

Contest Duration: 2025-09-27(Sat) 22:00 (<http://www.timeanddate.com/worldclock/fixedtime.html?iso=20250927T2100&p1=248>) - 2025-09-27(Sat) 23:40 (<http://www.timeanddate.com/worldclock/fixedtime.html?iso=20250927T2240&p1=248>) (local time) (100 minutes)

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E - Count Sequences 2

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Time Limit: 2 sec / Memory Limit: 1024 MiB

Score : 450 points

Problem Statement

You are given a positive integer N and a sequence of positive integers $C = (C_1, C_2, \dots, C_N)$ of length N .

Find, modulo a given positive integer M , the number of sequences of positive integers that satisfy all of the following conditions.

- All elements of the sequence are between 1 and N , inclusive.
- For each $i = 1, 2, \dots, N$, the value i appears exactly C_i times in the sequence.

T test cases are given, so find the answer for each. M is common to all T test cases.

Constraints

- $1 \leq T \leq 10^5$
- $2 \leq M \leq 10^9$
- $1 \leq N$
- $1 \leq C_i$
- $\sum_{i=1}^N C_i \leq 5000$
- The sum of N over all test cases is at most 3×10^5 .
- All input values are integers.

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Input

The input is given from Standard Input in the following format:

```
T M
case1
case2
⋮
caseT
```

The i -th test case, case _{i} , is given in the following format:

```
N
C1 C2 ... CN
```

Output

Output T lines. The i -th line should contain the answer for the i -th test case.

Sample Input 1

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```
3 1000000000
2
2 2
5
1 1 1 1 1
6
1 2 3 4 5 6
```

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Sample Output 1

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```
6
120
230379200
```

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For the first test case, the sequences that satisfy the conditions are

(1, 1, 2, 2), (1, 2, 1, 2), (1, 2, 2, 1), (2, 1, 1, 2), (2, 1, 2, 1), (2, 2, 1, 1), which is six sequences.

Sample Input 2

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```
3 998244353
1
1
3
4 2 5
10
500 500 500 500 500 500 500 500 500 500
```

Sample Output 2

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```
1
6930
261233246
```

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