Problem G. Recover the String

Input file:	`standard input`
Output file:	`standard output`
Time limit:	8 seconds
Memory limit:	1024 megabytes

There is a string s consisting of lowercase English letters. Little Cyan Fish is fond of this string, so he noted down all its unique substrings and added directed edges between them. Specifically, for two distinct substrings s_1 and s_2, if there is a letter c such that $s_2 = s_1 + c$ or $s_2 = c + s_1$, he drew a directed edge from s_1 to s_2. Afterward, he removed all the duplicated edges. As a result, this forms a Directed Acyclic Graph (DAG).

Unfortunately, Little Cyan Fish has forgotten the original string s. Even worse, he also can't remember which substring corresponds to each node in the DAG. Now that he only has the DAG, your task is to help Little Cyan Fish recover the original string s. Since there could be multiple possible solutions, Little Cyan Fish is only interested in the one with the smallest lexicographical order.

Input

There are multiple test cases. The first line contains one integer T ($1 \le T \le 10^5$), representing the number of test cases.

For each test case, the first line of the input contains two integers n, m ($1 \le n \le 10^6, 0 \le m \le 2 \times 10^6$), representing the number of nodes and edges.

The i-th of the next m lines contains two integers u_i, v_i ($1 \le u_i, v_i \le n$), representing a directed edge from u_i to v_i. It is guaranteed that at least one valid solution exists.

It is guaranteed that the sum of n over all test cases does not exceed 10^6, and the sum of m over all test cases does not exceed 2×10^6.

Output

For each test case, output a single line contains a string consists of lowercase English letters, representing the answer.

Example

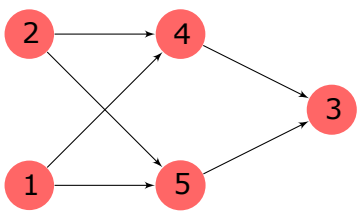
standard input	standard output
3 1 0 5 6 2 4 2 5 5 3 4 3 1 5 1 4 8 11 1 2 1 4 1 6 2 5 3 4 3 6 4 5 4 7 5 8 6 7 7 8	a aba aaba

Note

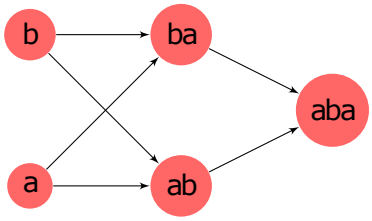
The DAG corresponding to the first sample test case is as follows.

The string corresponding to each node is as follows.

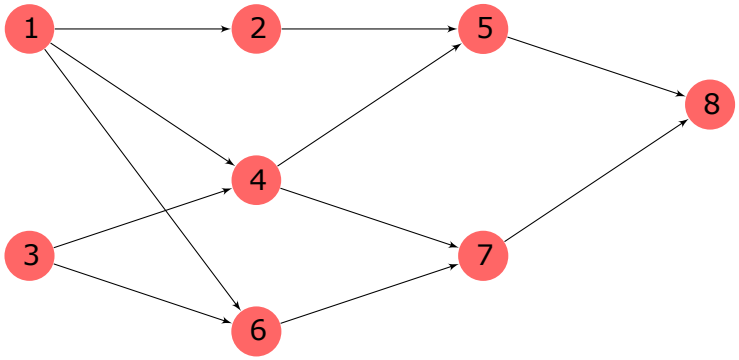
The DAG corresponding to the second sample test case is as follows.



The string corresponding to each node is as follows.



The DAG corresponding to the third sample test case is as follows.



The string corresponding to each node is as follows.