Task: KLU
Club members 2

XXVI OI, Stage I. Source file `klu.*` Available memory: 512 MB. *8.10 – 12.11.2018*

Let us revisit the Byteotian Discussion Club*. Recall that the club has 2^n members, and each has filled out a questionnaire with n fundamental Yes or No questions. Each member's answers can of course be encoded as a sequence of n bits, which yields an integer in the range from 0 to $2^n - 1$. We are ignoring the specifics of questions formulations or the mapping of Yes and No answers to 0 and 1. No two members have given the same answers, i.e., each number in the aforementioned range is present.

The club is holding a meeting today, attended by m members, who are sitting at a traditional *round* table. The long awaited Issue of Utmost Importance will finally be discussed today. In order to thoroughly prepare for the debate, the attending members have decided to form two teams, each of which will have its own initial discussion. To avoid commotion, each team is to consist of members sitting at successive chairs around the table. Moreover, for a well rounded balanced debate(s), each team should have a broad spectrum of opinions. In other words, for each of the n fundamental questions and the 2 possible answers to it, we require that if one team has a member who gave such answer, so does the other team.

Write a program that will determine the number of possible partitions of attending members into two teams.

Input

In the first line of the standard input, there are two integers n and m ($n \geq 2$, $m \geq 3$), which specify the number of fundamental questions and the number of attending members respectively. In the second line, there is a sequence of m pairwise different integers from the range of 0 to $2^n - 1$ that specify the complete answers to the fundamental questions of successive members at the round table.

Output

Exactly one integer should be printed to the standard output: the number of partitions of attending members into two teams that conform with aforementioned rules.

Example

For the input data:

```
4 5
1 10 0 11 3
```

the correct result is:

```
2
```

Explanation for the example: Two partitions are possible: 1 10 | 0 11 3 and 3 1 10 | 0 11.

Sample grading tests:

`1ocen:` $n = 5$, $m = 6$; the answers is 4;

`2ocen:` a small test with answer 0;

`3ocen:` $n = 20$, $m = 2^n$, members in ascending order; the result is large.

Grading

The set of tests consists of the following subsets. Within each subset, there may be several unit tests.

Subset	Property	Score
1	$n \leq 15$, $m \leq \min(2^n, 100)$	15
2	$n \leq 15$, $m \leq \min(2^n, 5000)$	20
3	$n \leq 30$, $m \leq \min(2^n, 100\,000)$	45
4	$n \leq 30$, $m \leq \min(2^n, 2\,000\,000)$	20

*We encountered this club in the *Club members* problem in XXIII OI.