IT 210 Programming Assignment 2 – Due Friday, October 28 at 11:59 pm

Your program should do the following:

1. Prompt the user for a file name. If you get an answer that begins with 'q' or 'Q' go to step 7.
2. Read the file that contains four lines with 4 integers each. Each integer is a positive 1- or 2-digit number.
3. Using a function, print the 16 numbers in a square as shown below.
4. Determine if the numbers form a magic square. In a magic square each row, column and the two diagonals each add up to the same sum (always 34) and each value from 1 to 16 is used exactly once in the square. Each of the tests as noted in the next step should be written as a function that prints necessary messages and returns a True if all of its tests pass and False otherwise. Your main function should print "It is a magic square" only if all the tests pass. Each function should be appropriately named and be passes the entire square as its only parameter.
5. Print whether or not it is a magic square. If it is not, print all of the reasons found:
    a. Bad row sum = ___
    b. Bad column sum = ___
    c. Bad diagonal sum = ___
    d. Not every integer used exactly once.
6. Loop back to step 1 and do this for another square.
7. Print "Done."

I will test your program with different squares (some magic, some not) to verify that you have performed all the necessary tests to verify that the square is magic. There are files with sample squares, some magic, some not, on D2L. Make up some of your own as well.

```
Which file? sq1.txt
 16  3  2 13
  5 10 11  8
  9  6  7 12
  4 15 14  1

It is a magic square.

Which file? sq2.txt
 16  3  2 13
  9  6  7 12
  4 15 14  1
  5 10 11  8

Bad diagonal sum = 44
Bad diagonal sum = 40

Which file? sq3.txt
 15  3  2 13
  9  6  7 12
  4 15 14  1
  5 10 11  8

Bad row sum = 33
Bad column sum = 33
Bad diagonal sum = 43
Bad diagonal sum = 40
Not every integer used exactly once.

Which file? q
Done.
```

Submit your program to the designated D2L drop box. Your program should be named **PA2.py**. For programming assignments, early submissions gain a bonus percent: 1 day early – 10%; 3 or more days early – 20%.