F - Not Adjacent

Editorial (/contests/abc427/tasks/abc427_f/editorial)

Time Limit: 4 sec / Memory Limit: 1024 MiB

Score : 525 points

Problem Statement

You are given a length-N integer sequence $A = (A_1, A_2, \ldots, A_N)$.

There are 2^N (not necessarily contiguous) subsequences of A. Find how many subsequences $(A_{i_1}, A_{i_2}, \ldots, A_{i_k})$ $(1 \leq i_1 < i_2 < \cdots < i_k \leq N)$ satisfy both of the following two conditions:

- The selected elements are not adjacent in A. That is, $1 + i_j \neq i_{j+1}$ holds for all $1 \leq j < k$.
- The sum is a multiple of M. That is, $\displaystyle\sum_{j=1}^{k} A_{i_j} \equiv 0 \pmod{M}$.

Even if two subsequences are equal as integer sequences, they are counted separately if the positions from which they are taken are different.

Constraints

- $1 \leq N \leq 60$
- $1 \leq M \leq 10^9$
- $0 \leq A_i < M$
- All input values are integers.

Input

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

$$N \quad M$$
$$A_1 \quad A_2 \quad \dots \quad A_N$$

Output

Print the answer.

Sample Input 1 Copy

```
7 6
3 1 4 1 5 3 2
```

Sample Output 1 Copy

```
6
```

The following six subsequences satisfy the conditions:

- $() = ()$
- $(A_1, A_3, A_5) = (3, 4, 5)$
- $(A_1, A_4, A_7) = (3, 1, 2)$
- $(A_1, A_6) = (3, 3)$
- $(A_2, A_5) = (1, 5)$
- $(A_3, A_7) = (4, 2)$

Thus, print 6.

Sample Input 2 Copy

```
15 10
5 5 5 5 5 5 5 5 5 5 5 5 5 5 5
```

Sample Output 2 Copy

```
798
```

Sample Input 3 Copy

```
20 998244353
778718481 719092922 676292280 713825156 0 434453766 620370916 67922064 0 577696866 21516
```

Sample Output 3 Copy

```
40
```

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