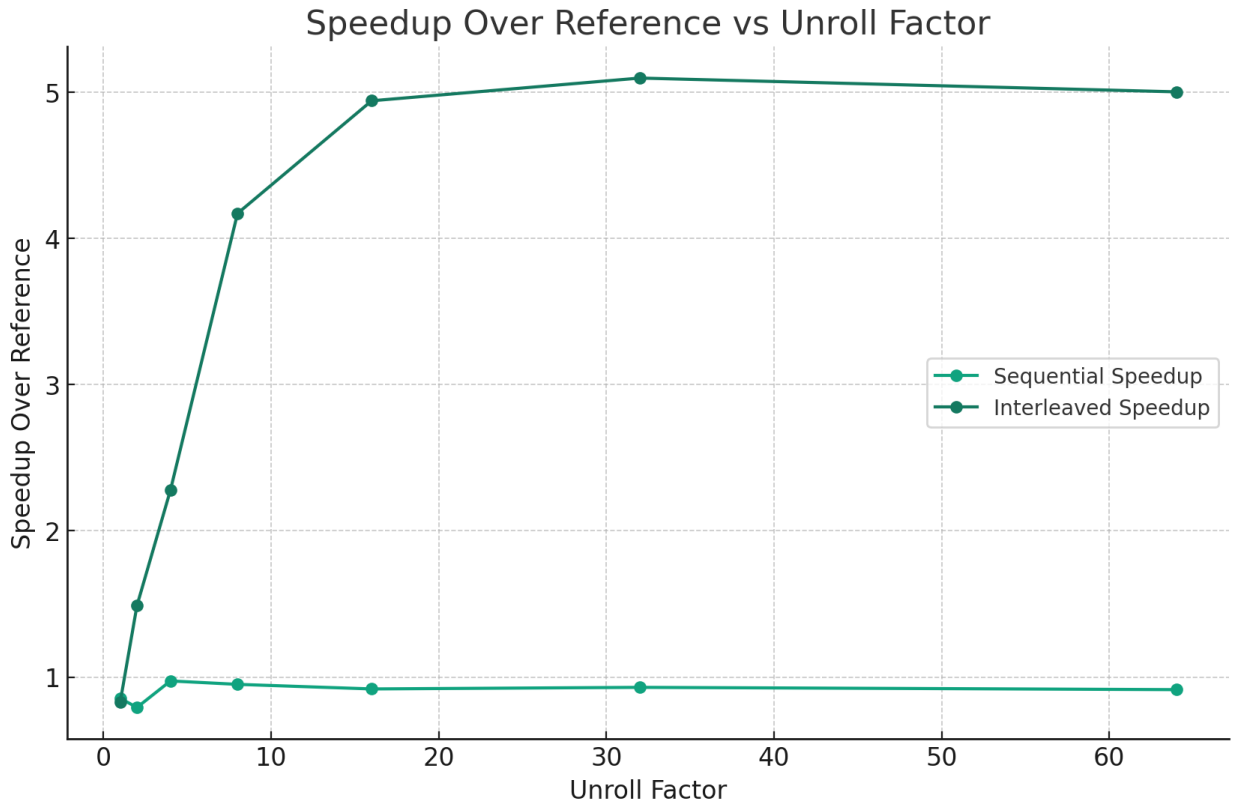
Loops with Independent Iterations

Chain Length = 64

Unroll Factor	Sequential Speedup Over Reference	Interleaved Speedup Over Reference
1	0.855342	0.827655
2	0.791946	1.48812
4	0.973484	2.27922
8	0.950103	4.17152
16	0.918697	4.94203
32	0.929575	5.09749
64	0.913995	5.00322



Observations:

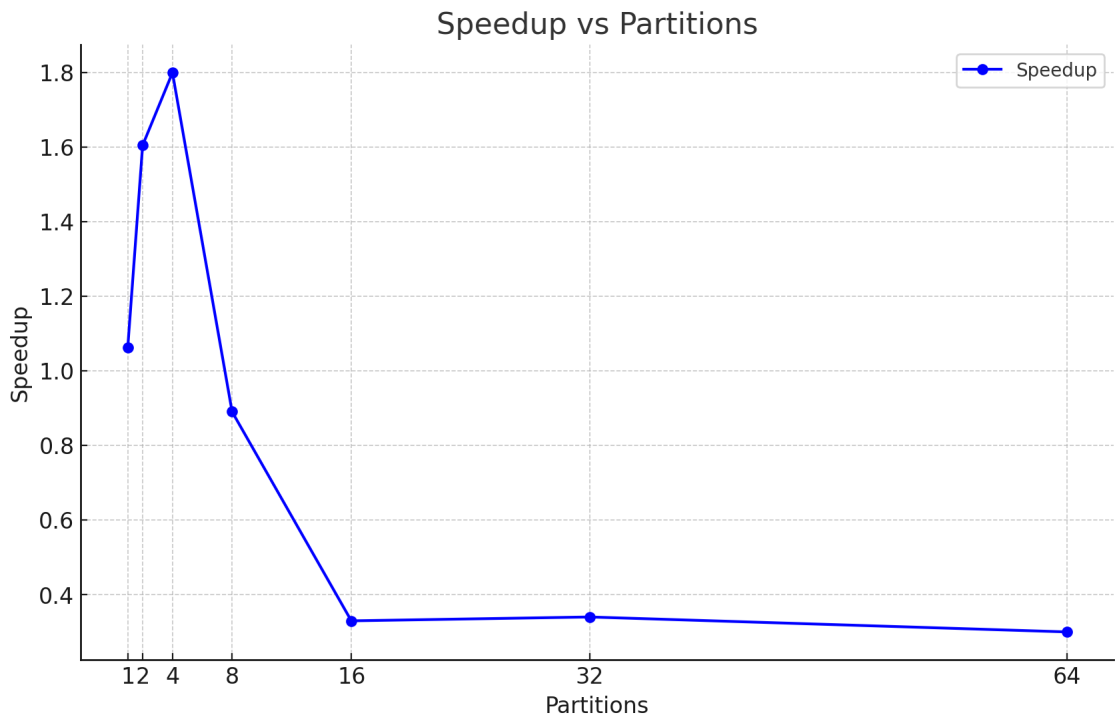
- As the unroll factor increases, the interleaved loop consistently shows an increasing speedup over the reference loop.
- The highest speedup for the interleaved loop over the reference is observed at an unroll factor of 64, with a value of 5.00322.
- The sequential loop's performance relative to the reference fluctuates but generally remains below 1, indicating slower performance compared to the reference loop.

Conclusion:

The data suggests that loop unrolling with interleaving significantly improves performance as the unroll factor increases, particularly in comparison to the reference loop. The sequential loop, while not achieving the same level of speedup, also shows varying degrees of performance enhancement.

Reduction loops

Partitions	New Loop Time (s)	Reference Loop Time (s)	Speedup
1	0.0599185	0.0636093	1.0616
2	0.0317657	0.050964	1.60437
4	0.0298001	0.0536121	1.79906
8	0.0603709	0.0537333	0.890052
16	0.158215	0.0521214	0.329434
32	0.159813	0.0543007	0.339775
64	0.209783	0.0628822	0.299749



Observations:

- The speedup achieved with loop partitioning varies significantly with the number of partitions.
- The highest speedup (1.79906) is observed with 4 partitions.
- As the number of partitions increases beyond 4, the speedup decreases, indicating a decline in performance.
- With 64 partitions, the speedup is the lowest at 0.299749, suggesting that excessive partitioning can lead to performance degradation.

Conclusion:

The data suggests that loop partitioning can improve performance up to a certain point, after which further partitioning becomes counterproductive. The optimal number of partitions in this test was 4, beyond which the speedup decreases, indicating a trade-off between parallelism and overhead in loop partitioning.