A cut is a partition of the vertices of a graph into two disjoint subsets. Any cut creates a cut-set, the set of edges that have one endpoint in each subset of the partition. Let $V(cut-set)$ denote the XOR of all the weights on all the edges in the cut-set. In this problem you will start with an empty graph with n nodes. A number of weighted edges will be successively added to the graph. After the addition of each weighted edge, output the value of the maximum XOR cut, such that $V(cut-set)$ is maximized!

Input

A number of of inputs (≤ 100) with the following format:

The first two integers n, m represent the number of points in the graph and the total number of edges to be added successively. Next, we have m lines, with x, y, w where (x, y) is the undirected edge of weight w. w will be given in binary form listed from the highest binary bit to lowest binary bit.

Note that $1 \leq n \leq 500$, $1 \leq m \leq 1000$, $0 \leq length(w) \leq 1000$, $1 \leq x, y \leq n$.

Output

For each edge, output the value of the maximum XOR cut in binary form (from high bit to low bit).

Sample Input

```
3 6
1 2 11
1 2 11
3 3 1110
1 3 1011011
1 2 10111
2 3 1110110
```

Sample Output

```
11
0
0
1011011
1011011
1100001
```