Problem B: Babushka and her pierogi

Time limit: 15s, memory limit: 1GB.

Babushka Bajtmiła is throwing a party! And the main dish served will be her famous *pierogi*.

There will be n plates available during the party, and Babushka plans to put exactly p_i pierogi on the i-th plate (all the values p_i are distinct). Though the task seemed too heavy for an old lady, Bajtmiła has stood up to the challenge and almost instantly prepared all of the pierogi needed, divided among n plates with $(p_1, \ldots, p_n)$ pierogi. Next, Bajtmiła has distributed the plates among the plates. However, she soon realized that while she got the numbers right, she messed up the order of the plates.

Bajtmiła is quite tired and is only willing to perform one type of operation: she can choose two plates numbered i and j, and swap the amounts of pierogi on each plate. In other words, if there are x pierogi at the plate i, and y pierogi at the plate j, then after this operation there will be y pierogi at the plate i, and x pierogi at plate j. Such an operation takes exactly $|x - y| + C$ seconds to perform – C seconds for finding a proper spoon, and 1 second for each of pierogi moved.

The party is about to start very soon! Now, Bajtmiła won't allow you to touch anything in the kitchen, but she has put her trust in your algorithmic skills. She asked you to find a sequence of operations restoring the desired order of numbers, and must do it in the shortest time possible. Can you help Bajtmiła?

Input

The first line of input contains the number of test cases z ($1 \leqslant z \leqslant 1000$). The descriptions of the test cases follow.

The first line of each test case consists of two numbers n and C ($1 \leqslant n \leqslant 200\,000, 1 \leqslant C \leqslant 10^9$) with their meaning described in the statement above.

Next n lines describe consecutive plates. The i-th line contains two numbers a_i and p_i ($1 \leqslant a_i, p_i \leqslant 10^9$) indicating the current and the desired amount of pierogi on i-th plate respectively.

In each test case, numbers a_i are distinct. Furthermore, the sets $\{a_1, a_2, ..., a_n\}$ and $\{p_1, p_2, ..., p_n\}$ are the same.

The sum over values n in all test cases does not exceed 1 000 000.

Output

For each test case, your output must match the following description:

In the first line, print two integers S and K – the total time and the number of operations in your solution respectively.

Next K lines of your output should describe your solution. In the k-th line print two numbers x_k and y_k, indicating that the k-th operation in your solution swaps the amounts of pierogi at x_k-th and y_k-th plate.

After all operations from your solution, the i-th plate must contain exactly p_i pierogi.

Example

For an example input:	a possible correct output is:
1 4 2 2 4 3 2 1 1 4 3	6 2 2 1 4 1

Explanation

A sequence $(2, 3, 1, 4)$ should become the sequence $(4, 2, 1, 3)$. We first perform the operation on the first two plates, obtaining the sequence $(3, 2, 1, 4)$ at the cost $|3 - 2| + 2 = 3$. The second and final operation swaps the pierogis from the first and fourth plate, achieving the desired sequence $(4, 2, 1, 3)$. The cost of this operation is $|3 - 4| + 2 = 3$, and the total cost is 6, which is the minimal possible.