

Problem J. Cliques

Time limit: 4s

Color of balloons: purple

In graph theory, we call a subgraph of a undirected graph clique if each pair of nodes in it owns an edge between them. Consider a undirected graph G with n nodes. We hope to modify G into a new graph such that each connected component of it should be a clique. Each step of modification can be inserting a new edge or deleting an edge which has already existed.

Input

The first line of the input contains an integer t which is the number of test cases. For each test case, the first line consists of an integer n ($1 \leq n \leq 100$) which is the number of nodes in undirected graph G . Each of the following n lines consists of n integers corresponding to the adjacency matrix of G where 1 represents the existence of the edge and 0 otherwise.

Output

For each test case, output first the case number, see the sample output. There should be a space after the colon in each test case. Then, if the graph G can be modified into a new graph with no more than ten steps, output the minimum number of steps we need, or -1 if not.

Sample

| standard input | standard output |
|----------------|-----------------|
| 2 | Case #1: 2 |
| 7 | Case #2: 0 |
| 0 1 1 0 0 0 0 | |
| 1 0 1 1 0 0 0 | |
| 1 1 0 1 0 0 0 | |
| 0 1 1 0 1 0 0 | |
| 0 0 0 1 0 1 1 | |
| 0 0 0 0 1 0 1 | |
| 0 0 0 0 1 1 0 | |
| 1 | |
| 0 | |