A - One Card Poker

Time Limit: 2 sec / Memory Limit: 256 MiB

Score : 100 points

Problem Statement

Alice and Bob are playing *One Card Poker*.
One Card Poker is a two-player game using playing cards.

Each card in this game shows an integer between `1` and `13`, inclusive.
The *strength* of a card is determined by the number written on it, as follows:

Weak `2` $<$ `3` $<$ `4` $<$ `5` $<$ `6` $<$ `7` $<$ `8` $<$ `9` $<$ `10` $<$ `11` $<$ `12` $<$ `13` $<$ `1` Strong

One Card Poker is played as follows:

1. Each player picks one card from the deck. The chosen card becomes the player's hand.
2. The players reveal their hands to each other. The player with the stronger card wins the game.
   If their cards are equally strong, the game is drawn.

You are watching Alice and Bob playing the game, and can see their hands.
The number written on Alice's card is A, and the number written on Bob's card is B.
Write a program to determine the outcome of the game.

Constraints

- $1 \leqq A \leqq 13$
- $1 \leqq B \leqq 13$
- A and B are integers.

Input

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

A B

Output

Print `Alice` if Alice will win. Print `Bob` if Bob will win. Print `Draw` if the game will be drawn.

Sample Input 1 Copy

```
8 6
```

Sample Output 1 Copy

```
Alice
```

`8` is written on Alice's card, and `6` is written on Bob's card. Alice has the stronger card, and thus the output should be `Alice`.

Sample Input 2 Copy

```
1 1
```

Sample Output 2 Copy

```
Draw
```

Since their cards have the same number, the game will be drawn.

Sample Input 3 Copy

```
13 1
```

Sample Output 3 Copy

```
Bob
```

B - Template Matching

Time Limit: 2 sec / Memory Limit: 256 MiB

Score : 200 points

Problem Statement

You are given an image A composed of N rows and N columns of pixels, and a template image B composed of M rows and M columns of pixels.
A pixel is the smallest element of an image, and in this problem it is a square of size 1×1.
Also, the given images are binary images, and the color of each pixel is either white or black.

In the input, every pixel is represented by a character: `.` corresponds to a white pixel, and `#` corresponds to a black pixel.
The image A is given as N strings $A_1, \ldots, A_N$.
The j-th character in the string A_i corresponds to the pixel at the i-th row and j-th column of the image A $(1 \leqq i, j \leqq N)$.
Similarly, the template image B is given as M strings $B_1, \ldots, B_M$.
The j-th character in the string B_i corresponds to the pixel at the i-th row and j-th column of the template image B $(1 \leqq i, j \leqq M)$.

Determine whether the template image B is contained in the image A when only parallel shifts can be applied to the images.

Constraints

- $1 \leqq M \leqq N \leqq 50$
- A_i is a string of length N consisting of `#` and `.`.
- B_i is a string of length M consisting of `#` and `.`.

Input

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

```
N M
A_1
A_2
:
A_N
B_1
B_2
:
B_M
```

Output

Print `Yes` if the template image B is contained in the image A. Print `No` otherwise.

Sample Input 1 Copy

```
3 2
#.#
.#.
#.#
#.
.#
```

Sample Output 1 Copy

```
Yes
```

The template image B is identical to the upper-left 2×2 subimage and the lower-right 2×2 subimage of A. Thus, the output should be `Yes`.

Sample Input 2 Copy

```
4 1
....
....
....
....
#
```

Sample Output 2 Copy

```
No
```

The template image B, composed of a black pixel, is not contained in the image A composed of white pixels.

C - One-stroke Path

Time Limit: 2 sec / Memory Limit: 256 MiB

Score : 300 points

Problem Statement

You are given an undirected unweighted graph with N vertices and M edges that contains neither self-loops nor double edges.

Here, a *self-loop* is an edge where $a_i = b_i (1 \leq i \leq M)$, and *double edges* are two edges where $(a_i, b_i) = (a_j, b_j)$ or $(a_i, b_i) = (b_j, a_j) (1 \leq i < j \leq M)$.

How many different paths start from vertex 1 and visit all the vertices exactly once?

Here, the endpoints of a path are considered visited.

For example, let us assume that the following undirected graph shown in Figure 1 is given.

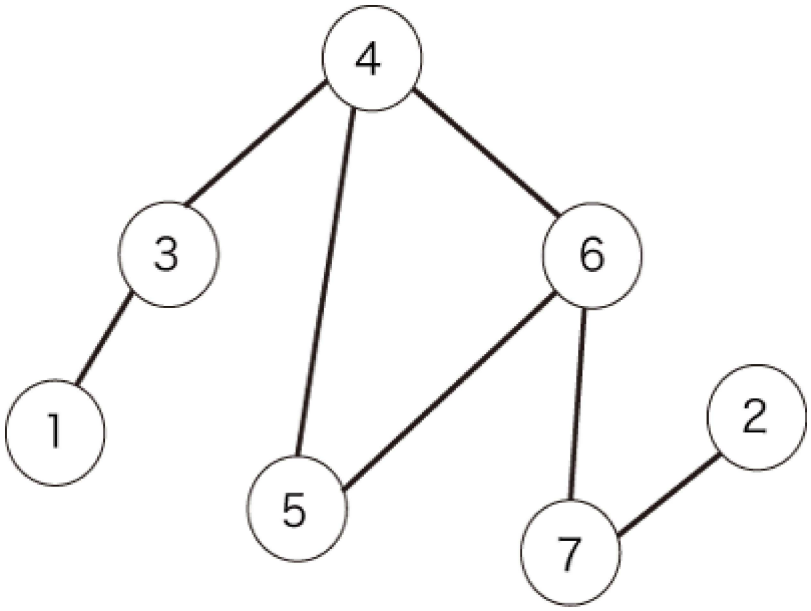


Figure 1: an example of an undirected graph

The following path shown in Figure 2 satisfies the condition.

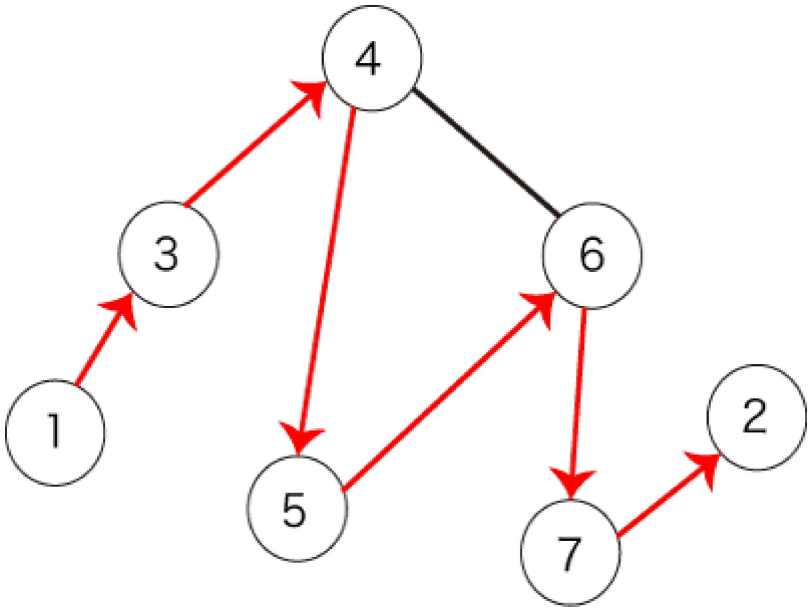


Figure 2: an example of a path that satisfies the condition

However, the following path shown in Figure 3 does not satisfy the condition, because it does not visit all the vertices.

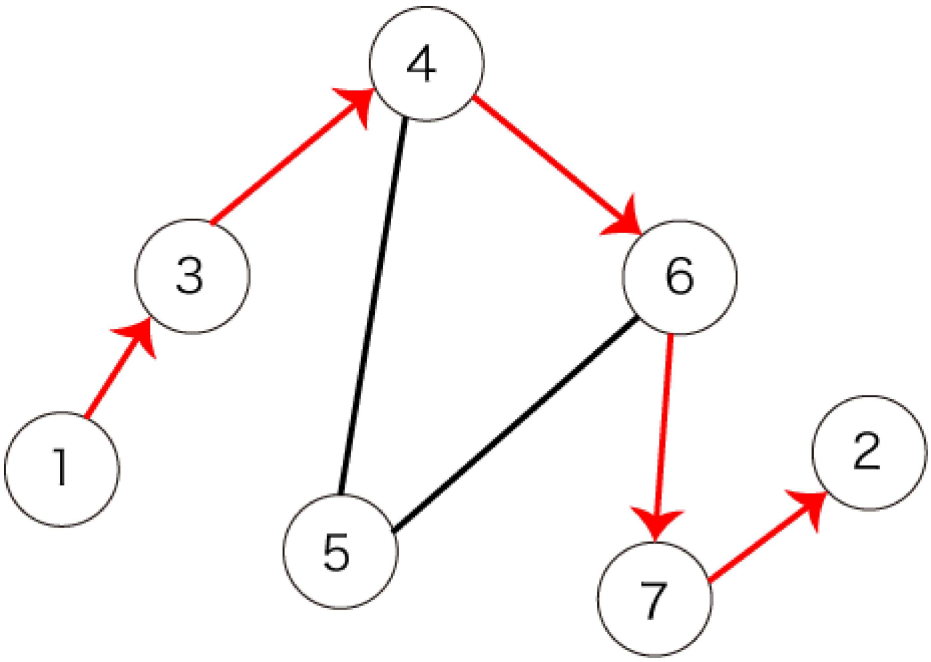


Figure 3: an example of a path that does not satisfy the condition

Neither the following path shown in Figure 4, because it does not start from vertex 1.

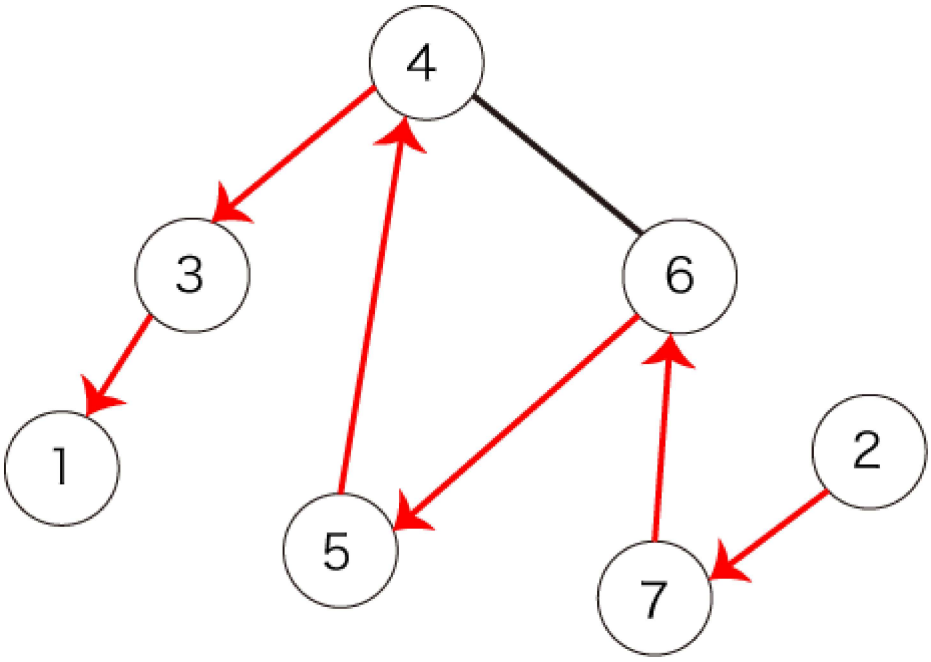


Figure 4: another example of a path that does not satisfy the condition

Constraints

- $2 \leqq N \leqq 8$
- $0 \leqq M \leqq N(N-1)/2$
- $1 \leqq a_i < b_i \leqq N$
- The given graph contains neither self-loops nor double edges.

Input

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

$$
\begin{array}{ll}
N & M \\
a_1 & b_1 \\
a_2 & b_2 \\
: & \\
a_M & b_M
\end{array}
$$

Output

Print the number of the different paths that start from vertex 1 and visit all the vertices exactly once.

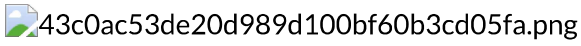
Sample Input 1 Copy

```
3 3
1 2
1 3
2 3
```

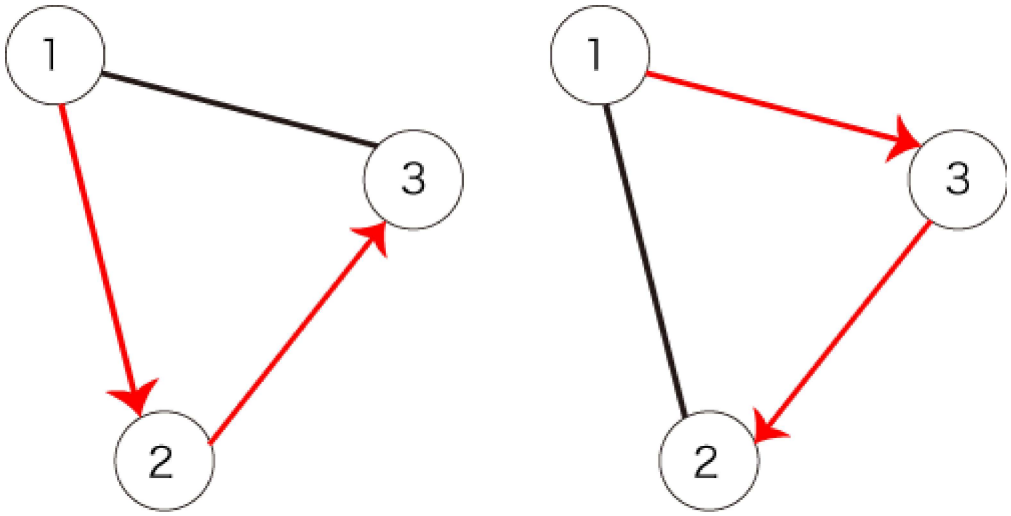
Sample Output 1 Copy

```
2
```

The given graph is shown in the following figure:



The following two paths satisfy the condition:



Sample Input 2 Copy

```
7 7
1 3
2 7
3 4
4 5
4 6
5 6
6 7
```

Sample Output 2 Copy

```
1
```

This test case is the same as the one described in the problem statement.

D - Mixing Experiment

Time Limit: 2 sec / Memory Limit: 256 MiB

Score : 400 points

Problem Statement

Dolphin is planning to generate a small amount of a certain chemical substance C.
In order to generate the substance C, he must prepare a solution which is a mixture of two substances A and B in the ratio of $M_a : M_b$.
He does not have any stock of chemicals, however, so he will purchase some chemicals at a local pharmacy.
The pharmacy sells N kinds of chemicals. For each kind of chemical, there is exactly one package of that chemical in stock.
The package of chemical i contains a_i grams of the substance A and b_i grams of the substance B, and is sold for c_i yen (the currency of Japan).
Dolphin will purchase some of these packages. For some reason, he must use all contents of the purchased packages to generate the substance C.
Find the minimum amount of money required to generate the substance C.
If it is not possible to generate the substance C by purchasing any combination of packages at the pharmacy, report that fact.

Constraints

- $1 \leqq N \leqq 40$
- $1 \leqq a_i, b_i \leqq 10$
- $1 \leqq c_i \leqq 100$
- $1 \leqq M_a, M_b \leqq 10$
- $gcd(M_a, M_b) = 1$
- a_i, b_i, c_i, M_a and M_b are integers.

Input

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

$$
\begin{array}{lll}
N & M_a & M_b \\
a_1 & b_1 & c_1 \\
a_2 & b_2 & c_2 \\
: & & \\
a_N & b_N & c_N
\end{array}
$$

Output

Print the minimum amount of money required to generate the substance C. If it is not possible to generate the substance C, print `-1` instead.

Sample Input 1 Copy

```
3 1 1
1 2 1
2 1 2
3 3 10
```

Sample Output 1 Copy

```
3
```

The amount of money spent will be minimized by purchasing the packages of chemicals 1 and 2.
In this case, the mixture of the purchased chemicals will contain 3 grams of the substance A and 3 grams of the substance B, which are in the desired ratio: $3 : 3 = 1 : 1$.
The total price of these packages is 3 yen.

Sample Input 2 Copy

```
1 1 10
10 10 10
```

Sample Output 2 Copy

```
-1
```

The ratio $1:10$ of the two substances A and B cannot be satisfied by purchasing any combination of the packages. Thus, the output should be `-1`.