**Homework 7**

**Due: Sunday (see Syllabus)**

**Points: 40**

**Instructions**

A magic square is a matrix of integers where the sum of each row, the sum of each column, and the sum of each main diagonal are all exactly the same number. We’ll call this number the “magic number.” Magic squares can be of any size.

Using **NumPy** to contain the matrix, write a program that repeatedly:

1. Reads the next matrix from a data file.
2. Determines if the matrix is a magic square. If it is, it prints the magic number; if not, states that the matrix is not a magic square.
3. Repeats until no matrices remain in the file.

Use a fruitful function called **magic()** to determine whether the matrix is a magic square or not and returns the value of the magic number if it is or returns -1 if the matrix is not a magic square.

The main driver should handle the input of the matrices and calling magic(). Since we have not covered file input yet, I suggest you use the code in ReadSquares.py to handle reading the square data. Although it is a standalone program right now (run it!), you can extract the important parts of the code and incorporate them into your solution to this assignment.

Run your program several times using different inputs – sufficient to demonstrate that your program meets all the assignment requirements. One of your inputs must be the file **squaredata.txt**. Capture a screen shot of each run and paste them into an MS Word document. Place a caption above each image.

**Submit the Python .py file (lastname\_hw7.py) containing your program and the MS Word document** **to your instructor using the appropriate Assignment Submissions link.**

Attach: ***ReadSquares.py***

***SquareData.txt***

**Sample Output (the first portion of the output from using squaredata.txt):**

Text

Description automatically generated