# Problem L. Bit Sequence

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|---|---|
| Input file: | `standard input` |
| Output file: | `standard output` |
| Time limit: | 1 second |
| Memory limit: | 256 megabytes |

Let $f(x)$ denote the number of 1s in the binary representation of $x$.

Now MianKing has a sequence $a_{0...m-1}$ and he wants to know the number of integer $x \in [0, L]$ satisfies that: $\forall i \in [0, m-1], f(x+i)\ mod\ 2 = a_i$

You need to help him calculate the answer.

## Input

There are $T$ testcases in this problem.

The first line has one integer $T$.

Then for each testcase, the first line has two integer $m, L$. The second line has $m$ integers denote $a_{0...m-1}$

$1 \le T \le 1000$

$1 \le m \le 100$

$0 \le L \le 10^{18}$

$a_i \in \{0, 1\}$

## Output

For each testcase, output the answer in one line.

## Example

| standard input | standard output |
|---|---|
| 3<br>3 10<br>0 1 0<br>1 1000<br>0<br>9 1000000<br>1 0 1 1 0 1 0 0 1 | 2<br>501<br>41667 |