Problem E
Modulo Completeness

Given an integer sequence $a_1, a_2, a_3, \cdots, a_n$, we divide these integers into two groups A and B. Let S_A and S_B be the sum of integers in A and B respectively. Given a positive integer k, consider the remainder r of $S_A - S_B$ divided by k with $0 \leq r < k$, where we denote that $r = (S_A - S_B) \mod k$. For all possible A and B, we can gather all the different resulted remainders r as R. We are interested in the size of R. If the size of R is k, then the sequence is called k-modulo complete.

For example, given an integer sequence $2, 1, 1$, we can enumerate all the possible A and B as follows.

$A = \{2, 1, 1\}, B = \{\}$, and $S_A - S_B = 4$.
$A = \{2, 1\}, B = \{1\}$, and $S_A - S_B = 2$.
$A = \{2\}, B = \{1, 1\}$, and $S_A - S_B = 0$.
$A = \{1, 1\}, B = \{2\}$, and $S_A - S_B = 0$.
$A = \{1\}, B = \{2, 1\}$, and $S_A - S_B = -2$.
$A = \{\}, B = \{2, 1, 1\}$, and $S_A - S_B = -4$.

If $k = 3$, we can get $R = \{(-4 \mod 3), (-2 \mod 3), (0 \mod 3), (2 \mod 3), (4 \mod 3)\} = \{0, 1, 2\}$ and its size is 3. If $k = 4$, we can get $R = \{(-4 \mod 4), (-2 \mod 4), (0 \mod 4), (2 \mod 4), (4 \mod 4)\} = \{0, 2\}$ and its size is 2. If $k = 5$, we can get $R = \{(-4 \mod 5), (-2 \mod 5), (0 \mod 5), (2 \mod 5), (4 \mod 5)\} = \{0, 1, 2, 3, 4\}$ and its size is 5.

Technical Specification

1. $0 < k < 10,000$
2. $0 < n < 600,000$
3. $\forall_{1 \leq i \leq n}$, $0 \leq a_i \leq k$

Input Format

The first line contains a number m ($m \leq 10$) indicating the number of test cases. For each test case, the first line has 2 numbers k and n. The following n lines contains n integers a_i.

Output Format

For each test case, please output the size of the diferent remander set R.

Sample Input

```
2
5 3
2 1 1
```

```
4 3
2 1 1
```

Sample Output for the Sample Input

```
5
2
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