Ball Sequence

Problem Code: **BALLSEQ**

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There is an infinite line of people, with person numbered $(i+1)$ standing on the right of person numbered i. Chef can do 2 types of operations to this line of people:

- Type 1: Give a ball to the person number 1.
  If there exists a person with two balls, they drop one ball and give the other ball to the person on their right, and this repeats until everyone has at most 1 ball.
- Type 2: Everyone gives their ball to the person on their left simultaneously.
  Since there is no one to the left of person 1, they would drop their original ball if they have one.

Chef gives a total of N instructions, out of which K instructions are of type 2. Each instruction is numbered from 1 to N. The indices of instructions of type 2 are given by the array $A_1, A_2, \ldots, A_K$. The rest operations are of type 1.

Find the number of balls that have been dropped by the end of all the instructions.

Input Format

- The first line of input will contain a single integer T, denoting the number of test cases.
- Each test case consists of multiple lines of input.
  - The first line of each test case contains two space-separated integers N and K — the total number of operations and number of operations of type 2.
  - The next line contains the array K space-separated integers $A_1, A_2, \ldots, A_K$ - the indices of instructions of type 2.

Output Format

For each test case, output on a new line the number of balls that have been dropped by the end of all the instructions.

Constraints

- $1 \leq T \leq 100$
- $1 \leq N \leq 10^9$
- $1 \leq K \leq 10^5$
- $1 \leq A_i \leq N$ for each $1 \leq i \leq M$
- $A_1 < A_2 < \cdots < A_K$
- The sum of K over all test cases won't exceed 10^5.

Sample Input 1

```
3
5 2
3 4
1 1
1
1000000000 5
271832455 357062697 396505195 580082912 736850926
```

Sample Output 1

```
2
0
999999980
```

Explanation

Test case 1: The operations are performed as follows:

- Type 1: Only person 1 has a ball. Till now, 0 balls dropped.
- Type 1: Person 1 has 2 balls. So he drops 1 ball and passes 1 to its right. Now, only person 2 has a ball. Till now, 1 ball dropped.
- Type 2: Person 2 passes the ball to its left. Now, only person 1 has a ball. Till now, 1 ball dropped.
- Type 2: Person 1 drops the ball. Till now, 2 balls dropped.
- Type 1: Only person 1 has a ball. Till now, 2 balls dropped.

In total, 2 balls are dropped.

Test case 2: Only one operation occurs which is of type 2, so no balls are dropped.

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Time Limit:	1 secs
Source Limit:	50000 Bytes
Languages:	CPP17, CPP14, PYTH 3, C, JAVA, PYP3, PYTH, CS2, NODEJS, GO, JS, TEXT, PHP, kotlin, RUBY, rust, PYPY, PAS fpc, HASK, SCALA, swift, PERL, SQLQ, D, LUA, BASH, LISP sbcl, ADA, R, TCL, SQL, PRLG, FORT, PAS gpc, FS, SCM qobi, CLPS, NICE, CLOJ, PERL6, CAML, SCM chicken, ICON, ICK, ST, WSPC, NEM, LISP clisp, COB, ERL, BF, ASM, PIKE, SCM guile

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