Task 4

Q1. Matrix Diagonal Sum
Given a square matrix mat, return the sum of the matrix diagonals.

Only include the sum of all the elements on the primary diagonal and all the elements on the secondary diagonal that are not part of the primary diagonal.
Input: mat = [[1,2,3],
[4,5,6],
[7,8,9]]
Output: 25

Q2. Transpose Matrix
Given a 2D integer array matrix, return the transpose of matrix.
The transpose of a matrix is the matrix flipped over its main diagonal, switching the matrix's row and column indices.

Input: matrix = [[1,2,3],[4,5,6],[7,8,9]]
Output: [[1,4,7],[2,5,8],[3,6,9]]

Q3. Maximum Population Year
You are given a 2D integer array logs where each logs[i] = [birthi, deathi] indicates the birth and death years of the ith person.
The population of some year x is the number of people alive during that year. The ith person is counted in year x's population if x is in the inclusive range [birthi, deathi - 1]. Note that the person is not counted in the year that they die.
Return the earliest year with the maximum population.

Example 1:

Input: logs = [[1993,1999],[2000,2010]]
Output: 1993

Q4. Rotate by 90 degree

Given a square matrix of size N x N. The task is to rotate it by 90 degrees in anti-clockwise direction without using any extra space.

Example 1:
Input:
N = 3
matrix[][] = {{1, 2, 3},
{4, 5, 6}
{7, 8, 9}}
Output:
Rotated Matrix:
3 6 9
2 5 8
1 4 7

Q5. Flipping an Image

Given an n x n binary matrix image, flip the image horizontally, then invert it, and return the resulting image.

To flip an image horizontally means that each row of the image is reversed.

For example, flipping [1,1,0] horizontally results in [0,1,1].

To invert an image means that each 0 is replaced by 1, and each 1 is replaced by 0.

For example, inverting [0,1,1] results in [1,0,0].

Example 1:

Input: image = [[1,1,0],[1,0,1],[0,0,0]]

Output: [[1,0,0],[0,1,0],[1,1,1]]

Explanation: First reverse each row: [[0,1,1],[1,0,1],[0,0,0]].

Then, invert the image: [[1,0,0],[0,1,0],[1,1,1]]