Problem A. Connectivity

Input file:	*standard input*
Output file:	*standard output*
Time limit:	12 seconds
Memory limit:	256 mebibytes

There are n cities in Byteotia. Nowadays, the country has no highways. However, the Byteotian government planned that in the subsequent years, a network of m highways will be gradually built. Each of the planned highways will be bidirectional and will be of one of d types, numbered 1 through d.

Fix some point of time in the future. We say that an ordered pair of cities (a, b) is *well-connected* if $a = b$ or the following condition holds: for all types $t = 1, \ldots, d$, one can travel from a to b using only highways of type t.

You are given the order in which the planned highways will be built. Your task is to compute, for all $k = 1, \ldots, m$, the number of pairs of cities that will be well-connected after k first highways are built.

Input

The first line of the input contains three integers d, n, m ($1 \le d \le 200$, $1 \le n \le 5000$, $1 \le m \le 1\,000\,000$), denoting the number of types of highways, the number of cities and the number of planned highways. The cities are numbered 1 through n. The following m lines describe the planned highways. The i-th of these lines contains three integers a_i, b_i, k_i ($1 \le a_i, b_i \le n$, $a_i \ne b_i$, $1 \le k_i \le d$), denoting that the i-th highway will run between a_i and b_i and will be of type k_i.

Output

You should output exactly m lines. The k-th of these lines should contain a single integer – the number of (ordered) pairs of cities that are well-connected after the first k highways are built.

Example

standard input	standard output
3 4 10 1 2 1 2 1 2 1 2 3 3 4 1 1 3 2 2 3 3 2 4 2 3 4 3 3 4 2 1 3 1	4 4 6 6 6 6 6 8 8 16