

## 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  $i = 0 \dots N - 1$ .
- $1 \leq S_{i,j} \leq M$  for each  $i = 0 \dots N - 1$  and  $j = 0 \dots K_i - 1$ .

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

## 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.