**ENGR 29700 – Senkpeil
Assignment #8**

**NOTE: Add a comment to each section of your code to note what part of each problem it was written to answer. Write all of the code to complete this problem in an executive function and several user defined functions. Make sure that all of your code is present in these scripts. Do not perform any calculations in the command window that are not recreated in your scripts.**

Write an ***executive function*** and ***several user defined functions*** that will perform the following actions:

1. Prompt the user to input a single positive integer. Validate the input and prompt the user to re-enter until a positive integer is given.
2. Create a matrix using the following code:

*mat = magic(n)*

Where n is the positive integer input by the user. Note, this will create a matrix called *mat* that is n x n in size.

1. Create a new matrix called *mat\_update*, where each element in *mat\_update* is equal to the mean of the surrounding elements at the corresponding location in *mat*.

**Example:**

If user inputted 4, the result of magic(4) would be:

$$\begin{matrix}16&2&3&13\\5&11&10&8\\9&7&6&12\\4&14&15&1\end{matrix}$$

*mat\_update(1,1)* would be the mean of the values adjacent to *mat(1,1).* Since *mat(1,1)* is on the corner, *mat\_update(1,1) = (5 + 2)/2 = 3.5*

*mat\_update(1,2)* would be the mean of the values adjacent to *mat(1,2).* Since *mat(1,2)* is on the edge, *mat\_update(1,2) = (16 + 11 + 3) / 3 = 10*

*mat\_update(2,2)* would be the mean of the values adjacent to *mat(2,2)*. Since *mat(2,2)* is in the middle, *mat\_update(2,2) = (5 + 2 + 10 + 7) / 4 = 6*

Following this pattern, the final result will be:

$$\begin{matrix}3.5&10&8.33&5.5\\12&6&7&11.67\\5.33&10&11&5\\11.5&8.67&7&13.5\end{matrix}$$

1. Once you have created *mat\_update,* use the disp() command to display the matrix to the screen

**Test Cases:**





