1. **Implement Johnson Trotter algorithm to generate permutations.**

#include <stdio.h>

#include <stdlib.h>

void swap(int\* a, int\* b) {

    int temp = \*a;

    \*a = \*b;

    \*b = temp;

}

void generatePermutations(int arr[], int start, int end) {

    if (start == end) {

        for (int i = 0; i <= end; i++) {

            printf("%d ", arr[i]);

        }

        printf("\n");

    } else {

        for (int i = start; i <= end; i++) {

            swap(&arr[start], &arr[i]);

            generatePermutations(arr, start + 1, end);

            swap(&arr[start], &arr[i]); // backtrack

        }

    }

}

int main() {

    int n;

    printf("Enter the number of elements: ");

    scanf("%d", &n);

    int\* arr = (int\*)malloc(n \* sizeof(int));

    printf("Enter the elements: ");

    for (int i = 0; i < n; i++) {

        scanf("%d", &arr[i]);

    }

    generatePermutations(arr, 0, n - 1);

    free(arr);

    return 0;

}

Output:

