CSE 240 Spring 2019 Homework 3, 2D Arrays (50 points)

Due Saturday, February 2, 2019 at 11:59PM, plus a 24-Hour grace period

---

Introduction

The aim of this assignment is to make sure that you understand and are familiar with the concepts covered in the lectures, including basic C syntax, using the strings, arrays, and multidimensional arrays. By the end of the assignment, you should have

- understood the concepts of data, data declaration, forward declaration, and manipulation of values stored in the memory.
- reviewed the array operations that you have learned in your previous programming classes;
- written a program using multidimensional arrays in C.

Note: **Do not** use pointer in this assignment. Pointer assignment will be given in the next homework.

Reading: Textbook Chapter 2, sections 2.1, 2.2, 2.3, and 2.4, and lecture slides covered.

Exercising: Complete the multiple choice questions in Textbook Section 2.12. The answers of the questions are available in course Web page.

You are expected to do the majority of the assignment outside the class meetings. Should you need assistance, or have questions about the assignment, please contact the instructor or the TA during their office hours.

You are encouraged to ask and answer questions on the course discussion board. However, do not share your answers or code in the course discussion board. **Do not cooperate with your peers in doing the individual assignments.**

Programming Assignment

For this assignment, you can use ASU General GNU GCC environment or Visual Studio. Please specify the environment that you use at the beginning of your program:

```
// State the IDE that you use: Visual Studio or GCC
```

If you use any other environment, please test it either using GCC or visual Studio before submission. If you do not specify the environment, the grader will use either GCC or Visual Studio, but not both. If you program does not compile or execute correctly, your grade will be deducted.

GCC command to compile this program: *gcc hw03q1.c -std=c99 -o output*

Execute with: *./output*

1. You are given hw03q1.c file, which contains a partially completed program. You are to follow the instructions contained in comments and complete the required functions. You will be writing functions for a program that does manipulation on 1-D and 2-D arrays. In one part, the program accepts four strings and an integer key as input from the user. The program will then use the integer key to encrypt the input strings (reversing the string and adding the key to each character in the string), decrypt the strings and then print the strings. In another function, one long user-input string is broken into sentences to count and print them. There is also a matrix operation of determinant which uses 2D integer array. Example output given below. Go through the C file and see the sample expected output below.
   [50 points]

```
CSE240 HW3: 2D Character Arrays

Enter string for encryption: This is CSE240
Enter string for encryption: homework three
Enter string for encryption: Arizona state university
Enter string for encryption: tempe

Enter a key value for encryption: 2

Encrypted Strings:
264GUE"uk"ukjV
ggtjv"mtqygoqj
{vkutgxkpw"gvcvu"cpq|ktC
grogv

Decrypted Strings:
This is CSE240
homework three
Arizona state university
tempe

Enter sentences(max 4): I am grad student. I study at ASU. I like movies.
I am grad student
 I study at ASU
 I like movies



Number of sentences= 3

CSE240 HW3: 2D Integer Arrays

Enter matrix element [0][0]: 3
Enter matrix element [0][1]: 5
Enter matrix element [0][2]: 7
Enter matrix element [1][0]: 9
Enter matrix element [1][1]: 2
Enter matrix element [1][2]: 5
Enter matrix element [2][0]: 7
Enter matrix element [2][1]: 3
Enter matrix element [2][2]: 1

 matrixA=
3 5 7
9 2 5
7 3 1

Determinant of matrix = 182
```

Note, when you create the Visual Studio project, the default location of project is similar to the file path shown in example figure above. For your convenience, you may change the project location while creating the project at the beginning in New Project dialog box.

Grading of Programming Assignment

The TA will grade your program following these steps:

(1) Compile the code. If it does not compile, 20% of the points given will be deducted. For example, if there are 20 points possible, you will earn 16 points if the program fails to compile.

(2) The TA will read your program and give points based on the points allocated to each component, the readability of your code (organization of the code, comments, meaningful variable names), logic, inclusion of the required functions, and correctness of the implementation of each function.

What to Submit?

You are required to submit your solution in a compressed format (.zip). Make sure your compressed file is label correctly - lastname_firstname3.zip. (All lowercase, do not put anything else in the name like "hw3".)

The compressed file MUST contain the following:

hw03q1.c (completed code)

No other files should be in the compressed folder.

If multiple submissions are made, the most recent submission will be graded. (Even if the assignment is submitted late.)

Where to Submit?

All submissions must be electronically submitted to the respected homework link in the course web page where you downloaded the assignment.

Late submission deduction policy

- No penalty for late submissions that are received within 24 hours after the deadline;
- 10% grade deduction for every day it is late after the grace period;
- No late submission after Tuesday at 11:59PM.