Interview Preparation

Lecture: 12 – Dynamic Programming & Greedy

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Doubts from last class?

Lets discuss few problems

1. A child is running up a staircase with n steps and can hop either 1 step, 2 steps or 3 steps at a time. Implement a method to count how many possible ways the child can run up to the stairs.

2. Longest Common Subsequence

3. Edit Distance

4. Matrix Multiplication

Lets discuss few problems

5. Subarray with maximum sum
6. Number of Palindrome Substrings in a String
7. Palindrome Pairs in a String

Greedy Algorithms

Greedy Algorithms

1. We take locally optimal decision hoping that it will work overall as well
2. Hard to figure out if it will work or not

Lets discuss few problems

1. Activity Selection Problem
2. Fractional Knapsack

Find Centroid of a Binary Tree

Brain Teasers and Probability

Brain Teasers and Probability

1. I roll two dice. What is the probability that the 2nd number is greater than the 1st?
2. Having an infinite stream of numbers write a function to take an element with equal probability for each.
3. There are 16 coins on a table. There are two players A&B. Each player can take 1 or 2 coins at a time. The person who takes the last coin is the loser. Assuming both A & B are really smart who will win this game?
4. Given Random7(generates random number between 1 to 7) write code for Random5
5. Given Random5(generates random number between 1 to 5) write code for Random7

5. An evil king has 1000 bottles of wine, one of which has poison. The king decides he will get some of his prisoners in his vast dungeons to drink the wine. Poison shows its effects in 5 weeks. Rather than using 1000 prisoners each assigned to a particular bottle, this king knows that he needs to murder no more than 10 prisoners to figure out what bottle is poisoned, and will still be able to drink the rest of the wine in 5 weeks time. How does he pull this off?

5 Cards Puzzle

Thank you

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