Count Modulo 2

Input file:	`standard input`
Output file:	`standard output`
Time limit:	3.5 seconds
Memory limit:	1024 megabytes

You are given K distinct nonnegative integers $A_1, A_2, \cdots, A_K$. Count the number of sequences of N nonnegative integers $a_1, a_2, \cdots, a_N$ that satisfies all of the following conditions, modulo **2**.

- $a_1 + a_2 + \cdots + a_N = S$
- For each i $(1 \leq i \leq N)$, there exists an integer j such that $a_i = A_j$.

Note that there are T tests in one input file.

Input

Input is given from Standard Input in the following format:

T

Description of the 1-st test

Description of the 2-nd test

$\vdots$

Description of the T-th test

The description of each test is in the following format:

$N\ S\ K$

$A_1\ A_2\ \cdots\ A_K$

Constraints:

- $1 \leq T \leq 5$
- $1 \leq N \leq 10^{18}$
- $0 \leq S \leq 10^{18}$
- $1 \leq K \leq 200$
- $0 \leq A_1 < A_2 < \cdots < A_K \leq 10^5$
- All values in input are integers.

Output

For each test, print the count modulo 2.

Example

standard input	standard output
2 5 10 3 1 2 3 1000000000000000000 25453321771239381 10 0 1683 21728 31623 35054 37834 39329 56842 68603 74742	1 0

Note

In the first test, there are a total of 51 sequences that satisfy conditions.