

Round E APAC Test 2016

[A. Lazy Spelling Bee](#)

**B. Robot Rock Band**

[C. Not So Random](#)

[D. Sums of Sums](#)

[Questions asked](#)

#### Submissions

##### Lazy Spelling Bee

5pt	Not attempted 613/697 users correct (88%)
8pt	Not attempted 539/608 users correct (89%)

##### Robot Rock Band

6pt	Not attempted 551/580 users correct (95%)
14pt	Not attempted 301/474 users correct (64%)

##### Not So Random

11pt	Not attempted 340/366 users correct (93%)
20pt	Not attempted 124/201 users correct (62%)

##### Sums of Sums

8pt	Not attempted 447/490 users correct (91%)
28pt	Not attempted 17/102 users correct (17%)

#### Top Scores

NAFIS	100
gvaibhav21	100
codecracker4	100
shivari31	100
harshil7924	100
aniket20	100
triveni692	100
sgtlaugh	100
gsa	100
ctzsm	100

## Problem B. Robot Rock Band

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  
6 points

Solve B-small

Large input  
14 points

Solve B-large

### Problem

You're the manager of Xorbitant, the world's first robot rock band. There will be four positions in the band, and there are  $N$  robots auditioning for each position. (No robot is auditioning for more than one position.) Every robot has a number, and multiple robots might have the same number, just as two people can have the same name.

You know from market research that your robot audiences won't care how well the robot band members make music, how handsome they are, or what scandalous things the tabloids say about them. Instead, the audience will be checking to see whether the four members' numbers, when bitwise XORed together, equal a certain trendy number  $K$ .

How many different sets of four robots (one for each position) is it possible to choose so that the band will have this property? More specifically, given four lists  $A, B, C, D$  containing  $N$  numbers each, how many ways are there to choose one number  $a$  from list  $A$ , one number  $b$  from list  $B$ , and so on, such that  $a \oplus b \oplus c \oplus d = K$ ? (Here  $\oplus$  represents the bitwise XOR operation.)

### Input

The first line of the input gives the number of test cases,  $T$ .  $T$  test cases follow. Each case begins with one line with two space-separated integers,  $N$  and  $K$ , as described above. Then, four more lines follow. Each has  $N$  space-separated integers and represents the ID numbers of the robots auditioning for a certain position in the band.

### Output

For each test case, output one line containing "Case #x: y", where  $x$  is the test case number (starting from 1) and  $y$  is the number of different bands that meet the conditions.

### Limits

$1 \leq T \leq 10$ .  
 $0 \leq K \leq 10^9$ .  
 $0 \leq \text{all robot numbers} \leq 10^9$ .

### Small dataset

$1 \leq N \leq 50$ .

### Large dataset

$1 \leq N \leq 1000$ .

### Sample

Input	Output
2	Case #1: 4
2 3	Case #2: 8
0 0	
2 0	
0 0	
0 1	
2 0	
1 10	
1 10	
1 10	
1 10	

In sample case #1, in order to get a combined bitwise XOR of 3, the robot chosen from the second list must be 2, and the robot chosen from the fourth list must be 1. For the first and third lists, either of the two 0 robots can be chosen, so there are  $2 * 2 = 4$  possible bands that meet the criteria. Note that

even though all of these bands are of the form  $(0, 2, 0, 1)$ , they are considered different because the selections from the lists were different.

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