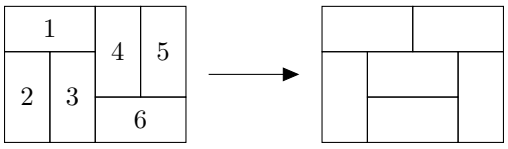
Problem L - Domino Rotations

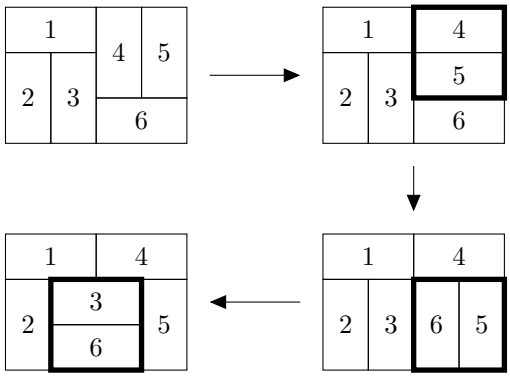
Consider two domino tiling on a $m \times n$ rectangular board. Is it possible to go from one to another by subsequently rotate some 2×2 squares formed by two vertical or horizontal dominos?

The numbers on the dominoes do not matter. They are only to help us clarify how the rotations work.

For example, if we are given the following two tilings:



Then we can achieve this task in three steps:



Now you are given two layouts of domino tilings, with label of numbers in the first one. Please find out the **minimum number** of rotations starting from the first one to the second one if possible.

Input

The first line contains an integer T ($1 \leq T \leq 100$), denoting the number of test cases.

For each test case, the first line contains two integers m, n ($1 \leq m, n \leq 90$) indicating the number of rows and the number of columns of the board. Then exactly $4m + 3$ lines follow. It consists of two domino tilings. Please refer to the sample input. All numbers will be distinct and will be represented in base-16.

Output

For each test case, please output a number r first, indicating the minimum number of rotations you can achieve. In case there is no solution, please output $r = -1$.

If there is a solution, please output another r lines. Each of these lines contains two base-16 integers x, y indicating the two dominoes that are to be rotated. The rotations will always be **right turns**. Any valid minimum length script of rotations will be accepted. Do not output leading zeroes.

Sample Input

```
1
3 4
+-+-+-+-+
|001|0|1|
+-+-+9+2+
|0|0|A|3|
+6+0+-+-+
|2|3|5E4|
+-+-+-+-+

+-+-+-+-+
|   |   |
+-+-+-+-+
| |   | |
+ +-+-+ +
| |   | |
+-+-+-+-+
```

Sample Output

```
3
9A 123
123 5E4
3 5E4
```