A. 2-D arrays 1 (40 points)

Create a C program that:

1. Declares three two-dimensional arrays. The arrays should be 10 x 10 (100 elements total). All three arrays should be declared for integers.

2. Fill two of the arrays with integers between -10 and 10. You can do this using random numbers or you can do it one at a time using `scanf`. (Using the latter approach implies that you have lots of spare time.)

3. Fill the elements of the third array with the sum of the corresponding elements of the first two arrays. For example, if the arrays are named `a`, `b`, and `c`, with `a[2][5]` = 7 and `b[2][5]` = –3, then `c[2][5]` should be assigned the value of 4.

4. Print the the 3 arrays. Format them nicely in 10 x 10 blocks so that they are easy to read.

B. 2-D arrays 2 (40 points)

Create a C program that:

1. Declares two two-dimensional arrays, each should be 10 x 10. One array should be for integers and the other for doubles.

2. Fill the integer array with numbers between 0 and 10. You can do this using random numbers or you can do it one at a time using `scanf`. (Of course, that would be extremely boring.)

3. Calculate a "local average" for each element in the integer. The local average is defined as the as the average of of an element and its four nearest neighbors (one up, one down, one left, and one right.) Fill the elements of the double array with the local averages from the integer array. For example, if `a` is the integer array and `b` is the double array, the element `b[4][6]` of the double array would be found using:

```
    b[4][6] = ( a[4][6] + a[3][6] + a[5][6] + a[4][5] + a[4][7] )/5.0;
```

or more abstractly:

```
  b[i][j] = (a[i][j] + a[i-1][j] + a[i+1][j] + a[i][j-1] + a[i][j+1])/5.0;
```

(Draw a picture to help you visualize what is going on.)
Note: You will have to take account of the boundaries of the integer array. Along the "sides" of the array, there are only three nearest neighbors, so that average will have to be over the element and three nearest neighbors. In the corners, there are only 2 nearest neighbors. Again, a simple sketch will help you see better what to do.

4. Print the the 2 arrays. Format them nicely in 10 x 10 blocks so that they are easy to read.

C. Quiz (20 points)

As usual, there will be a short quiz. The quiz will be on arrays again.