FISION

Zurich, 2016

Coding Challenge II

1. Overview

You are given an N x N matrix with 0 and 1 values. You can swap any two adjacent rows of the matrix.
Your goal is to have all the 1 values in the matrix below or on the main diagonal. That is, for each X where $1 \leq X \leq N$, there must be no 1 values in row X that are to the right of column X.
Return the minimum number of row swaps you need to achieve the goal.

2. Input

The first line of input gives the number of cases, T. T test cases follow.
The first line of each test case has one integer, N. Each of the next N lines contains N characters. Each character is either 0 or 1.

3. Output

For each test case, output

Case #X: K

where X is the test case number, starting from 1, and K is the minimum number of row swaps needed to have all the 1 values in the matrix below or on the main diagonal.
You are guaranteed that there is a solution for each test case.

4. Limits and Datasets

Limits:	$1 \leq T \leq 60$
Small dataset:	$1 \leq N \leq 8$
Large dataset:	$1 \leq N \leq 40$

5. Sample

Input	Output
3 2 10 11 3 001 100 010 4 1110 1100 1100 1000	Case #1: 0 Case #2: 2 Case #3: 4