**Problem C**

**Matrix**

Input File: pc.in

Time limit: 5 seconds

Given *k* sets, where *k* >= 2 and each set has *n* integers, they are said to be *compatible* if a *k*×*n* matrix *B* can be constructed from them to meet the following two conditions:

* Each row of *B* is constructed from a different set and is a permutation of the integers in the corresponding set.
* For all *i* and *j*, 1 <= *i* <= *k*-1, 1 <= *j* <= *n*, *b*i,j is less than *b*i+1,j, where *b*i,j is the element at the *i*th row and *j*th column of *B*.

For example, consider two sets {6,3,5} and {1,4,2}. The two sets are compatible because a 2×3 matrix *B* can be constructed as follows to meet the above two conditions. The first row of *B* is from the second set and is [1 4 2], while the second row of *B* is from the first set and is [3 6 5].

Now consider *m* (*m* >= 2) sets each of which has *n* integers. Also assume that among the *m* sets, at least two of them are compatible. There are many possible ways to select *k* (2 <= *k* <= *m*) sets from the *m* sets. Let *k*max denote the largest number of sets which are selected from the *m* sets and are compatible. Your task is to write a program that computes *k*max.

**Technical Specification**

* The number of sets, *m*, is at least 2 and at most 2500. At least two of the *m* sets are compatible. The number of integers in each of the *m* sets, *n*, is at least 1 and at most 20. Each integer in a set is at least 1 and at most 50000.

The first line of the input file contains an integer, denoting the number of test cases to follow. For each test case, the first line contains two positive integers *m* and *n*, respectively denoting the number of sets and the number of integers in each set; in the next *m* lines, each line gives *n* integers for a set.

For each test case, output its *k*max in a new line.