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COMP 364

For my final project resubmission, I have moved from the Scheduled Relaxation Jacobi Method to the simpler but still related Successive Over-Relaxation (SOR) method. As with before, this is an extension of Homework 3, but modifying the original Jacobi solution to closer fit SOR.

The SOR method is a variation on the Gauss-Seidel method, which is similar to the Jacobi method, but updates solutions with methods that have already been computed. Furthermore, the “relaxation” in SOR refers to a variable which reduces the required amount of iterations, allowing the method to converge faster.

For tests, I have run strong and weak scaling tests, solving for E(N) for both, and S(N) for strong. However, at the time of testing, Stampede only allowed for 16 cores, which limited the number of tests I was able to compute. Otherwise, I computed the same values and tests as one would with the original HW3 assignment

With these parameters, in terms of weak scaling, the E(N) seems to be highest with 1000^2 points, the middle ground between the different values. With 100^2 points, the E(N) value stays below 1. In terms of strong scaling, the results are similar with both the S(N) and E(N) values. Once again, in both cases, the value rose highest with 1000 points, with 10000 falling just short. With 100 points, the S(N) value still stayed closest to 1. In the case of the parallel efficiency (E(N)) values, however, all of the values were either close to or below 1. Whereas the weak E(N) and strong S(N) values started steady and rose, with the exception of the 100/100^2 point scaling, the strong E(N) values show more of a dip as the number of processes increased.

During the process of these improvements, I already had an idea of what to aim for due to the previous submission. The goal of a simpler SOR function as opposed to the more complex and recent SRJ function made it easier. However, in the future, as previously stated, I may continue to research the SRJ algorithm anyway, in a more independent manner.