

## 7642 Prime Distance

You have an empty  $1 \times n$  grid. The cells of the grid are indexed from 1 to  $n$  from left to right. You have to put  $m$  identical coins in the grid. A cell can contain zero or more coins. If you pick a pair of cells each containing at least one coin, the distance between the cells must be a prime number.

How many ways you can place the coins? As the number can be large, find answer modulo  $10^9 + 7$ . Two ways are different if there is at least one cell which contains different number of coins.

The distance between two cells indexed  $i, j$  is  $|i - j|$ .

### Input

The first line contains  $T$  ( $1 \leq T \leq 2000$ ) (the number of test cases). Each of the next  $T$  lines contains two integers  $n$  ( $1 \leq n \leq 10^5$ ) and  $m$  ( $1 \leq m \leq 10^5$ ) separated by a single space.

### Output

For each case, print the case number and the answer *modulo*  $10^9 + 7$ .

### Hint:

In the first case, you can put both coins in cell 1, 2 or 3. Or you can put a coin in cell 1 and put another coin in cell 3. See picture.

Note that in the 2nd case putting 3 coins in cell 1, 3, 5, is not valid, because the distance between cell 5 and cell 1 is a non-prime.

### Sample Input

```
2
3 2
6 3
```

### Sample Output

```
Case 1: 4
Case 2: 24
```

