National Institute of Technology Calicut
Department of Computer Science and Engineering

B. Tech. (CSE) – Third Semester
CS2092D: Programming Laboratory
Extra_Question(Assign_-3_Part-A)

General Instructions

- Programs should be written in C language and compiled using C compiler in Linux platform.
- Invalid input should be detected and suitable error messages should be generated.
- Sample inputs are just indicative.

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1. Write a program to merge two sorted integer arrays A and B of size ‘m’ and ‘n’ respectively. The program should read the input from the file ***test.txt*** and prints the output in the file ***out.txt***. The input file contains an integer ‘m’, an integer ‘n’, a list of m integers and a list of n integers. The elements of A and B are integers which are arranged in ascending order. The program should not use sorting algorithm.

   Input file format:
   The first line contains a positive integer m indicating the length of input array A.
   The next line contains a positive integer n indicating the length of input array B.
   The next line contains m space separated integers (arranged in ascending order).
   The next line contains n space separated integers (arranged in ascending order).

   Output file Format :
   The merged array which contains all the elements of A and B in ascending order.

   Input

   5
   10
   30 69 10 25 15
   34 89 12 54 33 92 78 84 5 40

   Output

   5 10 12 15 25 30 33 34 40 54 69 78 84 89 92

2. Write a program to perform merge sort (ascending order) on a linked list of integers, avoiding duplicates. Linked list elements are stored in the file **list1.txt**. Sorted list should be stored in the file **list2.txt**.

   Input

   list1.txt 90 1 11 2 56 11 12 90 11

   Output

   list2.txt 1 2 11 12 56 90

3. Write a program to perform selection sort (non-decreasing order) on a linked list of integers. Linked list elements are stored in the file **list1.txt**. Sorted list should be stored in the file

list2.txt. Each iteration of sorting has to be printed in console.

Input

list1.txt 5 9 7 2 4 3 6

Output

list2.txt 2 3 4 5 6 7 9

First iteration : 2 9 7 5 4 3 6
Second iteration : 2 3 7 5 4 9 6
Third iteration : 2 3 4 5 7 9 6
Fourth iteration : 2 3 4 5 7 9 6
Fifth iteration : 2 3 4 5 6 9 7
Sixth iteration : 2 3 4 5 6 7 9

4. Write a program to implement linear search on a set of integers stored in an input file **inp.txt.** The program should handle duplicate elements by storing the count and position of each occurrence of the element to be searched. The element to be searched is provided by user from the console.

Input

inp.txt 23 12 45 23 67 86 23 12
Enter the element to be searched: 23

Output

Element 23 has 3 occurrences and is present in the positions 1,4,7

5. Write a program that receives an integer n and an array of n integer values from the file **input.txt** and checks if the values are sorted either in ascending/ descending order. The program should include the following functions:

- ***Sorted_asc()***: The function will return **1** if the array values are sorted in ascending order, **0** otherwise.
- ***Sorted_desc()***: The function will return **1** if the array values are sorted in descending order, **0** otherwise.
- ***Bubble_sort()***: If both of the above functions return 0, sort the input array in ascending order using Bubble sort.

Input – 1

input.txt 6
1 4 6 7 32 45

Output – 1

The array is sorted in ascending order.

Input – 2

input.txt 7
14 34 2 76 45 32 4 3

Output – 2

The array is not sorted.
The sorted array in ascending order is: 2 3 4 14 32 34 45 76

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