Problem D. Ice Cream Tower

```
Input file:     Standard Input
Output file:    Standard Ouptut
Time limit:     6 seconds
```

Mr. Panda likes ice cream very much especially the ice cream tower. An ice cream tower consists of K ice cream balls stacking up as a tower. In order to make the tower stable, the lower ice cream ball should be at least twice as large as the ball right above it. In other words, if the sizes of the ice cream balls from top to bottom are A_0, A_1, A_2, $\cdots$, A_{K-1}, then $A_0 \times 2 \leq A_1$, $A_1 \times 2 \leq A_2$, etc.

One day Mr. Panda was walking along the street and found a shop selling ice cream balls. There are N ice cream balls on sell and the sizes are B_0, B_1, B_2, $\cdots$, B_{N-1}. Mr. Panda was wondering the maximal number of ice cream towers could be made by these balls.

Input

The first line of the input gives the number of test cases, T. T test cases follow. Each test case starts with a line consisting of 2 integers, N the number of ice cream balls in shop and K the number of balls needed to form an ice cream tower. The next line consists of N integers representing the size of ice cream balls in shop.

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 maximal number of ice cream towers could be made.

Limits

- $1 \leq T \leq 100$.
- $1 \leq N \leq 3 \times 10^5$.
- $1 \leq K \leq 64$.
- $1 \leq B_i \leq 10^{18}$.

Sample input and output

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