Group Assignment

AY –ODD SEM 2021-22

Subject: Data Structures and Applications(3RIS02)

Faculty: Mrs. Sharmila S P

Dear students,

All of you find the assignment topics assigned to you. Complete the implementation within this week.

Phase-1 evaluation on 14.02.2022 (Monday). Everyone have to demonstrate the progress and incorporate the modifications.

Final presentation dates will be announced immediately after that.

You need to prepare a report of your work in the format that I will send you and upload it to the google form after final presentation.

Sl. No	Team Members	USN	Assignment topic
1.	Ashutosh Kamal Atharva Shukla vaibhav singh Varun singh	1SI20IS006 1SI20IS007 1SI20IS062 1SI20IS063	Demonstrate implementation of Priority Queue using Linked Lists(SLL and DLL)
2.	MD AKHTAR ALI SHREYANSHU SHUBHAM AYUSHMAN SINHA KUMAR AASHISH RAJ	1SI20IS028 1SI20IS048 1SI20IS008 1SI20IS023	Presentation on Josephus problem and its implementation.
3.	MAHIKA K SN MANASA ASHA D S KUNSHI N S	1SI20IS025 1SI20IS032 1SI20IS005 1SI20IS024	Implement a program to read n pairs of coefficients and exponents, (c_i,e_i) 1<= i<=n of a univariate polynomial, X, and to convert the polynomial into the circular linked list Assume $e_1 > e_{i+1}$, 1<= i < n, and that c_i !=0, 1<= i<=n. Your algorithm should leave X pointing to the head node. a.Display the polynomial along with the header node value. b.Find the term with higher order c.Sort the polynomial based on the exponents.
4.	VENKATESH PRASAD SHASHANK DAWOOD SHABIR	1SI20IS064	Let A and B be pointers to the head nodes of two univariate polynomials represented as SLL. Implement a program to compute the product polynomial C = A * B. Your program should leave A and B unaltered and create C as a new list. Display results with terms in sorted order.
5.	Khushi Deeksha M Belli L Sushma K P	1SI20IS021 1SI20IS012 1SI20IS009 1SI20IS060	Implement a program to make an in-place replacement of a substring of X by the string Y. Assume that strings are represented using fixed size nodes of a SLL and that each node in addition to a link field has space for 4 characters. Display the text string and the substring alongwith the position of the occurrence. Your program should find multiple occurrence of a substring.
6.	Surabhi Bhanushree MS Koushika M Sneha T	1SI20IS059 1SI20IS010 1SI20IS022 1SI20IS053	If X = $(x_1, ...,x_m)$ and Y = $(y_1, ...,y_n)$ are strings represented as SLL where x_i and y_i are letters of the alphabet, then X is less than Y if $x_i = y_i$ for 1<= i <= j and $x_j < y_j$ or if $x_i = y_i$ for 1<= i <= m and m < n. Implement a program (without using built-in functions) which takes two strings X, Y and returns either -1, 0, +1 if X < Y, X = Y or X > Y respectively.

			Implement a function which finds the first character of X which does not occur in the string Y.
7.	ANUSHA J SINGH K S BRUNDA NANDITHA B U NIRMALA S S	1SI20IS004 1SI20IS019 1SI20IS034 1SI20IS035	Implement a program that takes coordinates of n vertices of a polygon in clockwise and determine the polygon is a regular or not. Your program should not use arrays. Display the dimensions, number of sides of the polygon alongwith whether it is regular or not regular. Read input from a file.
8.	DARSHAN Y R SIREESH GOWDA H K DHEERAJ ROHAN KO	1SI20IS011 1SI20IS052 1SI20IS018 1SI20IS043	Implement a program to read quiz and test marks of 60 students in the DSA subject read from a file, rescale quiz marks to 3 and Test marks to 17. There are 4 such quizzes and 2 tests and an assignment for 4marks. Marks of every students should be computed for 50 along with the eligibility, store the old and new marks in the file.
9.	NANDEESH M MOHAMMED ADNAN PRAJWAL K M SAI SONAL G	1SI20IS033 1SI20IS031 1SI20IS038 1SI20IS045	The name of a person consists of Firstname, Middlename, Lastname. Implement a program to read components of a name which is stored in SLL. If the key name is present in the list then you should print the short form of the name. Read names from a file, and write results to a file.
10.	GHANASHREE S RHUTHIKA HM SINCHANA M SUCHITRA DINESH SHEREGAR	1SI20IS013 1SI20IS041 1SI20IS051 1SI20IS057	Implement a SLL of names. After read process your program should sort the names in ascending and descending order. After every insertion the order of names in the list must be updated. You program should take the input of names from a file and write the output to another file. Find a palindrome name from the list. Find the number of names in the list. Find duplicate names in the list.
11.	RAJATH R PRADEEP L ASHTKAR NISHANTH KUMAR K S SHARATH K M	1SI20IS040 1SI20IS037 1SI20IS036 1SI20IS046	Anagram is a word formed by rearranging letters of a different word. Implement a program that reads strings stored in a list. Anagrams of the first string only must be inserted to the list after a verification process.
12.	ritwik raj alok kumar harsh tayal ishan verma	1SI20IS042 1SI20IS001 1SI20IS014 1SI20IS015	Implement a program to Construct a tree representing hierarchy of a family. Choice of the user can be a male dominant or female dominant. Read the names, construct the tree and display results in Level order only.
13.	AMIYANSHU ANUDEEP KS SOURAV SETHI SUMIT	1SI20IS002 1SI20IS003 1SI20IS054 1SI20IS058	Define a structure representing a book and having the following fields: Name, list of authors, publisher, year of publication and ISBN number. Write functions to do the following tasks on an array of books: a. Find all books published in a given year. b. Find all books published between two given years. c. Find all books from a given publisher. d. Find all books from a given author. e. Sort the books by their ISBN numbers. f. Sort the books by their names. g. Sort the books by their first authors.
14.	JEEVAN G MOHAMMAD SHAHNAWAZ PUSHKAR PANDEY SHREYASH PRATAP SINGH	1SI20IS016 1SI20IS030 1SI20IS039 1SI20IS050	1. Consider the following set of real numbers: A = { a + b sqrt(2) | a,b are integers }. a. Define a structure to represent an element of A. b. Write a function that, upon input of two elements of A, returns the sum of the input elements. c. Repeat the last part for subtraction and multiplication of elements of A. It is known that the element a + b sqrt(2) has an inverse in the set A if and only if (a square minus 2 b square)a2 - 2b2 = 1 or -1. Write a function that, given an invertible element of A, returns the inverse of the element. If the input to the

			function is not invertible, the function should return 0 after prompting an error message
15.	Karthik mithilesh Jeevan v s shreyas Reddy N	1SI20IS020 1SI20IS029 1SI20IS017 1SI20IS049	Implement the following functions on a Binary tree. a. Find height of a tree b. Find depth of a tree c. Find the number of leaf nodes in a tree d. Find the number of internal nodes in a tree e. Extract the elements in a particular level of a tree f. Find the longest path in a tree along with the nodes in that path
16.	MAYURESH S V NANDEESH SUBRAMANYA JOSHI SWASTIK	1SI20IS027 1SI20IS044 1SI20IS056 1SI20IS061	Implement a program to perform the following a. Construct a complete binary tree from the level order input given from an array b. Pass the tree as argument to a function to count the number of nodes in the tree. c. Mirror the tree and verify it is a symmetric tree or not. d. Display all traversals before mirroring and after mirroring