Rank 2347 / 6373 (Score: 108.73) Server time: 02:55:06

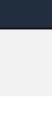






WORKSPACE / SUBMIT









## Scheduler Redux

Time limit: 1280 ms Memory limit: 264 MB

This is a harder version of the Scheduler problem.

Statement Submissions Questions

In this challenge you must figure out how quickly N jobs can be completed by M workers. Each job will take  $2^x$  amount of time, where x is a positive integer.

Since the amount of time could be quite large, you should indicate the amount of time needed modulo  $10^9 + 7$ .

In this harder version of the problem, two jobs CAN have the same time to finish.

## Standard input

Each input has a single test case.

The input begins with a line containing two space-separated integers, N and M. N specifies the number of jobs, and M specifies the number of workers.

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The next line of input contains N integers, where the  $i^{th}$  integer,  $X_i$ , indicates that job i takes  $2^{X_i}$  time.

## Standard output

Output the minimum amount of time required to complete all of the jobs, modulo  $10^9 + 7$ .

## Constraints and notes

- $1 \le N \le 100,000$
- $1 \le M \le 20$

5 2

•  $0 \le X_i \le 100,000$ 

9998 9998 9999 10000

Input	Output	Explanation
5 2 1 1 2 2 2	8	The job times are 2, 2, 4, 4, and 4, respectively.  One of the strategies is to give jobs 1, 2, and 3 to worker 1, and job 4 and 5 to worker 2.  The total time for worker 1 is 8 (from 2 + 2 + 4). The total time for worker 2
3 1 1 2 2	10	is also 8 (from 4 + 4). Thus, the time needed is 8.