CSE 415: Introduction to Parallel Computing

Spring 2023, Homework 7 By Robert Warren Francis and Naveen Kumanan

Answer 1 B)

Comparing the performance of my point to point and my collectives’ solutions using the graphs below, both perform almost identically at the N=100000 and N=10M iteration sizes, but there is a slight difference at the N=1000 iterations size. I imagine it’s a negligible difference given how small the runtimes are and the fact that performance is identical at the other two iteration sizes. Speedups and efficiencies are basically the same between the two. Scalability wise I think both my implementations are very scalable. I don’t see anything that suggests that my implementations would not continue to have almost zero runtimes with bigger problems sizes or more processes. At 20 processes runtime becomes almost zero and looks like it reaches a point where the program can not become much faster, therefore increasing processes does not have any effect. I don’t think this is because my implementations are scaling poorly. So, we would need to give my implementations heavier problem sizes to see it scale nicely when you add more processes. Problem size wise I think my implementations will run well with heavier problem sizes.

N=1000 Graphs:

N=100000 Graphs:

N=10000000 Graphs: