Session 21
Strategy 3: Divide-and-Conquer

Lecture Summary

This lecture is an opportunity to revise the mechanics of recursion.

Introduction to Divide-and-Conquer: Mergesort

1. What is a divide and conquer solution?
2. Mergesort design, operation, and performance
3. General divide-and-conquer recurrence & Master Theorem

Session Exercise

P15. Code the textbook's mergesort algorithm.

Detailed instructions

- Insert the following trace statements (cut-paste):
  - At beginning of mergesort: `document.write( "<h2>mergesort</h2><p>", a, "</p>" );`
  - At end of merge: `document.write( "<h3>merge</h3><p>", a, "</p>" );`
- Compare execution trace of your code with the diagram from the textbook example
- Insert code to count calls to mergesort and merge procedures
- Run your code for at least 10 cases and compare empirical with mathematical counts

📖 **Exercise 5.1** • 2, 5, 7 🛠 9

Reading List

- 📖 5.1
- 📖 Appendix B (Divide-and-Conquer)

Keywords

Backtracking, divide-and-conquer, recursion