Problem H - Apple Logistics

Daniel is finished harvesting all his apples, and has many many baskets of apples in his warehouses scattered around the city. There are a number of companies who have contracts for apples from Daniel. These companies will come to one of Daniel's warehouses and pick up the apples.

Unfortunately, most of these companies will only go to the closest warehouse to them and they have varying demands, so Daniel constantly needs to move large amounts of apples between warehouses. Daniel has hired the people from ACM practice to drive trucks to move apples between his warehouses. There are some number of roads that connect Daniel's warehouses. Formally, this means that the road system is a graph with vertices that are Daniel's warehouses.

The city has some strange legislations about trucking. Each road has a *capacity*, the maximum number of trucks that are allowable on that road. Roads are constantly being improved, so the capacities of some roads will increase. Occassionally roads are also built and will be available for use with some specified capcity. On the other hand, there are ocassionally complaints about the noise from traffic so the city passes legislation to ban all trucking from that road.

Daniel has a bunch of problems he needs to solve to organize his trucking. Sometimes, because of the lack of suitable trucking roads, it prevents some of his warehouses from reaching all other warehouses. He needs to know how many warehouses are reachable from any given warehouse. He also needs to know the maximum capacity of any single path between any two given warehouses. The maximum capacity of a path is the minimum capacity of any road in the path. Help Daniel with the logistics of his operation.

Input

The first line contains a single integer T, the number of test cases.

Each test case begins with a line containing two integers n, m ($1 \leq n \leq 10,000, 1 \leq m \leq 100,000$) denoting the number of apple warehouses and the number of roads between them initially. m lines follow, each with three integers a, b, c ($1 \leq a, b \leq n$ and $1 \leq c \leq 10^9$) describing a road connecting apple warehouses a and b together, with cargo capacity c. Roads are numbered from 1 to m in the order they appear in test case.

Next will be a line with a single integer e ($1 \leq e \leq 100,000$) denoting the number of events. This will be followed by e lines consisting of a capital letter followed by integers:

- *R r c*: indicates that the road r is expanded, and its capacity *increases* to c
  (road r is guaranteed to be in service prior to this event – i.e. it has been built and is usable, capacity c satisfies $1 \leq c \leq 10^9$ and $c \geq$ the previous capacity of the road)
- *A a b c*: indicates that a new road has been built between apple warehouses a and b, with capacity c
  This road will be numbered sequentially after m. ($1 \leq a, b \leq n, 1 \leq c \leq 10^9$; there is guarateed to be no road in service connecting a and b together previously).
- *D r*: indicates that city legislation has passed that road r cannot be used by trucks.
  (road r is guaranteed to be in service prior to this event).
- *Q a b*: indicates a query for the maximum capacity of any single path between apple warehouses a and b ($1 \leq a, b \leq n$). The *capacity* of a path is the minimum capacity of all roads in the path.
- *C a*: indicates a query to count the number of reachable warehouses from apple warehouses a.

Only the capital letters describe above will appear. All events occur in the order given in the input. There will be at most 2000 events of types R and A combined, and 100 events of type D in each test case; legislation happens very slowly, so not too many roads will be made unavailable.

Output

For each Q a b query, output the capacity of the path of maximum capacity between warehouses a and b. If apple warehouses a and b are not connected by roads currently in service, output -1.

For each C a query, output the number of warehouses reachable from warehouse a (including itself).

Sample Input

```
1
10 9
8 10 1
1 6 5678
7 9 1
2 7 2
4 6 1442
1 7 9812
2 10 10000
6 8 333
1 9 1
32
R 1 1234
Q 7 3
Q 6 10
C 4
A 4 9 3333
Q 1 5
Q 3 5
C 5
Q 9 6
R 4 731923458
Q 2 7
Q 1 10
Q 5 1
A 5 6 5
Q 8 6
C 4
A 1 8 558636001
C 3
Q 5 7
Q 8 6
R 11 321
Q 5 7
Q 10 7
D 7
D 11
Q 10 2
Q 4 5
A 3 4 2
R 13 10000
Q 3 6
C 3
C 5
```

Sample Output

```
-1
333
8
-1
-1
1
1442
731923458
9812
-1
1234
9
1
5
5678
321
10000
1234
-1
1442
9
1
```