

# 19 Searching, Sorting and Big O

## Objectives

In this chapter you'll:

- Search for a given value in an array using linear search and binary search.
- Sort arrays using the iterative selection and insertion sort algorithms.
- Sort arrays using the recursive merge sort algorithm.
- Determine the efficiency of searching and sorting algorithms.
- Be introduced to Big O notation for comparing the efficiency of algorithms.

## Outline

1. [19.1 Introduction](#)
2. [19.2 Linear Search](#)
3. [19.3 Big O Notation](#)
  1. [19.3.1  \$O\(1\)\$  Algorithms](#)
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  3. [19.3.3  \$O\(n^2\)\$  Algorithms](#)
  4. [19.3.4 Big O of the Linear Search](#)

4. 19.4 Binary Search

1. 19.4.1 Binary Search Implementation
2. 19.4.2 Efficiency of the Binary Search

5. 19.5 Sorting Algorithms

6. 19.6 Selection Sort

1. 19.6.1 Selection Sort Implementation
2. 19.6.2 Efficiency of the Selection Sort

7. 19.7 Insertion Sort

1. 19.7.1 Insertion Sort Implementation
2. 19.7.2 Efficiency of the Insertion Sort

8. 19.8 Merge Sort

1. 19.8.1 Merge Sort Implementation
2. 19.8.2 Efficiency of the Merge Sort

9. 19.9 Big O Summary for This Chapter's Searching and Sorting Algorithms

10. 19.10 Massive Parallelism and Parallel Algorithms

11. 19.11 Wrap-Up

1. Summary
2. Self-Review Exercises
3. Answers to Self-Review Exercises
4. Exercises
5. Making a Difference