UNIVERSIDAD TECNOLOGICA DE LA MIXTECA

Labor et
Sapientia
Libertas

Chun quiaa Tiaha sihi Nillao

OAXACA

Maestría en Ciencia de Datos.
Programación

M.T.A.C. Erik German Ramos Pérez

Tarea Matrices
Melchor Nolasco Cosijoeza
Grupo: Propedeutico

18 de septiembre de 2024

Ejercicio 1

Un cuadrado magico es una matriz de numeros enteros, en donde la suma de los numeros por columnas, filas y diagonales principales sea la misma. Dada una matriz de 3x3 mostrar **True** si es un cuadrado magico y **False** si no lo es.

```
def isMagic(matrix):
    rowsNumber = len(matrix)
    colsNumber = len(matrix[0])

    magicNumber = 0
    # Rows
    sum = 0
    for i in range(rowsNumber):
        for j in range(colsNumber):
            sum += matrix[i][j]
        if i == 0:
            magicNumber = sum
        else:
            if sum != magicNumber:
                return False
        sum = 0

    # Columns
    sum = 0
    for j in range(colsNumber):
        for i in range(rowsNumber):
            sum += matrix[i][j]
        if sum != magicNumber:
            return False
        sum = 0

    # Diagonals
    sumRight = 0
    sumLeft = 0
    j = rowsNumber - 1
    for i in range(rowsNumber):
        sumRight += matrix[i][i]
        sumLeft += matrix[i][j]
        j -= 1
    if sumRight != magicNumber:
        return False
    if sumLeft != magicNumber:
        return False

    return True
```

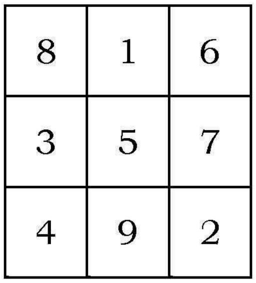
8	1	6
3	5	7
4	9	2

8	1	6
3	5	7
4	9	2

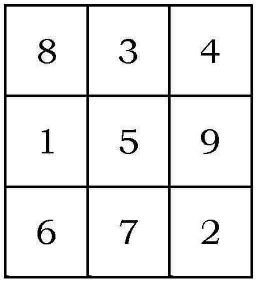
	0	**1**	**2**
0	8	1	6
1	3	5	7
2	4	9	2

i	j
0	2
1	1
2	0

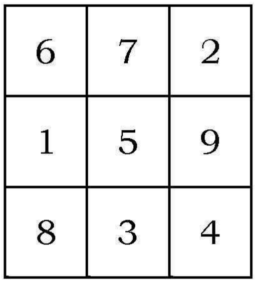
Pruebas



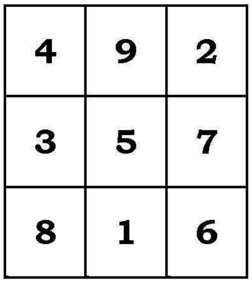
8	1	6
3	5	7
4	9	2



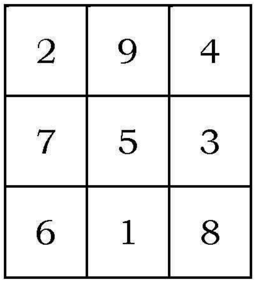
8	3	4
1	5	9
6	7	2



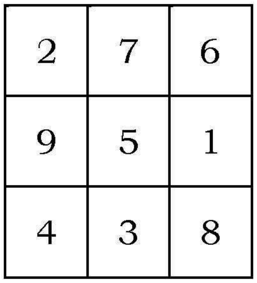
6	7	2
1	5	9
8	3	4



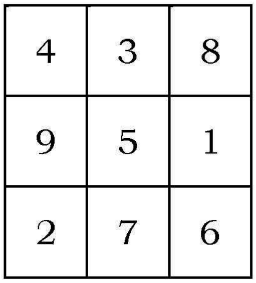
4	**9**	**2**
3	**5**	**7**
8	**1**	**6**



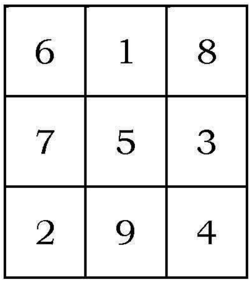
2	9	4
7	5	3
6	1	8



2	7	6
9	5	1
4	3	8



4	3	8
9	5	1
2	7	6



6	1	8
7	5	3
2	9	4

```
m = [[8, 1, 6], [3, 5, 7], [4, 9, 2]]
print(m,isMagic(m))
m = [[8, 3, 4], [1, 5, 9], [6, 7, 2]]
print(m,isMagic(m))
m = [[6, 7, 2], [1, 5, 9], [8, 3, 4]]
print(m,isMagic(m))
m = [[4, 9, 2], [3, 5, 7], [8, 1, 6]]
print(m,isMagic(m))
m = [[2, 9, 4], [7, 5, 3], [6, 1, 8]]
print(m,isMagic(m))
m = [[2, 7, 6], [9, 5, 1], [4, 3, 8]]
print(m,isMagic(m))
```

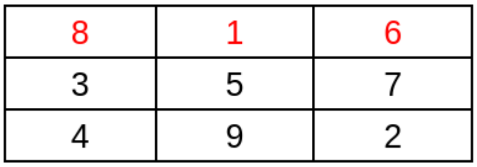
```
[[8, 1, 6], [3, 5, 7], [4, 9, 2]] True
[[8, 3, 4], [1, 5, 9], [6, 7, 2]] True
[[6, 7, 2], [1, 5, 9], [8, 3, 4]] True
[[4, 9, 2], [3, 5, 7], [8, 1, 6]] True
[[2, 9, 4], [7, 5, 3], [6, 1, 8]] True
[[2, 7, 6], [9, 5, 1], [4, 3, 8]] True
```

```
m = [[6, 1, 8], [7, 5, 3], [2, 9, 1]]
print(m,isMagic(m))
m = [[4, 3, 8], [9, 5, 4], [2, 7, 6]]
print(m,isMagic(m))
m = [[2, 9, 6], [9, 5, 1], [4, 3, 8]]
print(m,isMagic(m))
m = [[2, 9, 5], [7, 5, 3], [6, 1, 8]]
print(m,isMagic(m))
```

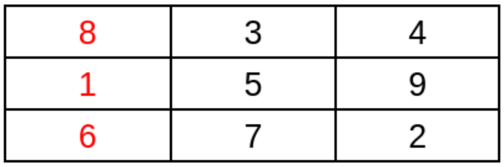
```
[[6, 1, 8], [7, 5, 3], [2, 9, 1]] False
[[4, 3, 8], [9, 5, 4], [2, 7, 6]] False
[[2, 9, 6], [9, 5, 1], [4, 3, 8]] False
[[2, 9, 5], [7, 5, 3], [6, 1, 8]] False
```

Ejercicio 2

La transpuesta de una matriz es la matriz que se obtiene al considerar sus filas como columnas y viceversa. Dada una matriz de 3x3 imprimir su transpuesta.



8	1	6
3	5	7
4	9	2



8	3	4
1	5	9
6	7	2

```
def transposed(matrix):
    numberRows = len(matrix)
    numberCols = len(matrix[0])

    for j in range(numberCols):
        for i in range(numberRows):
            print(matrix[i][j], " ", end="")
        print("")
```

Pruebas

```
m = [[8, 1, 6], [3, 5, 7], [4, 9, 2]]
print(m)
transposed(m)
```

```
[[8, 1, 6], [3, 5, 7], [4, 9, 2]]
8  3  4
1  5  9
6  7  2
```

```
m = [[4, 3, 8], [9, 5, 4], [2, 7, 6]]
transposed(m)
```

```
4  9  2
3  5  7
8  4  6
```

```
m = [[2, 9, 6], [9, 5, 1], [4, 3, 8]]
transposed(m)
```

```
2  9  4
9  5  3
6  1  8
```