Analysis of Algorithms

[5CS4-05/5IT4-05]

Unit 3· Backtracking

Sum of Subset Problem

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Sum of Subset Problem

Sum of Subset Problem (or Subset sum problem) is to find subset of elements that are selected from a given set whose sum adds up to a given number K.

It is assumed that the input set is unique (no duplicates are presented) and contains non-negative values.

Sum of Subset Problem Solution

Exhaustive Search Algorithm for Subset Sum

One way to find subsets that sum to K is to consider all possible subsets. A power set contains all those subsets generated from a given set. The size of such a power set is 2^N.

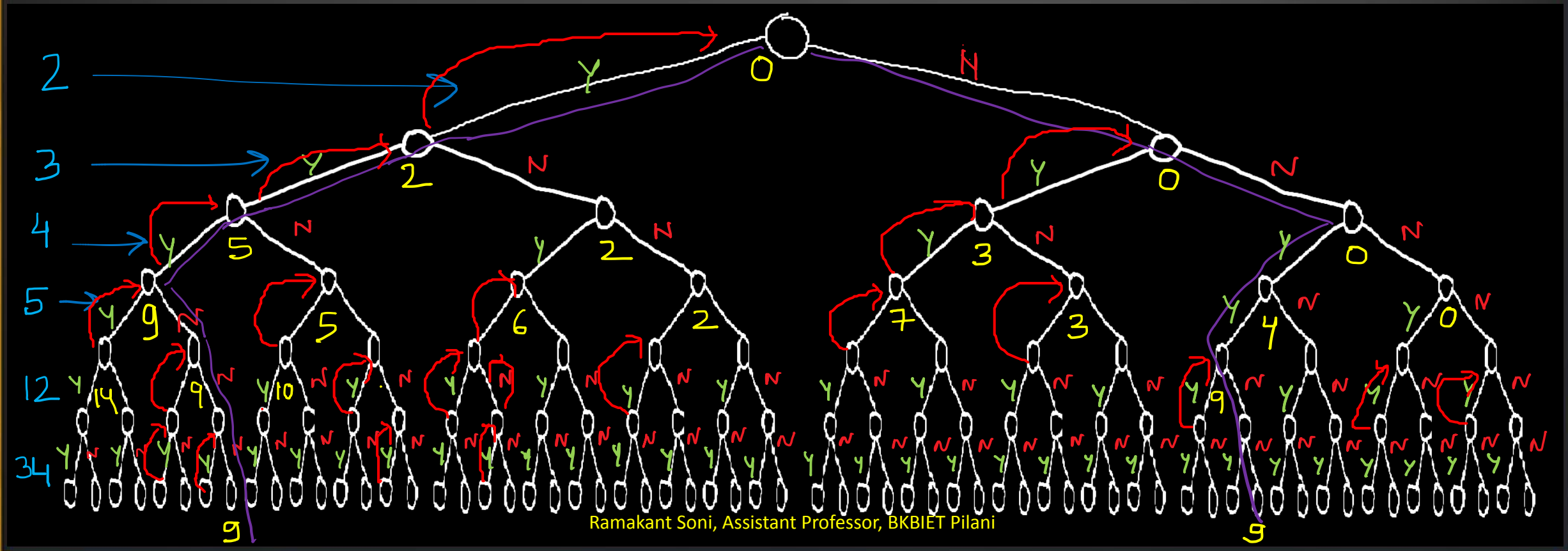
Backtracking Algorithm for Subset Sum

Using exhaustive search we consider all subsets irrespective of whether they satisfy given constraints or not. Backtracking can be used to make a systematic consideration of the elements to be selected

Sum of Subset Problem Example

Input: set[] = {3, 34, 4, 12, 5, 2}, sum = 9
After sorting {2, 3, 4, 5, 12, 34}
Solution= {2,3,4}, {4,5}

$2^6 = 64$ possible subsets



Queries ?