



Faculty of Technology and Engineering

U & P U. Patel Department of Computer Engineering

Date: 21/ 06/2022

Practical List

Academic Year	:	2022-23	Semester	:	5 th
Course code	:	CE355	Course name	:	Design and analysis of algorithms

Sr. No.	Aim		Hours	CO
1.	Implement and analyze algorithms given below.		02	1,2
	1.1	Factorial (Iterative and Recursive)		
	1.2	Fibonacci Series (Iterative and Recursive)		
	1.3	Linear Search and Binary Search		
2.	Implement and analyze algorithms given below.		02	1,2
	2.1	Bubble Sort		
	2.2	Selection Sort		
	2.3	Insertion Sort		
3.	Divide and Conquer		02	1,2
	3.1	Quick Sort		
	3.2	Merge Sort		
4.	Greedy Approach		08	3,5
	4.1	A Burglar has just broken into the Fort! He sees himself in a room with n piles of gold dust. Because each pile has a different purity, each pile also has a different value (v[i]) and a different weight (w[i]). A Burglar has a bag that can only hold W kilograms. Calculate which piles Burglar should completely put into his bag and which he should put only fraction into his bag. Design and implement an algorithm to get maximum piles of gold using given bag with W capacity, Burglar is also allowed to take fractional of pile.		
	4.2	Suppose you want to schedule N activities in a Seminar Hall. Start time and Finish time of activities are given by pair of (s _i , f _i) for i th activity. Implement the program to maximize the utilization of Seminar Hall. (Maximum activities should be selected.)		
	4.3	Find Minimum Cost spanning tree of a given undirected graph using Kruskal and Prim's algorithm. Also observe effect on experiment result of choosing those algorithms.		
	4.4	Implementation of any challenge on Hackerank.		
5.	Dynamic Programming Approach		08	3,5
	5.1	Let S be a collection of objects with profit-weight values. Implement the 0-1 knapsack problem for S assuming we have a sack that can hold objects with total weight W.		

	5.2	Implement a program to print the longest common subsequence for the two strings.		
	5.3	Given a chain $\langle A_1, A_2, \dots, A_n \rangle$ of n matrices, where for $i=1, 2, \dots, n$ matrix A_i with dimensions. Implement the program to fully parenthesize the product A_1, A_2, \dots, A_n in a way that minimizes the number of scalar multiplications. Also calculate the number of scalar multiplications for all possible combinations of matrices		
	5.4	Implementation of any challenge on Hackerank.		
6.	Backtracking		02	4,5
	6.1	You are given an integer N . For a given $N \times N$ chessboard. Implement a program to find a way to place ' N ' queens such that no queen can attack any other queen on the chessboard. A queen can be attacked when it lies in the same row, column, or the same diagonal as any of the other queens. You have to print one such configuration.		
7.	String Matching		02	3,5
	7.1	Two strings, a pattern ' P ' and a text ' T ' are given. The task is to implement program to determine if the pattern occurs in the text using Rabin Karp algorithm, and if it does, print all of its occurrences; else, print -1.		
	Codechef Problems Discussion		04	5