Subject Pairing (`subjects`)

Every February, 10th-grade students at the school select their optional subjects for the next academic year.

Figure 1: Teachers trying to make a timetable.

Each of the N students (numbered from 0 to $N-1$) submits a list of subjects they would like to attend. Students must choose at least one and at most five subjects from a total of M available subjects. The subjects are numbered from 1 to M (inclusive).

Your task is to help the schedule creator determine which pairs of subjects can be held simultaneously. A pair of subjects (i, j) can be scheduled at the same time if no student has chosen both subjects. Note that the pair (i, j) is considered the same as (j, i).

> ☞ Among the attachments of this task you may find a template file `subjects.*` with a sample incomplete implementation.

Input

The first line contains two integers N and M.

Each of the next N lines contains an integer K_i, indicating the number of subjects chosen by student i, followed by K_i integers $S_{i,j}$, denoting the chosen subjects.

Output

In the first line you need to write an integer P, indicating the number of pairs.

In each of the next P lines you should write two integers, denoting a pair of subjects that can be held simultaneously. You can write the pairs in arbitrary order.

Constraints

- $1 \leq N \leq 100\,000$.
- $1 \leq M \leq 1000$.
- $1 \leq K_i \leq 5$ for each $i = 0 \ldots N - 1$.
- $1 \leq S_{i,j} \leq M$ for each $i = 0 \ldots N - 1$ and $j = 0 \ldots K_i - 1$.

Scoring

Your program will be tested against several test cases grouped in subtasks. In order to obtain the score of a subtask, your program needs to correctly solve all of its test cases.

– **Subtask 1** (0 points)   Examples.
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– **Subtask 2** (30 points) $N \leq 100, M \leq 10$.
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– **Subtask 3** (20 points)   A subject may be selected by at most 1 student.
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– **Subtask 4** (50 points)   No additional limitations.
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Examples

input	output
4 5 4 1 2 3 4 1 2 2 1 5 3 2 3 1	3 2 5 3 5 5 4
5 8 4 1 2 4 6 4 3 5 7 8 5 4 7 8 2 3 4 2 7 1 4 2 3 4	9 1 5 6 5 1 3 8 1 2 5 3 6 5 4 6 7 6 8

Explanation

In the **first sample case**:

- Subjects $(1, 2)$ are selected by students: $0, 3$.
- Subjects $(1, 3)$ are selected by students: $0, 3$.
- Subjects $(1, 4)$ is selected by student: 0.
- Subjects $(1, 5)$ is selected by student: 2.

- Subjects $(2, 3)$ are selected by students: $0, 3$.
- Subjects $(2, 4)$ is selected by student: 0.
- Subjects $(3, 4)$ is selected by student: 0.

Any other pair of subjects can be held at the same time.