

Problem M. Stage Clear

Input file: **standard input**
 Output file: **standard output**
 Time limit: 7 seconds
 Memory limit: 1024 megabytes

Prof.Chen likes playing computer game very much. He is now fighting against scary monsters in the game. The battlefield consists of n intersections, labeled by $1, 2, \dots, n$. There are m directed arcs between these intersections, such that the battlefield can be regarded as a directed acyclic graph. The player is now at intersection 1 and has X health points (HP).

There is a monster at each intersection except intersection 1. When the player moves to an intersection for the first time, he must fight the monster at that intersection. During the fight, he will lose a_i HP. And when he finally beats the monster, he will be awarded b_i HP. Note that when HP becomes negative (< 0), the game will end, so never let this happen. If the player visits the same intersection more than once, the fight happens only on the first visit, as monsters do not have an extra life. The player can only move along the given m directed arcs, or fly to the intersection 1 by magic. The player can fly for multiple times, and it is always possible for him to reach every intersection.

When all monsters are cleared, Prof.Chen will pass the stage. Please write a program to compute the minimum initial HP to clear the stage.

Input

The first line of the input contains two integers n and m ($n + m \leq 72$, $n \geq 2$, $m \geq n - 1$), denoting the number of intersections and the number of directed arcs.

Each of the next $n - 1$ lines contains two integers a_i and b_i ($1 \leq a_i, b_i \leq 10^{15}$), describing monsters at intersections $2, 3, \dots, n$.

Each of the next m lines contains two integers u_i and v_i ($1 \leq u_i < v_i \leq n$), denoting a directed arc from intersection u_i to intersection v_i . There will be at most one arc between a pair of intersections.

It is guaranteed that the player can reach every intersection from the intersection 1.

Output

Print a single line containing an integer, denoting the minimum initial HP required to clear the stage.

Example

standard input	standard output
4 4	4
4 2	
5 3	
2 6	
1 2	
1 3	
2 4	
3 4	