Road Roles

time limit per test: 2 seconds (5 seconds for Python)
memory limit per test: 500 megabytes
input: standard input
output: standard output
points: 100 · problem code: roadroles

Andy has finished wiring a connected undirected network of n cities with m weighted roads. He now wants to know how each road relates to the Minimum Spanning Trees of the network.

For each road, classify it as one of:

- `forced` — the road appears in **every** MST;
- `optional` — the road appears in **some** MST, but not all;
- `useless` — the road appears in **no** MST.

Input

The first line contains integers n and m.

The following m lines each contain three integers a, b, and c, describing an undirected road between cities a and b with weight c.

Cities are numbered from 1 to n. The graph is connected. Multiple roads between the same pair of cities, and self-loops, are allowed.

Output

Output m lines. The i-th line should contain `forced`, `optional`, or `useless`, the classification of the i-th road in the input.

Constraints

- $1 \le n \le 10^5$
- $n - 1 \le m \le 2 \times 10^5$
- $1 \le a, b \le n$
- $1 \le c \le 10^9$

Example 1

Input

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

Output

```
forced
forced
useless
```

Explanation

The unique MST uses the two lighter roads. The heaviest road can never appear.

Example 2

Input

```
4 5
1 2 1
2 3 1
1 3 1
1 4 2
2 4 2
```

Output

```
optional
optional
optional
optional
optional
```

Explanation

Any two of the weight-1 roads connect cities $1, 2, 3$, and either weight-2 road can finish the tree. No road is required in every MST, and none is useless.