Triangulation

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

DreamGrid has a point set P of n points. The points are labeled from 1 to n.

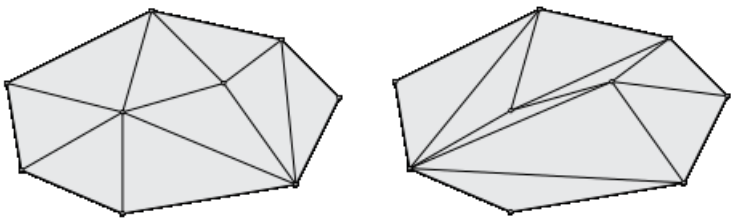
He would like to draw some segments between some pairs of points such that the final result forms a triangulation. The cost for drawing segment between points u and v is $w_{u,v}$.

DreamGrid would like to know the minimum total cost and the number of triangulations which can achieve the minimum total cost.

A triangulation of a point set P is a collection $\mathcal{T}$ of triangles, such that

1. $\text{conv}(P) = \bigcup_{T \in \mathcal{T}} T$, where $\text{conv}(P)$ is the convex hull of P.
2. $P = \bigcup_{T \in \mathcal{T}} V(T)$, where $V(T)$ is the set of three vertices of triangle T.
3. For every distinct pair $T, U \in \mathcal{T}$, $T \cap U$ is either a common vertex, or a common edge, or empty.

For example, the following are two different triangulations of the same set of 9 points.



From Wikipedia. https://en.wikipedia.org/wiki/Point_set_triangulation

Input

There are multiple test cases. The first line of input contains an integer T (about 70), indicating the number of test cases. For each test case:

The first line contains an integer n ($3 \le n \le 18$) – the number of points.

Each of the next n lines contains two integers x_i and y_i ($0 \le x_i, y_i \le 10^6$), denoting the coordinates of the i-th point. No three points lie on the same line.

The i-th of the next n lines contains n integers $w_{i,1}, w_{i,2}, \ldots, w_{i,n}$ ($0 \le w_{i,j} \le 10^6, w_{i,i} = 0, w_{i,j} = w_{j,i}$), indicating the cost for drawing segments.

Output

For each test case, output two integers denoting the minimum cost and the number of triangulations.

Example

standard input	standard output
2 4 0 0 1 1 1 0 0 1 0 1 1 1 1 0 1 1 1 1 0 1 1 1 1 0 4 0 0 3 0 1 3 1 1 0 1 1 1 1 0 1 1 1 1 0 1 1 1 1 0	5 2 6 1