Homework 5 – OpenMP Good Performance

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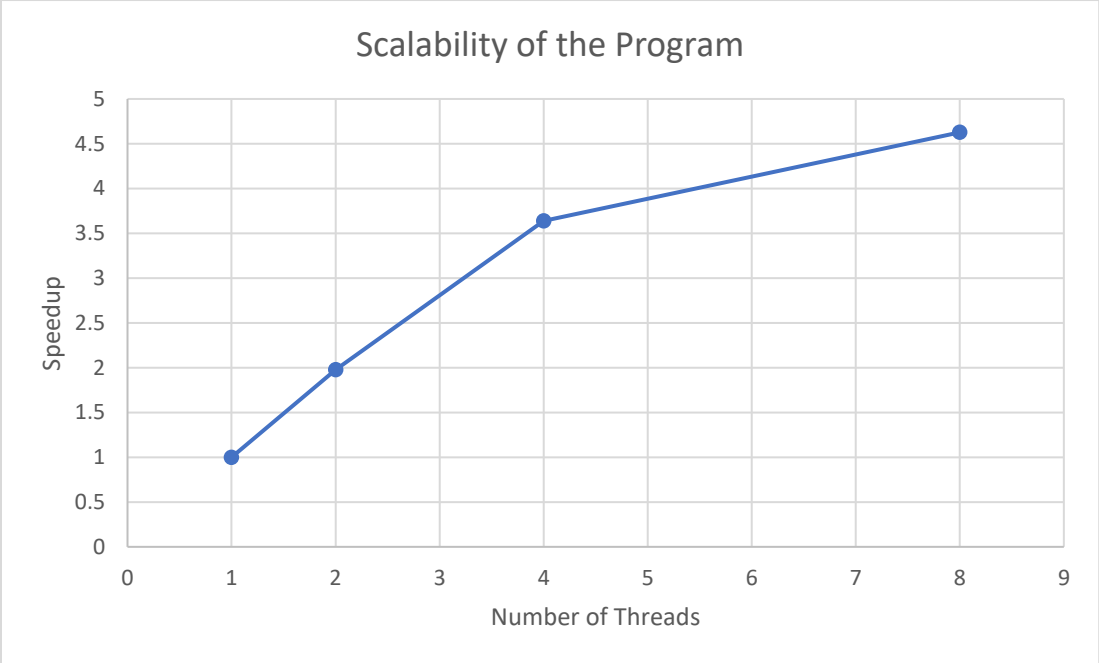
1. Object of the project:
    a. Use techniques discussed in slides to increase performance of the k-means code
2. Details:
    a. Initialization values had to be kept the same so speedup could be compared. To start, cases of false sharing or cache locality issues were addressed as they would be the biggest slowdowns. After that, I ensured I had a coarse grain model for my parallelization. Then, I looked at each for loop in my code to see where I could apply either loop fusion, fission, or collapse. Lastly, dynamic scheduling was applied, and barriers were to be minimized for the fastest speedup possible.
3. Results:
    a. Threads: [1, 2, 4, 8]
    b. Time Elapsed (s): [42.920, 21.691, 11.790, 9.277]
    c. Speedup: [1, 1.979, 3.64, 4.627]



4. Performance Improvements:
    a. To improve performance, I went down the list of possible speedups and started by applying a full coarse grain model to my code. Then, I found a spot where I could apply loop fission. Lastly, I applied dynamic scheduling to my main for loop which led to the greatest speedup.