

Classroom Carnival Chaos

Every year, Chikapu’s school organizes a Carnival in March to help students chill before their final exams.

This year, Chikapu is in charge of the Carnival’s parade. There are n classes, each sending exactly m students to participate in the parade. During the parade, the students are arranged in an n -row by m -column grid. The cell on the i -th row and j -th column is denoted by (i, j) . Each cell in the grid has exactly one student. To promote diversity, Chikapu wants to ensure that no two students from the same class occupy the same column.

Now Chikapu wonders, how many different arrangements are possible? Two arrangements are considered different, if there is at least one cell occupied by different students.

As the number of arrangements be very large, output it modulo $(10^9 + 7)$.

Input

The first line contains a single integer t ($1 \leq t \leq 10^5$) – the number of test cases. t test cases follow, each consists of two integers n and m in one line ($1 \leq n, m \leq 10^7$).

Output

For each test case, print the answer in one line.

Sample Input 1

```
1
2 2
```

Sample Output 1

```
16
```

Sample Explanation

In the sample test case, there are 2 classes, each with 2 students. Let the classes be **A** and **B**. And let’s denote the students in class **A** by **A1** and **A2**, and the students in class **B** with **B1** and **B2**.

There are **16** valid arrangements, as shown below:

B2 A2 A1 B1	B1 A2 A1 B2	B1 B2 A2 A1	A2 B2 B1 A1
A2 B1 B2 A1	A1 A2 B1 B2	A2 A1 B1 B2	A1 A2 B2 B1
B2 B1 A2 A1	A1 B1 B2 A2	B1 B2 A1 A2	B2 B1 A1 A2
B1 A1 A2 B2	A2 A1 B2 B1	B2 A1 A2 B1	A1 B2 B1 A2

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