Problem G. Beautiful Automata

Input file:	*standard input*
Output file:	*standard output*
Time limit:	2 seconds
Memory limit:	512 mebibytes

Oleksandr is a fan of strings. His favourite data structure is suffix automaton.

Consider a string s of lowercase English letters. The suffix automaton of s is the smallest (having the smallest number of vertices) directed acyclic graph G with a letter $l(e)$ written on each edge e and a fixed starting vertex v_0 such that

$$\{w \mid w \text{ is a substring of } s\} = \{l(e_1)l(e_2)...l(e_k) \mid (e_1, e_2, ..., e_k) \text{ is a path in } G \text{ starting at } v_0\}.$$

Oleksandr likes suffix automata more than any other graphs. He calls a directed acyclic graph G *s-beautiful* if it is possible to write a lowercase English letter on each edge and choose a starting vertex v_0 so that G will become a suffix automaton of the string s. Oleksandr likes lexicographically small strings, so please help him find for a given graph G the lexicographically smallest string s such that G is s-beautiful.

Input

The first line contains two integers n and m ($1 \le n \le 2000$, $1 \le m \le 3000$), the number of vertices and the number of edges in G respectively. Each of the next m lines contains two integers v and u ($1 \le v, u \le n$, $v \ne u$), denoting a directed edge from v to u. It is guaranteed that G is acyclic.

Output

Output a single line containing the lexicographically smallest string s consisting of lowercase English letters such that G is s-beautiful. If such string does not exist, output -1.

Examples

standard input	standard output
2 1 1 2	a
4 5 1 2 2 3 1 4 2 4 3 4	aab
5 5 1 2 1 3 2 3 3 4 4 5	abab
4 5 1 2 1 3 1 4 2 3 4 3	-1

Explanations

Suffix automata for the first three sample tests are shown below: