Chapter 11 - Exercise 1

Performance Analysis

Raw Data

Serial Binary Search Times (seconds):
- 0.023288
- 0.004525
- 0.005908
- 0.003527
- 0.003789
- 0.004158
- 0.003042
- 0.004139
- 0.003634
- 0.003540
- 0.003716
- 0.004267
- 0.004069
- 0.003807
- 0.003520

Parallel Binary Search Times (seconds):
- 0.031346
- 0.009295
- 0.006320
- 0.002512
- 0.002357
- 0.003464
- 0.002003
- 0.002735
- 0.004760
- 0.004642
- 0.004266
- 0.005376
- 0.005463
- 0.004687
- 0.002813

Statistics

Serial Binary Search:
- **Mean:** 0.00526 seconds
- **Median:** 0.00381 seconds
- **Standard Deviation:** 0.00483 seconds

Parallel Binary Search:
- **Mean:** 0.00614 seconds
- **Median:** 0.00464 seconds
- **Standard Deviation:** 0.00757 seconds

Which is Faster?

- Based on the mean, serial binary search is faster.
- Based on the median, serial binary search is also faster.

Conclusion

For the given dataset and system configuration (MacOS M1 8GB), the serial binary search demonstrates faster performance on average. The parallel implementation incurs overhead that negates potential speedup, particularly for the current array size and process count.