B - Ancestors

He who does not know his origin, does not know his destination.

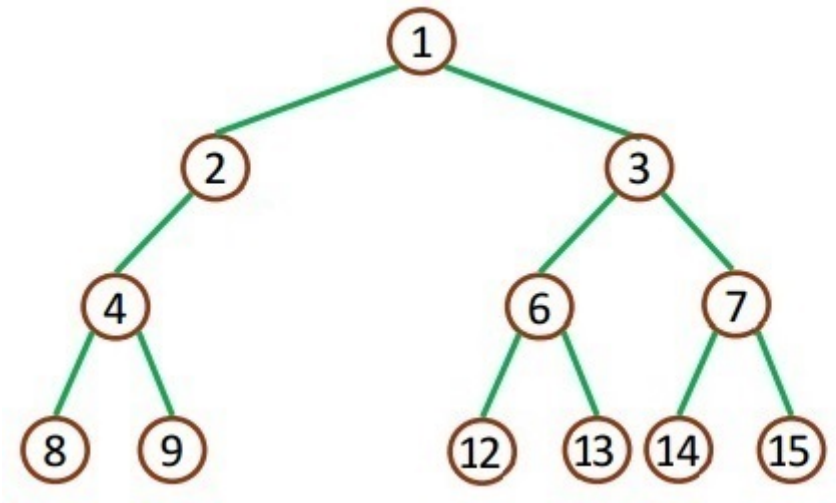
The Problem

A **family tree** is a chart representing family relationships in a conventional tree structure. In our case, we are only interested in our direct ancestors.

A common genealogical numbering system for listing a person's direct ancestors in a fixed sequence of ascent is as follows:

1. Subject
2. Father
3. Mother
4. Paternal grandfather
5. Paternal grandmother
6. Maternal grandfather
7. Maternal grandmother

and so on, back through the generations. Apart from number 1, who can be male or female, all even-numbered people are male, and all odd-numbered people are female. In this scheme, the number of any person's father is double the person's number, and a person's mother is double the person's number plus one. This system can be displayed as a tree:



Let's assume that the above tree has four levels.

When we build our family tree, it is common that we do not know some of our ancestors. And if we do not know an ancestor, we will assume that we will not know their ancestors either. In the above tree, the node 5 (and its ancestors) does not appear because we do not know who our paternal grandmother was.

In this problem, given the levels of the tree and the numbers of the unknown ancestors, you have to count the total number of people in the family tree.

The Input

The first line of the input contains an integer, *t*, indicating the number of test cases.

For each test case, there is a line with one number, n, indicating the number of levels in a family tree, where $2 \leq n \leq 20$. Then, there is a new line with one number, a, where $0 \leq a \leq 10$. Finally, there is another line with a numbers representing the unknown ancestors in this tree (there is no line if a is 0).

The Output

For each test case, the output should consist of one line showing the total amount of people in the family tree, preceded by the string "`People in the family tree: `". Observe in the samples that some of the unknown ancestors can be ancestors of other unknown ancestors.

Sample Input

```
4
2
0
5
3
2 4 2
10
5
16 8 32 4 2
10
2
2 3
```

Sample Output

```
People in the family tree: 3
People in the family tree: 16
People in the family tree: 512
People in the family tree: 1
```

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