sameera Oblig 1 report

The CPU is an AMD Ryzen™ 7 4700U-prosessor 2.00 GHz with 8 cores.

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As we can see for k=20, the parallel algorithm does not achieve a speedup over the sequential until n reaches 10 million. The creation and synchronization of threads introduce overhead, for small n this overhead can dominate, leading to a parallel speedup of less than 1. As n increases, the work per thread becomes substantial, and the overhead gets distributed over more significant workloads, resulting in noticeable speedup. It is at n= 10 million that the parallel method begins to show a speedup, which continues to improve, reaching 1.51 at n=100 million.

For k=100, the parallel method shows a similar pattern, with the speedup exceeding 1 starting at n=10 million. This improvement becomes more significant as n increases, achieving a speedup of 1.54 at n=100 million. But if the see at n= 1 million we can see that the sequential and parallel algorithms have a small-time difference, and that is not the case of k=20.

For both k values the Java sort is faster than the parallel algorithm when n is lower than 10 000.

Graph:

The curve for k=100 is consistently above the one for k=20, suggesting that the larger k benefits more from parallelization.

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