Stone Division, Revisited

HackerRank

You have a pile of n stones that you want to split into multiple piles, as well as a set, S, of m distinct integers. We define a *move* as follows:

- First, choose a pile of stones. Let's say that the chosen pile contains y stones.
- Next, look for some $x \in S$ such that $x \neq y$ and y is divisible by x (i.e., x is a factor of y); if such an x exists, you can split the pile into $\frac{y}{x}$ equal smaller piles.

You are given q queries where each query consists of n and S. For each query, calculate the maximum possible number of moves you can perform and print it on a new line.

Input Format

The first line contains an integer, q, denoting the number of queries. The $2 \cdot q$ subsequent lines describe each query in the following format:

1. The first line contains two space-separated integers describing the respective values of n (the size of the initial pile in the query) and m (the size of the set in the query).
2. The second line contains m distinct space-separated integers describing the values in set S.

Constraints

- $1 \leq q \leq 10$
- $1 \leq n \leq 10^{12}$
- $1 \leq m \leq 1000$
- $1 \leq s_i \leq 10^{12}$

Subtask

- $1 \leq m \leq 10$ for 30% of the maximum score.

Output Format

For each query, calculate the maximum possible number of moves you can perform and print it on a new line.

Sample Input 0

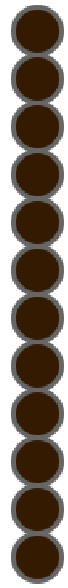
```
1
12 3
2 3 4
```

Sample Output 0

```
4
```

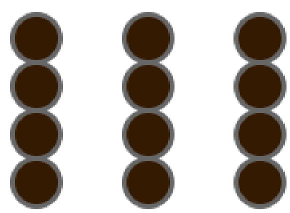
Explanation 0

Initially there is a pile with 12 stones:

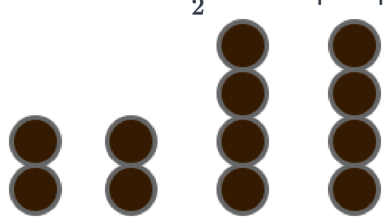


You can make a maximal 4 moves, described below:

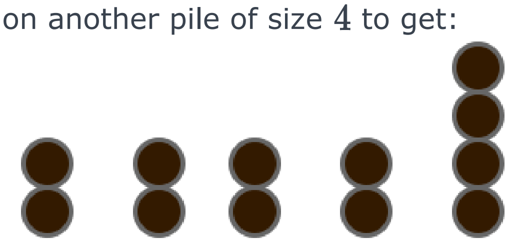
- Select $x = 4$ from S and split it into $\frac{12}{4} = 3$ equal piles of size 4 to get:



- Select $x = 2$ from S and split a pile of size 4 into $\frac{4}{2} = 2$ equal piles of size 2 to get:



- Repeat the previous move again on another pile of size 4 to get:



- Repeat the move again on the last pile of size 4 to get:

As there are no more available moves, we print 4 (the number of moves) on a new line.