Task Alias

Novak and Rafael are playing a simplified version of the game Alias. Novak needs to make Rafael guess a word without saying it. Rafael has a database of n words in his head, and there are m connections between some words. The connection between words x and y, with time t, means that if Rafael remembers the word x or hears it, after t milliseconds he will remember the word y.

Novak and Rafael will play q rounds. In each round, Novak wants to know: if he says the word a, after how many milliseconds will Rafael remember the word b for the first time? The rounds are independent.

Input

The first line contains integers n ($2 \leq n \leq 1000$) and m ($1 \leq m \leq 1000$), the number of words and the number of connections.

Each of the following m lines contains two different words x_i and y_i, and an integer t_i ($1 \leq t_i \leq 10^9$), that describe a connection. The words consist of at most 20 lowercase letters. All words from Rafael's database will appear at least once. It is possible that there are multiple connections between some pairs of words.

The following line contains an integer q ($1 \leq q \leq 1000$), the number of rounds.

Each of the following q lines contains two different words a_i and b_i, the word that Novak will say and the word that Rafael needs to remember in the i-th round. Both words appear in Rafael's database.

Output

Output q lines. In the i-th line output the time for the i-th round in milliseconds, or `Roger` if Rafael will never remember the word.

Scoring

In test cases worth 20 points, it holds $1 \leq n \leq 10$.
In test cases worth additional 20 points, it holds $1 \leq n \leq 100$.

Examples

input	input	input
3 2 novak goat 1 goat simulator 3 2 novak simulator simulator goat	3 3 kile legend 4 legend beer 5 beer kile 6 2 kile beer legend kile	4 5 rafael me 5 me ow 6 ow ausopenfinal 2012 ausopenfinal me 2 rafael ausopenfinal 2 3 rafael me me rafael ow me
output	**output**	**output**
4 Roger	9 11	4 Roger 2014

Clarification of the first example:

In the first round, Novak will say the word `novak`. After 1 millisecond, Rafael will remember the word `goat`, and after 3 more milliseconds the required word `simulator`. In the second round, Novak will say the word `simulator`, but Rafael won't remember any other words.