COMP 125: Programming with Python, Fall 2021
Final – January 15, 2022

Question 3 (20 points): 19:50-20:15 (should be submitted by 20:20)

For this question download the files **'input.csv'** and **'Q3.py'**. Make sure that both files are located in your current working directory in Spyder.

Implement the function **read_array**. This function reads the array data from a CSV file. The filename is received as the parameter **infile**. The first line of the CSV file contains the row and column numbers for the array. The remaining lines contain the row (i) and column (j) indices and the value (v) for all nonzero elements as i,j,v. The function returns an ndarray where the nonzero elements are set according to the data in infile. All other elements are set to zero. The implementation should be general, i.e., it should work for any other CSV file with the same format.

You can assume that the contents of the CSV file are always correct (i.e., you do NOT have to perform any checks on the data).

Sample input CSV file contents (left) and their explanation (right) are shown below (for only the first 5 lines are shown)

5,6	Array has 5 rows and 6 columns
0,2,1	Array item with row index 0 and column index 2 has value 1
1,2,3	Array item with row index 1 and column index 2 has value 3
0,1,4	...
4,5,2	
...	

Expected output from the code in Q3.py after implementation:

```
[[ 6.  4.  1.  0.  0.  2.]
 [ 0.  0.  3.  0.  0.  4.]
 [ 3.  0.  0. -1.  2.  0.]
 [ 0. -2.  3.  0.  0.  0.]
 [ 2.  1.  0.  1.  1.  2.]]
```

For this question, download the Q3.py file from Blackboard. Implement your code in this py file and then upload it to Blackboard before 20:20.