
BLOCK INTRODUCTION

In the previous block we discussed the ways to find algorithm complexity and some basic algorithms.

The block introduces three fundamental techniques to solve problems efficiently: Greedy Technique, Divide & Conquer and Graph Algorithms. Greedy Techniques are typically used to solve optimization problems. An optimization problem is one the which , we are give a set of input values, which are required to be either maximized or minimized with respect to some constraints or conditions. A divide and conquer techniques works by recursively breaking down a problem into two or more sub problems of the type, until these become simple enough (i.e. small in size with respect to the original problem to solved directly). The solution to the sub-problems are then combined to give a solution to the original problem. The vast majority of computer algorithm operate on data organizing these data in certain way has a significant role in design and analysis of algorithm. Graph is one such fundamental data structures.

Brief structure of each unit in this block is as below.

Unit-1 express several greedy techniques to solve optimization problems. In starts with some examples to understand greedy techniques and makes formalization of greedy techniques. Further it applies how greedy method is applied to solve any optimization problem such as Knapsack problem, minimum-spanning tree problem and shortest path problem.

Unit-2, discusses about divide and conquer approach for solving the problem which has large data set. General issues in divide and conquer approach are also explained. Binary search, Merge sort, quick sort and integer multiplication problems and their complexity analysis are discussed.

Unit-3, gives an introduction to graph and methods for representing a graph i.e Adjacency matrix and adjacency list. For searching in graph, two algorithms i.e Depth first search and Breadth first search and their analysis is discussed. These algorithms are supported with the help of suitable examples.