coursera

Overview

This week we finish our study of graph algorithms by considering the classic maxflow and mincut problems, two problem-solving models that are useful in a broad variety of applications. Then we pivot to begin our study of string-processing algorithms, starting with substantially improved algorithms for sorting in the case when keys are strings.

Lecture 5: Maximum Flow and Minimum Cut. In this lecture we introduce the maximum flow and minimum cut problems. We begin with the Ford–Fulkerson algorithm. To analyze its correctness, we establish the maxflow–mincut theorem. Next, we consider an efficient implementation of the Ford–Fulkerson algorithm, using the shortest augmenting path rule. Finally, we consider applications, including bipartite matching and baseball elimination.

Lecture 6: Radix Sorts. In this lecture we consider specialized sorting algorithms for strings and related objects. We begin with a subroutine to sort integers in a small range. We then consider two classic radix sorting algorithms—LSD and MSD radix sorts. Next, we consider an especially efficient variant, which is a hybrid of MSD radix sort and quicksort known as 3-way radix quicksort. We conclude with suffix sorting and related applications.

To Do:

- **Programming Assignment:Baseball Elimination.** Given the standings in a sports division at some point during the season, determine which teams have been mathematically eliminated from winning their division.

- **Job Interview Questions.** Algorithmic interview questions based on the lecture material.

- **Suggested Readings.** Section 6.4 (pp. 886–902) and 5.1 in *Algorithms, 4th edition*.

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Mark as completed