The Subset

Time limit: 1.0s **Memory limit:** 512M

Given the first N positive integers, there are $2^N - 1$ non-empty subsets. Bob wants to choose M distinct subsets from them so that each integer in the union of the M subsets occurred an even number of times. For example, if $N = 3$ and $M = 3$, there are 7 non-empty subsets. Bob can choose the subsets $\{1\}$, $\{2\}$, and $\{1, 2\}$, where every integer has an even number of occurences. Can you help Bob to find the number of different ways to choose the M subsets? Since the answer is huge, ouptut the answer modulo $10^9 + 7$.

Input Specification

The first line of input contains two integers N and M ($N, M \leq 10^6$).

Output Specification

Output one integer, the number of ways to choose subsets.

Constraints

Subtask	Points	Additional constraints
1	20	$N, M \leq 5$.
2	30	$N, M \leq 3\,000$.
3	50	No additional constraints.

Sample Input 1

```
3 3
```

Sample Output 1

```
7
```

Explanation

There are 7 ways to choose 3 subsets, listed as following:

- $\{1\}, \{2\}, \{1, 2\}$
- $\{1\}, \{3\}, \{1, 3\}$
- $\{2\}, \{3\}, \{2, 3\}$
- $\{1\}, \{2, 3\}, \{1, 2, 3\}$
- $\{2\}, \{1, 3\}, \{1, 2, 3\}$
- $\{3\}, \{1, 2\}, \{1, 2, 3\}$
- $\{1, 2\}, \{2, 3\}, \{1, 3\}$

Sample Input 2

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5 3
```

Sample Output 2

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155
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