

Round 1C 2010

[A. Rope Intranet](#)[B. Load Testing](#)**[C. Making Chess Boards](#)**[Contest Analysis](#)[Questions asked](#)

Submissions

Rope Intranet

9pt	Not attempted 2989/3075 users correct (97%)
13pt	Not attempted 2662/2973 users correct (90%)

Load Testing

14pt	Not attempted 1060/1468 users correct (72%)
22pt	Not attempted 829/1020 users correct (81%)

Making Chess Boards

18pt	Not attempted 640/836 users correct (77%)
24pt	Not attempted 226/547 users correct (41%)

Top Scores

ZhukovDmitry	100
darnley	100
morriship	100
xdliutao	100
Onufry	100
Clann	100
SergeyFedorov	100
kubus	100
K.A.D.R	100
Murphy	100

Problem C. Making Chess Boards

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
18 points

[Solve C-small](#)

Large input
24 points

[Solve C-large](#)

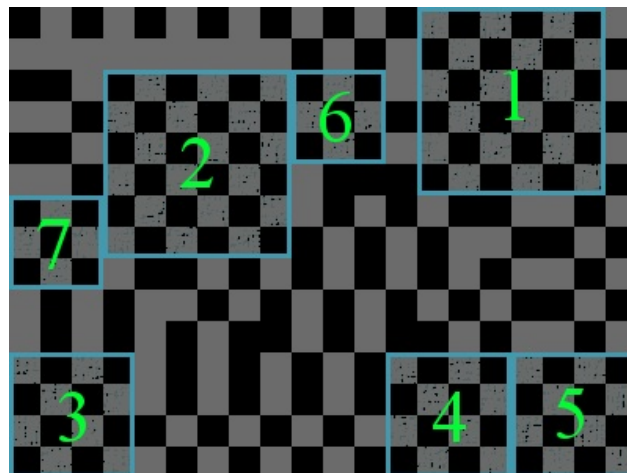
Problem

The chess board industry has fallen on hard times and needs your help. It is a little-known fact that chess boards are made from the bark of the extremely rare Croatian Chess Board tree, (*Biggus Mobydiccus*). The bark of that tree is stripped and unwrapped into a huge rectangular sheet of chess board material. The rectangle is a grid of black and white squares.

Your task is to make as many large square chess boards as possible. A chess board is a piece of the bark that is a square, with sides parallel to the sides of the bark rectangle, with cells colored in the pattern of a chess board (no two cells of the same color can share an edge).

Each time you cut out a chess board, you must choose the largest possible chess board left in the sheet. If there are several such boards, pick the topmost one. If there is still a tie, pick the leftmost one. Continue cutting out chess boards until there is no bark left. You may need to go as far as cutting out 1-by-1 mini chess boards.

Here is an example showing the bark of a Chess Board tree and the first few chess boards that will be cut out of it.



Input

The first line of the input gives the number of test cases, **T**. **T** test cases follow. Each one starts with a line containing the dimensions of the bark grid, **M** and **N**. **N** will always be a multiple of 4. The next **M** lines will each contain an (**N**/4)-character hexadecimal integer, representing a row of the bark grid. The binary representation of these integers will give you a strings of **N** bits, one for each row. Zeros represent black squares; ones represent white squares of the grid. The rows are given in the input from top to bottom. In each row, the most-significant bit of the hexadecimal integer corresponds to the leftmost cell in that row.

Output

For each test case, output one line containing "Case #x: **K**", where x is the case number (starting from 1) and **K** is the number of different chess board sizes that you can cut out by following the procedure described above. The next **K** lines should contain two integers each -- the size of the chess board (from largest to smallest) and the number of chess boards of that size that you can cut out.

Limits

$1 \leq T \leq 100$;

N will be divisible by 4;

Each hexadecimal integer will contain exactly **N**/4 characters.

Only the characters 0-9 and A-F will be used.

Small dataset

$1 \leq M \leq 32$;
 $1 \leq N \leq 32$.

Large dataset

$1 \leq M \leq 512$;
 $1 \leq N \leq 512$;
The input file will be at most 200kB in size.

Sample

Input	Output
4	Case #1: 5
15 20	6 2
55555	4 3
FFAAA	3 7
2AAD5	2 15
D552A	1 57
2AAD5	Case #2: 1
D542A	1 16
4AD4D	Case #3: 2
B52B2	2 1
52AAD	1 12
AD552	Case #4: 1
AA52D	2 4
AAAAA	
5AA55	
A55AA	
5AA55	
4 4	
0	
0	
0	
0	
4 4	
3	
3	
C	
C	
4 4	
6	
9	
9	
6	

The first example test case represents the image above.

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