Xavier, a 9-year-old student, loves playing many kinds of puzzles. One of his favourites is the following:

Xerier, his classmate, has made many cards. She writes down a single positive number on each of them. No numbers written on different cards are the same. After that she writes down an equation, whose right side is a single positive number chosen by her, and the left side is the sum of p integers:

$$X_1 + X_2 + \cdots + X_p = n$$

Then she asks Xavier put p cards on the corresponding X_i's position to make this equation correct, **with an additional condition that X_i should be ordered from smaller to bigger**, i.e.

$$X_i < X_{i+1}, \quad \forall i,\ 1 \leq < p$$

Every time Xavier immediately comes up with many solutions. Now he wants to know how many solutions in total are there for any n given by Xerier.

Input

There are multiple test cases. The number of them is given in the beginning of the input. Then a series of input block comes one by one.

For each test case:

The first line contains two space-separated integers m and p ($1 \leq p \leq 5$). The second line contains m distinct positive integers — the numbers written on each of the cards. None of these integers exceeds 13000.

There are about 120 test cases in total, but 90% of them are relatively small. More precisely, all numbers are less than or equal to 100 in 90% of the test cases.

Output

For each test case:

For each positive integer, output the number of ways in a single line. To keep the output finite, only numbers with positive ways should be outputted.

Output a blank line after each test case. See sample for more format details.

Sample Input

```
3
3 3
1 2 3
5 4
1 3 5 6 7
10 3
1 2 3 4 5 6 7 8 9 10
```

Sample Output

```
Case #1:
6: 1

Case #2:
15: 1
16: 1
17: 1
19: 1
21: 1

Case #3:
6: 1
7: 1
8: 2
9: 3
10: 4
11: 5
12: 7
13: 8
14: 9
15: 10
16: 10
17: 10
18: 10
19: 9
20: 8
21: 7
22: 5
23: 4
24: 3
25: 2
26: 1
27: 1
```