G. John's Tree

Score: 1  
  
CPU: 1s  
Memory: 1024MB

Little John is very interested about constructing a rooted tree with the following constraints:

1. A tree of depth D means that the tree should contain at least 1 node which is exactly D distance away from the root and there is no node of more than D distance from the root.
2. The degree of a node of the tree cannot be greater than V. Degree of a node is simply measured by the number of nodes it is directly connected to, via a single edge.

John wonders about the maximum number of nodes in a tree following the rules described above. For example, if D = 1 and V = 2, then the maximum number of nodes in the tree is 3.

Input

First line of the input contains a positive integer T (T ≤ 150). Each of the following T lines contains two integers D (0 ≤ D ≤ 2 \* 10^9) and V (1 ≤ V ≤ 2 \* 10^9), respectively.

Output

For each case, print a line of the form Case <x>: <y>, where x is the case number and y is the maximum possible number of nodes in the tree. As the value of y can be quite large, print the value modulo 1000000007 (10^9 + 7). If it is not possible to construct the tree, print Case <x>: -1.

Sample

| **Input** | **Output** |
| --- | --- |
| 3  0 1  1 2  1 5 | Case 1: 1  Case 2: 3  Case 3: 6 |