Task: PMM
Puzzle of the Perfect Meows

AACPP SuSe 2025 Round 8 Memory: 16MiB 2025.07.08 – 2025.07.15

Having tinkered with the keyboard before, Dexter the Cat got familiar with the symbols written on it. Following his owner typing away and mumbling to himself, starting to correspond some sounds to the letters, he decided to learn the alphabet too. Naturally, Dexter didn't know what that meant, but he was determined to figure it out in his own feline way.

Dexter had a collection of k favorite meows, each one slightly different in tone and pitch. He labeled these meows from A **to the k-th letter of the alphabet**, like "A", "B", "C", and so on. Each meow took a certain amount of energy to perform, and Dexter, being a very "efficient" cat, assigned an **energy cost** to each meow based on how much effort it took.

Now, Dexter wanted to create a **language of n unique meow sequences**. Each sequence was a combination of his favorite meows. But there was a catch: Dexter hated repeating himself, and he especially hated when one meow sequence started exactly like another. That would be so undignified, how would the owner know if Dexter spoke the shorter one, or if he was in the middle of the longer one but stopped mid-meowsence due to yet another suspiciously tasty sound that needed to be investigated right away. So he made a rule: "**No meow sequence can be the beginning of another.**"

In his infinite efficiency (laziness), Dexter wants to find the least tiring way to meow all these sequences. That means he needs to find the **minimum total energy** required to create n **such meow sequences** with the laid out rules using his **k favorite meows**.

Input

The first line of input contains two integers n and k, the number of unique meow sequences and the number of his favorite meows (number of assigned letters) respectively. The second line contains k positive integers, where the i-th integer is the energy cost w_i of the i-th meow.

Output

Print a single integer, equal to the total energy of the least tiring n-meow language over k of his favorite meows.

Example

For the input:

```
3 2
2 5
```

the correct output is:

```
16
```

We have assigned two letters, a and b, with costs $W(a) = 2$ and $W(b) = 5$ respectively. Energy of meow sequence ab is $W(ab) = 2 + 5 = 7$, energy of aba is $W(aba) = 2 + 5 + 2 = 9$. The cost of the language $W(\{ab, aba, b\}) = 7 + 9 + 5 = 21$. This language doesn't abide by the rules, as ab is a beginning of aba. The lightest three-sequence language over the set of 2 favorite meows has cost $W(\{b, aa, ab\}) = 16$.

Additional examples

The following initial tests are also available:

- `0b` – $n = 1\,000$, $k = 5$, all $w_i = 1$;
- `0c` – $n = 10\,000$, $k = 10$, $w_i = i$;
- `0d` – $n = 100\,000$, $k = 26$, $w_{2j-1} = 1$, $w_{2j} = 2$;

Limits

Your solution will be evaluated on a number of hidden test cases divided into groups. Points for a group are awarded if and only if the submission returns the correct answer for each of the tests in the group within the allotted time limit. These groups are organised into subtasks with the following limits and points awarded.

For all tests, $2 \leq k \leq 26$, $1 \leq w_i \leq 10\,000$.

Subtask	Limits	Points
1.	$1 \leq n \leq 1\,000$	2
2.	$1 \leq n \leq 10\,000$	3
3.	$1 \leq n \leq 100\,000$	5