1. (100 pts) Write a program to shuffle the elements of a 2-dimensional array and check if there are any duplicates in the array.

(a) Declare a 2-dimensional array of 100 integers with 10 rows and 10 columns and insert numbers from 0-98 in order into the first 99 positions. First row should contain numbers 0-9 and second row 10-19 and so on.

(b) Read an integer from the user and insert into the last position in the array.

(c) Shuffle the array elements. You can do this by repeatedly picking two elements in the array and swapping them. You can pick a random row and a random column to randomly pick an element. Randomly pick 2 elements and swap them. Repeat the swap operation 100 times. Since we have 100 elements and we pick 2 at a time, doing the swap 100 times guarantees that very few elements will be in their original place after the shuffle.

(d) Check if the array has any duplicate elements in it and print the indexes and values of duplicate elements if there are any.

- You can work in groups of 2-4
- You can work on this during two weeks of recitations.
- Write functions to shuffle the array and to check for duplicates.
- Use scanf() and printf() only in main function

Sample outputs for this recitation is provided below. If the user enters a number > 48, there won’t be any duplicates.

Enter a number for last array location
120
There are no duplicates

If the user enters a number 0-98, there will be a duplicate pair.

Enter a number for last array location
10
data[3][5] = 10
data[8][2] = 10

Submit your program electronically using the blackboard system. Only one member of the group should send it. List the name of the group members on the top of your submission.