

## Problem D

### Robot Upgrades

The Kingdom of ICPC is being attacked by evil balloons! Fortunately, Morgan the robot is ready to defend the kingdom. In order to strengthen his power, there are  $N$  parts, numbered from 1 to  $N$ , that can be upgraded. Each part can be upgraded 0 to  $M$  times (inclusive).

In order to save resources, there are  $M$  restrictions, numbered from 1 to  $M$ , in upgrading Morgan. For restriction  $i$ , the number of parts that are upgraded at least  $i$  times should not exceed  $A_i$ .

While planning on what upgrade should be applied to Morgan, Adrian wonders how many different upgrade configurations that satisfy all of the given restrictions. Two configurations are different if and only if there exists at least one part with a different number of upgrades applied to that part. Since the answer can be large, find the answer modulo 998 244 353.

#### Input

Input begins with two integers  $N$   $M$  ( $1 \leq N \leq 100\,000$ ;  $1 \leq M \leq 10$ ) representing the number of parts and the number of restrictions, respectively. The next line contains  $M$  integers  $A_i$  ( $1 \leq A_i \leq N$ ) representing the given restrictions. The integers in  $A$  are given in non-increasing order, i.e.  $A_1 \geq A_2 \geq \dots \geq A_M$ .

#### Output

Output an integer in a single line, representing the number of different upgrade configurations that satisfy all of the given restrictions modulo 998 244 353.

#### Sample Input #1

```
3 5
2 2 1 1 1
```

#### Sample Output #1

```
64
```

#### Explanation for the sample input/output #1

Denote  $(u_1, u_2, \dots, u_N)$  as an upgrade configuration such that part  $i$  is upgraded  $u_i$  times for all  $1 \leq i \leq N$ .

Some configurations that satisfy all restrictions are  $(0, 0, 0)$ ,  $(0, 0, 5)$ ,  $(2, 2, 0)$ ,  $(2, 0, 4)$ , and  $(0, 1, 0)$ . Some configurations that do not satisfy all restrictions are  $(1, 1, 1)$ ,  $(3, 0, 3)$ ,  $(5, 5, 5)$ ,  $(0, 5, 3)$ , and  $(2, 1, 4)$ .

#### Sample Input #2

```
1 2
1 1
```

### Sample Output #2

3

*Explanation for sample input/output #2*

All the upgrade configurations are to upgrade the only part 0, 1, or 2 times.

### Sample Input #3

16 8  
16 16 8 4 4 2 1 1

### Sample Output #3

720246211