14. Sort the Matrix Diagonally A matrix diagonal is a diagonal line of cells starting from some cell in either the topmost row or leftmost column and going in the bottom-right direction until reaching the matrix's end. For example, the matrix diagonal starting from mat[2][0], where mat is a 6 x 3 matrix, includes cells mat[2][0], mat[3][1], and mat[4][2]. Given an m x n matrix mat of integers, sort each matrix diagonal in ascending order and return the resulting matrix.

Code:

```
from collections import defaultdict

def diagonal_sort(mat):
    diagonals=defaultdict(list)
    m,n=len(mat),len(mat[0])
    for i in range(m):
        for j in range(n):
            diagonals[i-j].append(mat[i][j])
    for key in diagonals:
        diagonals[key].sort()
    for i in range(m):
        for j in range(n):
            mat[i][j]=diagonals[i-j].pop(0)
    return mat
mat=[[3,3,1,1],
    [2,2,1,2],
    [1,1,1,2]]
print(diagonal_sort(mat))
```

output:

Time complexity:

F(n)=o(m*n(nlogn))