Nirma University

Institute of Technology

Computer Science and Engineering department

B.Tech. Computer Science and Engineering

Semester: III, **Academic Year:** 2020-21, **Term:** ODD

2CS301 Data Structures and Algorithms

List of Experiments

Practical No.	Topic	Hour (s)	Mapped CLO's
1.	a) An organization has to maintain it employee's details. There is need of accessing details of employees frequently. Taking this information into consideration, use appropriate data structure to implement system for providing functionality of adding details of new employee, removing employee's detail from the system, listing all employees' details. b) Design anagram game using array. Allow a user to enter N primary words and store it in an array. Generate a random number from the range 1 to N. Based on the random number generated display the string stored at that index of array and allow user to enter its anagram. Compare whether an anagram entered is correct or not and display appropriate message. [Given a word A and word B. B is said to be an anagram of A if and only If the characters present is B is same as characters present in A, irrespective of sequence. For ex: "EARTH" == "HEART"]	**04**	**CLO1, CLO3**
2.	a) Write a program to reverse a given string using Stack. b) Write a program to convert fully parenthesized infix expression to postfix expression.	**04**	**CLO1, CLO3**
3.	a) Write a program to simulate printer spooler application. Assume maximum 5 users are using this printer. Use appropriate data structure to implement the system.	**04**	**CLO1, CLO3**

	b) Write a program to implement priority queue using an array.		
4.	a) Consider a linked list with N integers. Each node of the list is numbered from '1' to 'N'. Write a program to split the list into 4 lists, so that: i) First list contains nodes numbered 1, 5, 9, 13, _, _, _ ii) Second list contains nodes numbered 2, 6, 10, 14, _, _, _ iii) Third list contains nodes numbered 3, 7, 11, 15, _, _, _ iv) And fourth list contains nodes numbered 4, 8, 12, 16, _, _, _ b) Write a program to reverse a given singly linked list.*	**02**	**CLO1**
5.	a) Write a program to simulate music playlist application using appropriate data structure. There is no estimation about number of music files to be managed by this application. It is expected that user may add new music files or may remove music files frequently. Your Program should support following functionalities: (a) play next file (b) play previous file, (c) play first file and (d) play next file and (e) play specific file. b) Write a program to perform addition of two polynomial equations using linked list.	**04**	**CLO1, CLO3**
6.	a) Write a program to implement Quick sort for sorting a given set of integers in ascending order. b) Write a program to implement Heap sort algorithm for sorting a given set of integers in ascending order. c) Write a program to implement merge sort for sorting a given set of integers in ascending order. *	**04**	**CLO2**
7.	Write a program to implement Binary search operation on a given set of integers.	**02**	**CLO2**
8.	Write a program to construct binary tree from a given preorder and postorder traversal sequence.	**02**	**CLO3**
9.	Write a program to implement phone book dictionary using Binary Search Tree which provides following operations: (a) add new entry in phone book, (b) remove entry from phone book, (c) search phone number (d) list all entries in ascending order of name and (e) list all entries in descending order of name.	**04**	**CLO3**

10.	Write a program to obtain a spanning tree of a connected undirected graph using appropriate data structure.	**02**	**CLO1, CLO3**
	Total:	**32**	