

Programming and Data Structures – Section 15

Pre-Lab Practice Exercises for the Lab class on 12-01-2023

(Topics: 2-D Arrays and Strings)

- Write programs for the following problems yourself before coming to Lab on 12-01-2023
 - No need to submit the solutions. These are purely for your practice.
1. Write a program to read a character string of size less than 15. The entered characters in the string can be a mix of upper and lower case alphabets. Display the string with all the characters converted to lower case. Also display the string with all the characters converted to upper case.
 2. Write a program to do the following:
 - a. In the main function, read a character string from the keyboard and display it. Convert any upper case letters in the string into lower case. Then call the following functions: **anagram** and **change**, with the string passed as a parameter.
 - b. **anagram**: Check if any word is an anagram of another word. An anagram is formed by rearranging the letters of a word to form another word. For example, "monday" is an anagram of "dynamo".
 - c. **change**: Change a noun into its plural form on the basis of the following rules and display it:
 - i. If the word ends in "y", remove "y" and add "ies".
 - ii. If the noun ends in "s", add "es"
 - iii. In all other cases, just add "s".
 3. Fill a 4X4 two dimensional array randomly with randomly generated numbers in the range [4,8]. Display the array properly formatted. Check if any of the row, column, or principal diagonal adds up to 24. Display the contents of only those rows, columns, or diagonals and make other entries appear blank.
 4. Write a C program to read two integer values m and n. Fill an m by n matrix (m rows and n columns) with random integers in the range [1,5] by calling the **rand()** function. Find whether the following **2X2** pattern is present in the matrix. If present, display the location (row and column numbers) in the array where the pattern is present.

[0 1]

[2 3]

Test your programs by giving different inputs and checking if you are getting correct outputs.
Appropriately document your code.

No need to submit your code for these problems . These problems are purely for your practice, these would prepare you for the Lab on 12-01-2023.

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