Homework 7 – MPI Kmeans

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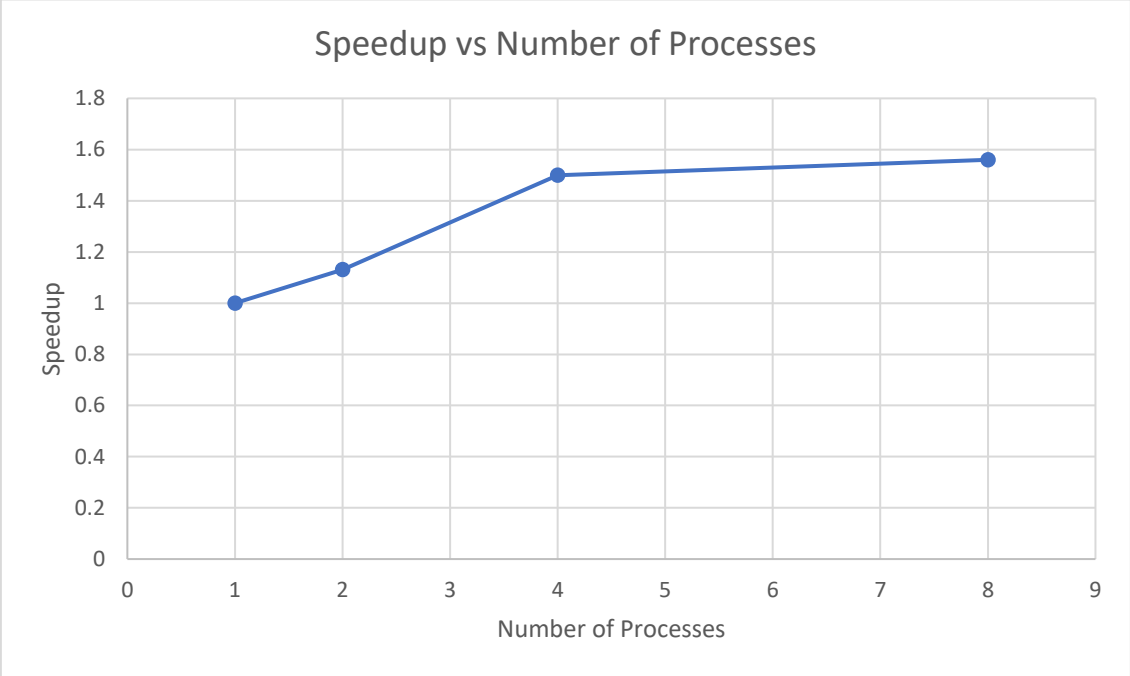
1. Object of the project:
    a. Redo previous K-means assignment using MPI instead of OpenMP.
2. Details:
    a. We now had to implement the kmeans code making use of MPI functions such as MPI_Bcast, MPI_Scatter, and MPI_Gather to parallelize the algorithm.
3. Results:
    a. Number of Processes: [1, 2, 4, 8]
    b. Time Elapsed (s): [0.529, 0.406, 0.353, 0.339]
    c. Speedup: [1, 1.303, 1.499, 1.560]



4. Performance Improvements:
    a. To improve the performance, I can further parallelize the code when doing step 5 where each worker would do its own generator update until finally gathering all the updated pixels to the master where it will write the image. Therefore, I have bad speedup when increasing the number of processes.
5. Bugs Encountered:
    a. Before rewriting the code, I was having a write access violation when attempting to use MPI_Gatherv.