Problem J: Job for a Hobbit

Time limit: 2s, memory limit: 1GB.

One ring to rule them all, one ring to find them, One ring to bring them all, and in the darkness bind them...? Truly, Byteon the dark sorcerer could never wrap his head around this. How could have Sauron been so reckless as to let his fate depend on just one ring, and then brag about it in the inscription?

Byteon also draws his power from magic rings, but – to avoid Sauron's fate – he doesn't bet everything on one small piece of jewellery. In front of his Black Tower there is a row of n magical poles, and on each pole there are exactly k coloured rings.

The good wizard Bitalf has prophesied that strength has its roots in diversity, and Byteon will lose it when each pole is single-coloured (or empty). Bitalf himself is reluctant to move the rings, but he conjured up two additional poles – one on the right and the other on the left side of the structure (so now there are $n + 2$ poles, the outermost ones are empty, and there are still exactly k rings on all the other poles).

The job of moving the rings fell (as always) on a hobbit, Bitbo Byteins. Each day, Bitbo will climb unnoticed onto one of the poles and move the topmost ring from that pole onto the top of one of the adjacent poles. Fortunately, Byteon's evil eye has lost its vigilance over the years and will not notice the tiny hobbit nor the difference in the rings. What complicates the task, though, is the fact that no pole can fit more than k rings.

Nobody is sure whether Bitalf's prophecy makes sense and the rings can be moved accordingly. Help the brave hobbit prepare a plan! It should be no longer than a million days so that Bitbo has a chance to live until the end of the story.

Input

The first line of input contains the number of test cases z ($1 \leqslant z \leqslant 25$). The descriptions of the test cases follow.

In the first line of the test case there are two integers n, k ($1 \leqslant n \leqslant 50$, $1 \leqslant k \leqslant 10$).

In each of the following n lines there is a sequence of numbers: $a_{i1}, a_{i2}, ..., a_{ik}$ ($0 \leqslant a_{ij} \leqslant 10^9$), denoting rings on the i-th pole given in order from the bottom to the top. The poles marked with numbers 0 and $n + 1$ exist, but are initially empty.

Sum of n among all test cases does not exceed 50.

Output

For each test case, write `TAK` if it is possible to defeat Byteon by placing the rings so that each pole has rings of at most one colour, or `NIE` otherwise.

If the answer is affirmative, in the following lines output a plan to accomplish the goal. In the first line, output the number of moves p ($0 \leqslant p \leqslant 10^6$). In each of the following p lines, output two integers a_i, b_i ($0 \leqslant a_i, b_i \leqslant n + 1, |a_i - b_i| = 1$), which means that Bitbo should move the top ring from the a_i-th pole to the top of the b_i-th pole. Before performing this operation, pole a_i must not be empty, while pole b_i must contain less than k rings.

If there are many possible plans, you can print any of them, as long as you fit within the limit of 10^6 moves.

Example

For an example input:	A possible correct output is:
2 2 2 1 2 2 1 1 4 1 2 3 4	TAK 2 1 0 2 1 NIE