# Safe Transmit

## Description

The Administrator of the computers room in Huade College decides to using some safe protocols, the safe-level of them are defined as A, B, C(A > B, B > C). These protocols are working for the communication between different computers.

There are N computers in the LAN, and they can communicate with each other.

Now the Administrator wants to know that if he send message from computer-a to computer-b, what is the safe-level of this communication, the message can be retransmitted by other computers. The safe-level of a communication can define as : there is more than one road from computer-a to computer-b directly or indirectly, every road are made up by some segments, and each segment is a communication from computer-a to computer-b directly, each segment will use a protocol and the safe-level of the segment is the protocol’s safe-level, then we can define the safe-level of a road is the minimum safe-level of all segments in the road, and the safe-level of a communication is the maximum of all the road. For example, the protocol from computer-a to computer-b is level C, the protocol from computer-a to computer-c is level A, the protocol from computer-c to computer-b is level B ,then the safe-level of the communication from computer-a to computer-b is level B.( road 1:a->b ,the level is C; road 2: a->c->b ,the level is B=minimum {A,B} )

## Input

There are many test cases. each block of test case is begin with an integer N (2<=N<=500, the computers are numbered from 1 to N), indicates the number of computers in the LAN, in the second line there is an integer M, indicates how many pairs of computers are using safe protocols. From 3 line to M+2 line, each line contains two integers a, b and one character c (c belongs in {'A','B','C'}), means the safe-level of the protocol between computer-a and computer-b directly is level c. The M+3 line is an integer P (1<=P<=N^2), indicates the times that the Administrator will send messages and he want know the safe-level. From M+4 line to M+3+P line ,each line contains two integers d, e ,indicate the Administrator will send a message from computer-d to computer-e.( d not equals e)

## Output

For each test case, you should output the safe-level of each communication that the Administrator sends messages. Different test cases will be separated by a blank line.

## Sample Input

4

4

1 2 A

1 3 A

1 4 B

2 3 C

4

2 3

2 4

3 4

4 1

5

5

1 2 A

1 2 B

2 3 B

3 4 C

2 4 C

6

1 2

2 3

2 4

1 3

4 1

1 5

## Sample Output

A

B

B

B

A

B

C

B

C

D

## HINT

The default safe-level in the LAN is D.