**DSA ASSIGNMENT**
**DEADLINE: 16/11/24**

- Given an array of positive and negative numbers, arrange them such that all negative integers appear before all the positive integers in the array. The order of appearance should be maintained.

*Examples:*
*Input: [12 11 -13 -5 6 -7 5 -3 -6]*
*Output: [-13 -5 -7 -3 -6 12 11 6 5]*

- Given a singly linked list, write a function to swap elements pair-wise. For example, if the linked list is 1->2->3->4->5 then the function should change it to 2->1->4->3->5, and if the linked list is 1->2->3->4->5->6 then the function should change it to 2->1->4->3->6->5

- Given two linked lists, insert nodes of second list into first list at alternate positions of first list.For example, if first list is 5->7->17->13->11 and second is 12->10->2->4->6, the first list should become 5-> 12-> 7-> 10-> 17-> 2-> 13-> 4-> 11-> 6 and second list should become empty. The nodes of second list should only be inserted when there are positions available. For example, if the first list is 1->2->3 and second list is 4->5->6->7->8, then first list should become 1->4->2->5->3->6 and second list to 7->8.

- Write a function to check loop exist in the linked list or not, if yes then break it.

- Let two numbers are represented using the single linked list. Write a function to add these numbers and display the resultant linked list.

- Write a function that will take two polynomials with two variables X and Y (e.g. $4x^2y^3$-3xy+x-5y+7) and will return the added polynomial represented by the linked list.

- Write the functions for evaluation of postfix expression containing Multi-Digit Integer.

- In a tabular form give a comparative study of all type of sorting algorithms/process. Comparison in terms of time complexity(all cases), space complexity, applicability area etc.

- Write a menu driven program to check the following
  A binary tree is a binary search tree or not
  A binary tree is balanced or not

- Write an algorithm that takes root node of binary tree and swap the left and right children of every node [Mirror Image]

**NOTE:** Write the solution in A4 sheet. Use both side of the paper. The front page should only mention the roll number, name, section etc. For late submission, the mark deduction is 1 per day.