Matrix Multiplication

Ming is a former rhythm game player. After realizing that his world rank of 384 is mostly due to farming overrated maps and that he actually sucks (while also failing to qualify for the IOI in the process), Ming decided to go back to competitive programming where he sucks less. However, due to being away from the scene for too long, he now has to relearn most things from scratch!

Today, Ming is practicing matrix multiplications. As a learning aid, he draws himself n matrices, where the i-th matrix has a_i rows and b_i columns. Every minute, Ming chooses two matrices A and B of sizes $p \times q$ and $q \times r$, respectively, then replace them with their product $A \times B$, which is a matrix of size $p \times r$. Note that the number of columns of matrix A must match the number of rows of matrix B, otherwise Ming cannot perform the multiplication. He can stop at any point, or when there is no satisfying pair of matrices to choose.

Unsurprisingly, the "learning" session gets boring quick. Just as he is about to wrap up, Ming realizes a rare property. After some of his operations, the total size across all matrices **strictly increases** compared to the beginning! Formally, let m be the number of operations Ming has done, and c_i, d_i $(1 \le i \le n-m)$ be the number of rows and columns of the i-th matrix after all operations, then:

$$\sum_{i=1}^{n} a_i b_i < \sum_{i=1}^{n-m} c_i d_i$$

Ming is very proud of his random invention and challenges you to find **any** sequence of operations that achieves the same property. Of course, since Ming has only relearned how to multiply matrices recently, he could have made a mistake and no such sequence actually exists, in which case you should inform him as well.

Input

Each test contains multiple test cases. The first line contains the number of test cases τ $(1 \le \tau \le 10)$. The description of the test cases follows.

- The first line contains an integer n $(2 \le n \le 1000)$ — the number of matrices Ming originally has.
- In the next n lines, the i-th line contains two integers a_i and b_i $(1 \le a_i, b_i \le 10^6)$ — the number of rows and columns of the i-th matrix, respectively.

Output

For each test case:

- If there exists no sequence of operations that increases the total size of the matrices, print -1.
- Otherwise, print an integer m $(1 \le m < n)$. Then, print m lines, where the j-th line contains three integers p_j, q_j, and r_j $(1 \le p_j, q_j, r_j \le 10^6)$, denoting that, for the j-th operation, Ming multiplies a matrix of size $p_j \times q_j$ with a matrix of size $q_j \times r_j$ to produce a new matrix of size $p_j \times r_j$.

If there are multiple solutions, you can output any of them.

Sample Input 1	Sample Output 1
3 4 1 4 1 5 2 5 3 6 3 36 69 18 36 67 18 2 2 1000000 1000000 1	-1 2 18 36 69 67 18 69 -1

Sample Explanation

In the first test case, there is no valid matrix multiplication using the initial matrices.

In the second test case, the total size of the matrices before all operations is $36 \cdot 69 + 18 \cdot 36 + 67 \cdot 18 = 4338$. After the operations, the size of the only matrix left is $67 \cdot 69 = 4623$.

In the third test case, the total size of the matrices before all operations is $2 \cdot 10^6 + 10^6 \cdot 1 = 3 \cdot 10^6$. The only valid operation is to multiply the first matrix with the second, resulting in a matrix of size $2 \cdot 1 = 2$.