UWI

Design and Analysis of Algorithms

Tutorial 9

Backtracking Technique

1. Explain the theory behind the backtracking technique.
2. Solve the subset sum problem using the backtracking approach for the given set A = {1, 2 ,5, 6, 8}, with d as **9**.
3. Attempt to solve the 3-Queens problem using the backtracking technique. Is there a solution?

Branch-and-Bound Technique

1. Explain the theory behind the branch and bound technique.
2. Solve the 0/1 knapsack problem using the branch-and-bound technique for the instance shown in table 1 with a knapsack capacity of **10**.

Item	Weight	Value
1	4	$40
2	7	$42
3	5	$25
4	3	$12

Table 1: A small instance of the 0/1 knapsack problem