CS112 Lab: Programming and Data Structure Labs Date: 7th Mar 2017

Assignment-7 **Deadline: 11th Mar 2017**

Please ensure that your program must run using the gcc compiler of 172.16.1.3 server.

1. Write a program in C (assign7a.c) using 2-D array to take a matrix of size *n x m (n>=3, m>=3)* as input. On that matrix, perform the following operations:
    a. Determine if the matrix is invertible or not. Print the inverse matrix in the proper form.
    b. Determine if the matrix is a square matrix.
    c. If it is a square one, determine the position (i^th row, j^th column) of the element having the highest minor value.

Sample Input/output:

Input:

Enter the size of the matrix ($n \times m$) = 3, 3
Enter the elements of row 1 = 2, 3, 4
Enter the elements of row 2 = 1, 2, 3
Enter the elements of row 3 = 3, 2, 4

Output:

The entered matrix is invertible. The inverse matrix is: $\begin{matrix} 2/3 & -4/3 & 1/3 \\ 5/3 & -4/3 & -2/3 \\ -4/3 & 5/3 & 1/3 \end{matrix}$

The entered matrix is a square matrix.
The position of the element with highest minor is $i = 2, j = 1$

2. Write a program in C (filename: assign7b.c) to read a list of names. The input begins with the number of names and then each name is supplied in a single line. For simplicity, assume that there are no spaces in a name.

    Use a dynamically allocated array such that each row stores one name as a string and must be allocated an amount of memory just sufficient to store that name along with the terminating null character. Now perform a dictionary based sort on this set of names. You may use string library functions such as *strlen*, *strcmp*, *strcpy*, etc.

Sample input/output:

Input:

5
India
Australia
Kenya
NewZeland
SriLanka

Output:

Australia
India
Kenya
NewZeland
SriLanka

Program Formatting Instruction: Students are advised to write their programs with proper care. A program must have a header block consisting of programmer's name and rollno, along with date of creation. In the header, also include the objective of the program in one line. The program should be properly indented and it is expected that you will use meaningful variable names. For each functional block provide a short and relevant comment.

Submission Process: Submit your assignment (make sure your assignment can be executed in using gcc compiler) using the link- http://172.16.1.3/~samrat/CS112/submission/ Login using your rollno (ex: 1601CS01) and password. Once you login, change the password immediately. It is your responsibility to set a strong password that is not guessable by others. Upload the assignments using the specified filenames only. After the due date (mentioned at top), the uploading of files may be allowed for few more time but it will be treated as late submission. So ensure that you submit the assignment on time. There will be penalty if you are found to take any unfair means during the lab hours and during the assignment submission process. **Copying program from any other source and allowing others to copy your program, both will be penalized equally.**