

7065 Happy Matt Friends

Matt has N friends. They are playing a game together.

Each of Matt's friends has a magic number. In the game, Matt selects some (could be zero) of his friends. If the **xor** (exclusive-or) sum of the selected friend's magic numbers is no less than M , Matt wins.

Matt wants to know the number of ways to win.

Input

The first line contains only one integer T , which indicates the number of test cases.

For each test case, the first line contains two integers N, M ($1 \leq N \leq 40, 0 \leq M \leq 10^6$).

In the second line, there are N integers k_i ($0 \leq k_i \leq 10^6$), indicating the i -th friend's magic number.

Output

For each test case, output a single line 'Case # x : y ', where x is the case number (starting from 1) and y indicates the number of ways where Matt can win.

Hint: In the first sample, Matt can win by selecting:

- friend with number 1 and friend with number 2. The **xor** sum is 3.
- friend with number 1 and friend with number 3. The **xor** sum is 2.
- friend with number 2. The **xor** sum is 2.
- friend with number 3. The **xor** sum is 3. Hence, the answer is 4.

Sample Input

```
2
3 2
1 2 3
3 3
1 2 3
```

Sample Output

```
Case #1: 4
Case #2: 2
```