

Relevant Programming Concepts: 2D-array, function, text file, and string

Problem 1) (15 points) Matrix Reorder

Write a C program that reorders a 4x4 matrix such that columns 1, 2, 3, 4 become 4, 3, 2, 1.

Your program must

- Read a 4x4 matrix from a file (create this file) using the function

```
void ReadMat ( FILE * in , int x [][][4]); // reads the file values into array x
```
- Reorder the columns 4, 3, 2, 1
- prints both the input matrix and flipped matrix to the screen using

```
void PrintMat(int x[][][4]); //print one 2-D array x on screen
```

Note:

- your program MUST use loop structure to read from the text file to fill in the array and to print the 2D array. No loop, 5 points deducted.
- your program should work for any 5x5 array and at least both sample code execution. 4 points will be deducted if it works for only one. 0 point for this problem if you hard-code the answer.

Sample code execution #1 (using textfile1.txt – you will create this file)

The Input Matrix is

42	66	68	66
92	4	76	17
79	85	74	71
96	93	39	3

The Output Matrix is

66	68	66	42
17	76	4	92
71	74	85	79
3	39	93	96

Sample code execution #2 (using textfile2.txt – you will create this file)

The Input Matrix is

1	10	6	66
2	20	7	77
3	30	7	88
4	40	6	99

The Output Matrix is

66	6	10	1
77	7	20	2
88	7	30	3
99	6	40	4

Problem 2) (15 points) Palindrome

A **palindrome** is a word that reads the same forward as it does backward.

- An example of a valid palindrome is the word "racecar".
- An example of a word that is not a palindrome is "trust" (it reads backwards as "tsurt").

Develop a C program that

- Ask a user to enter one word
- Decide whether the entered word is a palindrome
- Be interactive (q to quit, others to continue)

Note: assume that a maximum number of characters for one word is 50

See sample code execution below: **red – entered by a user**

Enter a word: **racecar**

racecar is a palindrome

Press q/Q to quit, others to continue: **y**

Enter a word: **trust**

trust is NOT a palindrome

Press q/Q to quit, others to continue: **t**

Enter a word: **detartrated**

detartrated is a palindrome

Press q/Q to quit, others to continue: **s**

Enter a word: **minimum**

minimum is NOT a palindrome

Press q/Q to quit, others to continue: **r**

Enter a word: **rotator**

rotator is a palindrome

Press q/Q to quit, others to continue: **q**

Goodbye

More testcases:

	Palindrome
175ece571	yes
testset	yes
classroom	NO
level	yes