

Round 2 2009

[A. Crazy Rows](#)

[B. A Digging Problem](#)

C. Stock Charts

[D. Watering Plants](#)

[Contest Analysis](#)

[Questions asked](#)

Submissions

Crazy Rows

6pt	Not attempted 1837/2092 users correct (88%)
10pt	Not attempted 1605/1744 users correct (92%)

A Digging Problem

9pt	Not attempted 193/388 users correct (50%)
17pt	Not attempted 70/152 users correct (46%)

Stock Charts

7pt	Not attempted 741/1384 users correct (54%)
21pt	Not attempted 355/537 users correct (66%)

Watering Plants

5pt	Not attempted 1251/1420 users correct (88%)
25pt	Not attempted 64/226 users correct (28%)

Top Scores

ACRush	100
winger	100
iwi	100
wata	100
bwps	100
natalia	100
Burunduk1	100
AS1	100
Khuc.Anh.Tuan	100
Nerevar	100

Problem C. Stock Charts

This contest is open for practice. You can try every problem as many times as you like, though we won't keep track of which problems you solve. Read the [Quick-Start Guide](#) to get started.

Small input
7 points

Solve C-small

Large input
21 points

Solve C-large

Problem

You're in the middle of writing your newspaper's end-of-year economics summary, and you've decided that you want to show a number of charts to demonstrate how different stocks have performed over the course of the last year. You've already decided that you want to show the price of n different stocks, all at the same k points of the year.

A *simple chart* of one stock's price would draw lines between the points $(0, \text{price}_0)$, $(1, \text{price}_1)$, \dots , $(k-1, \text{price}_{k-1})$, where price_i is the price of the stock at the i th point in time.

In order to save space, you have invented the concept of an *overlaid chart*. An overlaid chart is the combination of one or more simple charts, and shows the prices of multiple stocks (simply drawing a line for each one). In order to avoid confusion between the stocks shown in a chart, the lines in an overlaid chart may not cross or touch.

Given a list of n stocks' prices at each of k time points, determine the minimum number of overlaid charts you need to show all of the stocks' prices.

Input

The first line of input will contain a single integer T , the number of test cases. After this will follow T test cases on different lines, each of the form:

```
n k
price0,0 price0,1 ... price0,k-1
price1,0 price1,1 ... price1,k-1
...
pricen-1,0 pricen-1,1 ... pricen-1,k-1
```

Where $\text{price}_{i,j}$ is an integer, the price of the i th stock at time j .

Output

For each test case, a single line containing "Case #X: Y", where X is the number of the test-case (1-indexed) and Y is the minimum number of overlaid charts needed to show the prices of all of the stocks.

Limits

$1 \leq T \leq 100$
 $2 \leq k \leq 25$
 $0 \leq \text{price}_{i,j} \leq 1000000$

Small Input

$1 \leq n \leq 16$

Large Input

$1 \leq n \leq 100$

Sample

Input	Output
3	Case #1: 2
3 4	Case #2: 3
1 2 3 4	Case #3: 2
2 3 4 6	
6 5 4 3	
3 3	
5 5 5	
4 4 6	
4 5 4	
5 2	
1 1	
2 2	

```
5 4
4 4
4 1
```

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