Jewel Game

Input file:	`standard input`
Output file:	`standard output`
Time limit:	3 seconds
Memory limit:	1024 megabytes

You are given a directed graph with N vertices and M edges. The vertices are numbered from 1 to N, and the edges are numbered from 1 to M. Edge i ($1 \leq i \leq M$) goes from vertex U_i to vertex V_i. The graph may have self-loops, but there are no multiple edges. It is guaranteed that there is at least one edge going out from each vertex.

There are K jewels placed on some of the vertices. The i-th ($1 \leq i \leq K$) jewel is located at vertex X_i and has value W_i.

Alice and Bob are playing a game using this graph. At the beginning of the game, Alice is at vertex A, and Bob is at vertex B. Starting with Alice, Alice and Bob take turns performing the following action:

- Choose one edge going out from the vertex they are currently on and move to the next vertex along that edge. If the next vertex has a jewel, they take the jewel and remove it from the graph.

The game ends when either all jewels are taken, or the current state of the game (turn, positions of both players, remaining jewels) has appeared before. At the end of the game, the score of the game is defined as:

(the sum of the values of the gems taken by Alice) − (the sum of the values of the gems taken by Bob)

Alice wants to maximize this score, while Bob wants to minimize it. Find the score of the game when both players play optimally.

Input

The input is given from Standard Input in the following format:

$$
\begin{array}{l}
N\ M\ A\ B \\
U_1\ V_1 \\
\vdots \\
U_M\ V_M \\
K \\
X_1\ W_1 \\
\vdots \\
X_K\ W_K
\end{array}
$$

- All values in the input are integers.
- $2 \leq N \leq 30$
- $1 \leq A, B \leq N$
- $1 \leq U_i, V_i \leq N$ $(1 \leq i \leq M)$
- $(U_i, V_i) \neq (U_j, V_j)$ $(1 \leq i < j \leq M)$
- For every x $(1 \leq x \leq N)$, there exists at least one i such that $U_i = x$.
- $1 \leq K \leq 10$
- $1 \leq X_1 < \cdots < X_K \leq N$

- $X_i \notin \{A, B\}$ $(1 \leq i \leq K)$
- $1 \leq W_i \leq 10^8$ $(1 \leq i \leq K)$

Output

Print the score of the game when both players play optimally.

Examples

standard input	standard output
5 16 1 1 1 2 1 3 1 4 1 5 2 3 2 4 2 5 3 2 3 4 3 5 4 2 4 3 4 5 5 2 5 3 5 4 4 2 4 3 84 4 38 5 96	46
8 16 8 4 1 2 2 3 3 4 4 5 5 6 6 7 7 8 8 1 1 5 2 6 3 7 4 8 5 1 6 2 7 3 8 4 6 1 29 2 34 3 41 5 7 6 26 7 94	-23