code should be compiled without any errors or you will lose 50% of assignment grade, also the output of the run should be correct or you will lose 25% of the assignment grade.

Item	Points
Logic	2
Divide the work correctly	4
mpi(Bcast, Reduce)	4
Bonus	3

More Info:

https://en.wikipedia.org/wiki/Riemann_zeta_function

https://en.wikipedia.org/wiki/Apery%27s_constant