National Institute of Technology Calicut
Department of Computer Science and Engineering
B. Tech. (CSE) – Third Semester
CS2092D: Programming Laboratory
Assignment –1

Submission deadline (on or before):
10th September 2020, 01:00:00 PM

Policies for Submission and Evaluation
You must submit your assignment in the moodle (Eduserver) course page, on or before the submission deadline. Also, ensure that your programs in the assignment compile and execute without errors in any server/platform. During evaluation, failure to execute programs, in the assignment without compilation errors may lead to zero marks for that program.
Your submission will also be tested for **plagiarism**, by automated tools. In case your code fails to pass the test, you will be straightaway awarded zero marks for this assignment and considered by the examiner for awarding F grade in the course. Detection of ANY malpractice regarding the lab course will also lead to awarding an F grade.

Naming Conventions for Submission
Submit a single ZIP (.zip) file (do not submit in any other archived formats like .rar, .tar, .gz). The name of this file must be ASSG<NUMBER>_<ROLLNO>_<FIRST-NAME>.zip (For example: ASSG1_BxxyyyyCS_LAXMAN.zip). DO NOT add any other files (like temporary files, input files, etc.) except your source code, into the zip archive. The source codes must be named as
ASSG<NUMBER>_<ROLLNO>_<FIRST-NAME>_<PROGRAM-NUMBER>.<extension>
(For example: ASSG1_BxxyyyyCS_LAXMAN_1.c).
If you do not conform to the above naming conventions, your submission might not be recognized by some automated tools, and hence will lead to a score of 0 marks for the submission. So, make sure that you follow the naming conventions.

Standard of Conduct
Violations of academic integrity will be severely penalized. Each student is expected to adhere to high standards of ethical conduct, especially those related to cheating and plagiarism. Any submitted work MUST BE an individual effort. Any academic dishonesty will result in zero marks in the corresponding exam or evaluation and will be reported to the department council for record keeping and for permission to assign F grade in the course. The department policy on academic integrity can be found at: http://cse.nitc.ac.in/sites/default/files/Academic-Integrity.pdf.

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. **You are instructed to submit the questions 1 and 2 only, on Eduserver.** The remaining questions are given for practice.

Questions

1. Write a C program that reads an array of n integers and check whether a given integer is present in the array. If it is present in the array, print the position of the element in the array(array indexing starts from 0). If the element presents more than once in the array then print all the positions where the element is present in the array. Otherwise, print -1. (Hint:Use linear search)

   Input : Number of elements in the array : 6
   Elements: 4, 3, 12 , 5 , 4, 3
   Enter the element to be searched : 4
   Output: Position of element is : 0, 4

   Input : Number of elements in the array : 6
   Elements: 7, 8, 12 , 5 , 4, 3
   Enter the element to be searched : 6
   Output: Position of element is : -1

2. Write a program that reads an array of n integers and sorts the array elements in ascending order using **bubble sort** algorithm.

   Input : Number of elements in the array : 6

   Elements: 3, 6, 12 , 5 , 4, 9

   Output: Sorted array is : 3, 4, 5, 6, 9, 12

3. Write a C program to convert a given binary number (base 2) to its equivalent decimal number (base 10). For example, the decimal number corresponding to the binary number $(1011)_2$ is $1*2^0 + 1*2^1 + 0*2^2 + 1*2^3 = 11$

   Input: Enter a binary number: 110110111

   Output: The equivalent decimal number: 439

4. Write a C program to circular shift an array of integers of size n from left to right by k elements. If k>n, then take k=k%n, where ***n*** is the size of the array and ***k*** is the number of times the array has to be shifted.

   Input: Number of elements, n= 5, k=2

   Elements are : 1,2,3,4,5

   Output: 4,5,1,2,3

5. Write a program that reads two integer arrays A and B of size ‘m’ and ‘n’ respectively. Merge arrays A and B into a single array by avoiding repeated elements. Print the resultant array.

   Input: Size of the first array 5

   Array Elements 5, 15, 8, 50, 40

   Size of the second array 7

   Array Elements 8, 50, 10, 2, 15, 5, 7

   Output: Merged array 5, 15, 8, 50, 40, 10, 2, 7

6. Write a C program to find whether a majority element exists in an integer array. If it exists in an array, print it. Otherwise, print **-**1. A majority element in an array arr[] of size n is an element that appears more than n/2 times (and hence there is at most one such element).

   Input: 1,2,2,2,5

   Output: 2

   Input: 1,2,2,4,5

   Output: -1

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