Practice Lab Assignment 8

For this Practice Lab Assignment, you will write programs in C, **making use of the concepts that have been taught in the class.**

Instructions

- There are 7 questions in this assignment.
- Any discussion with neighbor/or any other student is strictly not allowed.
- Mobile phones are not allowed. If found, disciplinary action may be taken.

Due Date: **This is only a Practice Lab so no submission is required.**

Grading Criteria

No Grading Criteria.

Programming Questions

1. Write a program for Bubble Sort using 2 functions, bubble_sort() and swap() such that bubble_sort() function must be called inside main() function and swap() function must be called inside bubble_sort() function.

2. Given an unsorted array. The task is to calculate the cumulative frequency of each element of the array using count array.

Examples:

Input: arr[ ] = {1, 2, 2, 1, 3, 4}
Output: 1 -> 2
2 -> 4
3 -> 5
4 -> 6
Input: arr[ ] = {1, 1, 1, 2, 2, 2}
Output: 1 -> 3
2 -> 6

3. Assume that there is an array Marks[ ], such that the index of the array specifies the roll number of the student and the value of a particular element denotes the marks obtained by the student. For example, if it is given Marks[4] = 78, then the student whose roll number is 4 has obtained 78 marks in the examination.
Now, write a program to:

(a) Find and print the total number of students who have secured 80 or more marks.

(b) Find and print the roll number and marks of all the students who have got distinction.

Size of the array must be taken during run time.

4. Write a function rotate(ar[], d, n) that rotates arr[] of size 'n' by d elements.

For Example:- If input array is { 1, 2, 3, 4, 5, 6, 7} and d = 2, then
Output should be { 3, 4, 5, 6, 7, 1, 2}

You may use below given "main" function as it is in your program to save your time and check the validity of "rotate" function.

```
#include<stdio.h>
void main()
{
        int size, i, d;
        printf("Enter size of the array\n");
        scanf("%d", &size);
        int arr[size];
        printf("Enter array elements\n");
        for(i=0; i<size; i++)
                scanf("%d", &arr[i]);
        printf("Enter rotation value of 'd'\n");
        scanf("%d", &d);
        rotate(arr, d, size);
}
```

5. Given an array of elements of length N, ranging from 0 to N-1. Rearrange the array such that A[i] = i and if i is not present, display "-1" at that place.

Examples:
Input: arr = {-1, -1, 6, 1, 9, 3, 2, -1, 4, -1}
Output: [-1, 1, 2, 3, 4, -1, 6, -1, -1, 9]

Input: arr = {19, 7, 0, 3, 18, 15, 12, 6, 1, 8, 11, 10, 9, 5, 13, 16, 2, 14, 17, 4}
Output: [0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19]

6. Write a program to check whether 2 strings are anagram to each other or not. Two strings are anagrams if they are written using the same exact letters, ignoring space, punctuation and capitalization. Each letter should have the same count in both strings.
For example, Army and Mary are anagram of each other.

7. Write a program that extracts part of the given string from the specified position. For example, if the string is "Working with strings is fun", then if from position 4, 4 characters are to be extracted then the program should return string as "king".

Moreover, if the position from where the string is to be extracted is given and the number of characters to be extracted is 0 then the program should extract entire string from the specified position.