GCC '16 P2 - Classified Documents

Time limit: 1.0s **Memory limit:** 256M

The Secret Service have adopted a new communication system. This system uses *blocks* of varying length and type. **Each block can only contain a word with the exact same length as it.** Spaces and punctuation are ignored. Currently, the Secret Service has blocks of length up to and including N at their disposal. A *message* is composed of some number of blocks concatenated together. **The length of a message is the sum of the lengths of the blocks which compose the message.**

A message can contain a phrase if and only if a **contiguous subsequence** of blocks in that message has the **same lengths** as the words in the phrase and in the **same order**. For example, the message created by concatenating blocks of length $3, 2, 6, 7$ in that order can contain the phrase *Secret Service* but the message created by concatenating blocks of length $3, 2, 7, 6$ or $3, 6, 2, 7$ cannot.

Blocks may appear any number of times within a message. Two messages are considered distinct if they have a different number of blocks, or if the i^{th} block of one message has either a different length or different type from the other message $(1 \leq i \leq \text{number of blocks in each message})$.

The Secret Service currently has W operations which they communicate about using these messages. The i^{th} of these W operations is named n_i and is referred to as *Operation* n_i if it appears in a message. In addition to these W operations, there is always the possibility of an unnamed operation, which is dubbed *Anonymous Operation* if it appears in a message.

The Secret Service considers a message *classified* if it could contain the phrase *Operation* n_i $(1 \leq i \leq W)$ or *Anonymous Operation* in it. The head of the Secret Service has enlisted you to find out how many classified messages with a length of exactly L there are given the blocks at their disposal. Since this number may be very large, output it modulo $1\,000\,000\,007$ $(10^9 + 7)$.

Input Specification

The first line will contain two space separated integers N $(1 \leq N \leq 20)$ and L $(1 \leq L \leq 10^{18})$.
The next N lines will each contain one integer t_i $(1 \leq t_i \leq 10^6)$ which represents the number of types of blocks with length i that the Secret Service has.
The $N + 2^{th}$ line will contain one integer, W $(1 \leq W \leq 100)$.
The next W lines will each contain a single string, n_i $(1 \leq |n_i| \leq 20)$.

For 40% of points, $L \leq 10\,000$.

Output Specification

Output a single integer, the number of classified messages modulo $1\,000\,000\,007$ $(10^9 + 7)$.

Sample Input

```
20 38
0
0
0
0
0
0
0
0
1
1
0
0
0
0
0
0
0
0
0
1
1
Crossroads
```

Sample Output

```
8
```

Explanation for Sample Output

The 8 classified messages are formed by concatenating blocks of the following lengths in this order:

- $9, 9, 10, 10$
- $9, 10, 9, 10$
- $9, 10, 10, 9$
- $10, 9, 9, 10$
- $10, 9, 10, 9$
- $10, 10, 9, 9$
- $9, 9, 20$
- $20, 9, 9$